Biomek® FX and FX^P Laboratory Automation Workstations

Quick-Start Guide

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1 Introducing the Biomek® FX Laboratory Automation Workstation

1.1 Introduction

Note: Unless otherwise noted, all information in this quick-start guide refers to both the Biomek® FX and FX^P instruments.

Welcome to the Biomek® FX Laboratory Automation Workstation.

This quick-start guide is designed to help you learn to use Biomek Software with your Biomek FX. This quick-start guide includes:

- *Introducing the Biomek® FX Laboratory Automation Workstation* (this chapter) — a general hardware overview on the Biomek FX Laboratory Automation Workstation and introduction to the Biomek Software.
- *Learning to Create Methods for the Biomek® FX* (Chapter 2) — an overview on how to create methods using the Biomek Software.
- *Using the Editors While Creating Methods* (Chapter 3) — an overview on how to use the editors in Biomek Software to accommodate unique method requirements.

1.1.1 How to Use This Quick-Start Guide

This quick-start guide is intended to help you start using the Biomek FX instrument and Biomek Software immediately. Read through this first chapter to acquaint yourself with the system, proceed to Chapter 2 and complete the tutorial steps for building a small method, then use Chapter 3 to complete the tutorial steps for using the editors for customizing a method.

To understand the depth of operating opportunities designed into this system, as well as to familiarize yourself with the suite of comprehensive user's manuals made available at installation, links are provided throughout this guide to specific sections in the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual*, the *Biomek Software User's Manual*, and the *ALPs User's Manual*.

In addition to the explanations, graphics, and links to other sources, you will see other useful information in the following forms:

Definition

These boxes contain brief definitions of material that may be specific to the Biomek FX, or generally unfamiliar.

Important Concept

These boxes emphasize important concepts relevant to the Biomek FX instrument and the Biomek Software. Refer to the links in this quick-start guide or the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual* or the *Biomek Software User's Manual* for more information on these important concepts.

1.2 Biomek® FX

The Biomek FX (Figure 1-1) is a multiaxis liquid-handling instrument used in the laboratory. Its open-architecture design, along with the extensible operating software, provides a foundation for integrating current and future specific-use components.

The Biomek FX may have one or two pods and a variety of operating components, such as heads, ALPs, and third party devices. Regardless of pod configuration or operating components, your Biomek FX is controlled through Biomek Software.

A light curtain and other protective barriers are standard with your Biomek FX (refer to Section 1.2.3, *Light Curtain and Other Protective Barriers*).

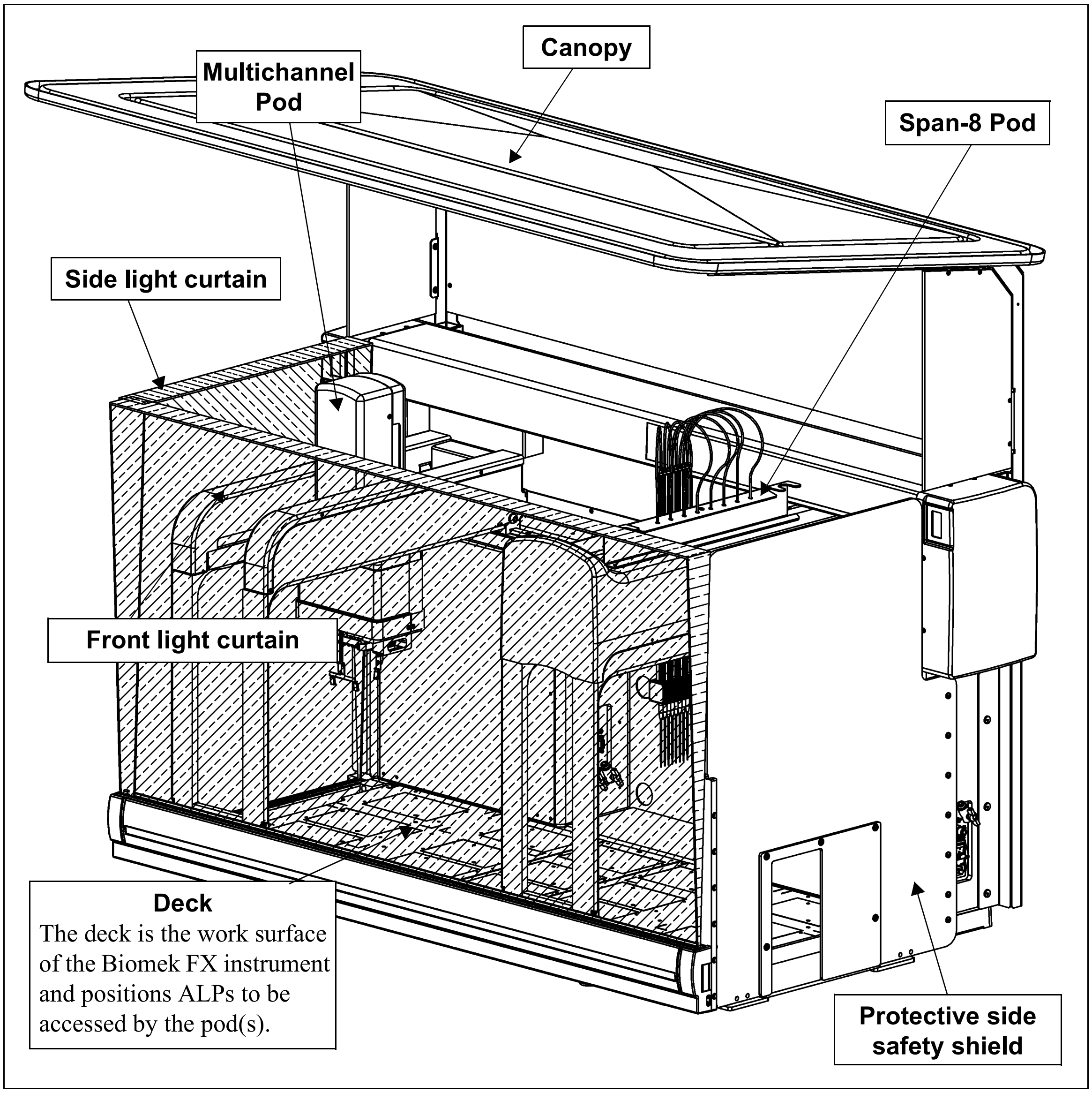


Figure 1-1. Biomek FX main components

1.2.1 Pods and Heads

There are two types of pods available for the Biomek FX:

- Multichannel Pod — holds various removable and interchangeable heads, such as the 96-Channel 200 µL Head, that perform liquid-handling operations, and a gripper for labware movement operations.

  Note: Refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual,* Chapter 2, *Multichannel Pod*, for detailed information on the Multichannel Pod and interchangeable heads.

- Span-8 Pod — holds a series of eight probes that perform liquid-handling operations independent of each other.

  Note: Refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual,* Chapter 3, *Span-8 Pod*, for detailed information on the Span-8 Pod.

Heads

Interchangeable heads aspirate and dispense liquid using disposable tips. The tip compatibility and the maximum volume that may be aspirated and dispensed with those tips varies for each head.

Probes

Probes move and pipette independently in the D- and Z- axes and hold the interface for fixed or disposable tips, both Liquid Level Sensing (LLS) capable and non-LLS capable, used to perform liquid-handling operations.

1.2.2 Automated Labware Positioners (ALPs)

Automated Labware Positioners (ALPs) are removable and interchangeable platform structures that are installed on the Biomek FX deck to allow automated assays to be performed.

ALPs are either active or passive:

- *Passive ALPs* hold labware in place on the deck or act as receptacles for by-products from methods, such as system fluid and disposed tips, tip boxes, and labware.
- *Active ALPs* contain mechanisms that may use power and/or air sources for mechanical operation, such as tip loading, tip washing, mixing/stirring, shaking, and precisely positioning labware.

Note: Refer to the *ALPs User's Manual* for detailed information on the ALPs on your system.

1.2.3 Light Curtain and Other Protective Barriers

⚠ **WARNING: To reduce the risk of personal injury, safety shields and light curtain must be in place before operating. The safety shields and light curtain prevent entry into the work area during machine movement.**

⚠ **WARNING: Dark non-reflective material affects the sensitivity of the light curtain and adversely impact its effectiveness. Typical lab dress, such as lab coats and latex gloves, do not degrade light curtain operation; however, it is advisable to test the impact of all lab attire on light curtain sensitivity before operating the Biomek FX.**

The Biomek FX is equipped with protective barriers:

- Front light curtain
- Side protective shields

  OR

  Side light curtains
- Overhead canopy

When an object larger than approximately 1" in diameter penetrates this protective zone, the instrument shuts down immediately, stopping all pod and head operations. Some ALP operations, such as shaking or stirring, continue (refer to the ALPs User's Manual). When the instrument is sitting idle or in the paused mode, no violations are registered when the protective zone is penetrated.

1.3 Biomek Software

Biomek Software is designed to:

- Do a substantial amount of the method-building work for you.
- Allow you to take as much direct and precise control over the method-building process as you want.

Method

A method is a series of steps controlling the operations of your Biomek.

The main editor that appears when the software is launched (Figure 1-2) is used to build and configure methods:

- Each step is dragged and dropped from a Step Palette into the Method View (refer to Chapter 2, *Learning to Create Methods for the Biomek® FX*).
- When a step in the Method View is highlighted, the corresponding configuration options appear in the Step Configuration Area (refer to Chapter 2, *Learning to Create Methods for the Biomek® FX*).
- The method is customized to the desired level of precise control via the editors accessed from the Project and Instrument menus (refer to Chapter 3, *Using the Editors While Creating Methods*).

Step Palettes

Step Palettes are panes in the Biomek main editor showing steps available for insertion in a method. They are located on the left of the main editor. Use the Step Palette Builder to add other step palettes. Refer to the *Biomek Software User's Manual*, Chapter 30.5, *Using the Step Palette Builder* for more information.

1.4 Starting the Biomek® FX

Accounts & Permissions

When enabled, Accounts & Permissions is an integrated set of features built into the software to assist users in complying with electronic signature requirements for closed systems. The functionality for Accounts & Permissions is included in the Biomek Software installation and provides control over who can create and run methods, and who may only run validated methods. Refer to the *Biomek Software User's Manual*, Chapter 2, *Using Accounts & Permissions*.

To start the Biomek FX, you will follow the instructions in this chapter to turn on the instrument, launch the Biomek Software, and home all axes.

1.4.1 Turning On the Biomek FX

To turn on the Biomek FX instrument:

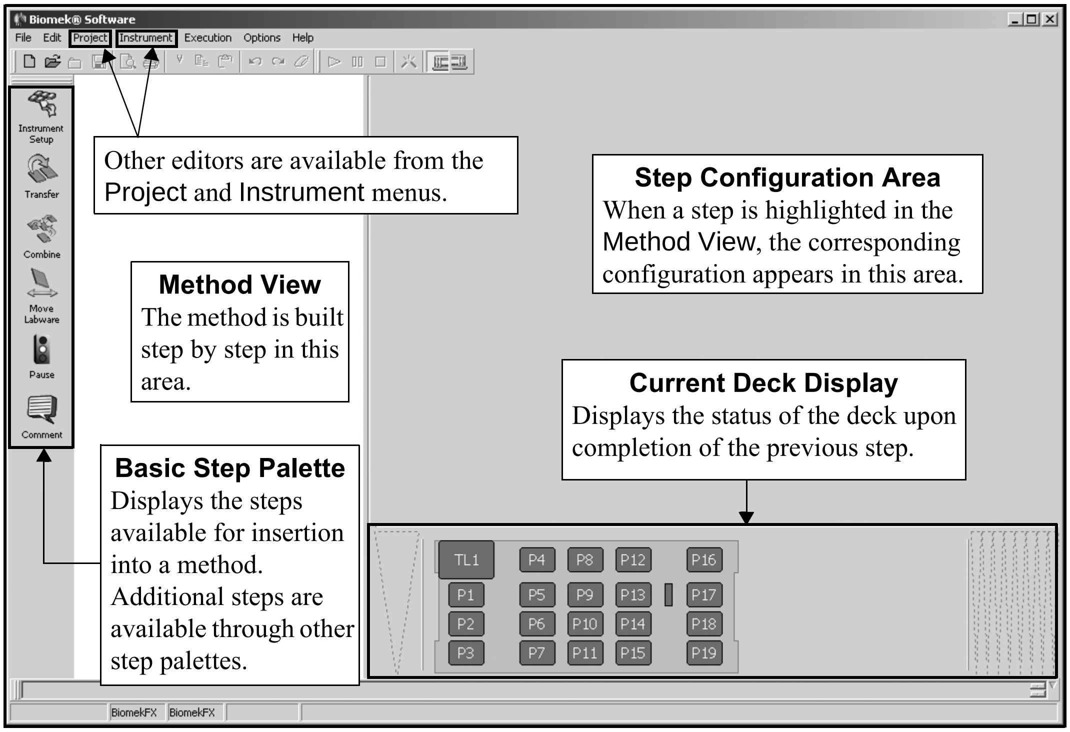
1. Locate the power switch on the right side of the instrument (Figure 1-2).
2. Flip the switch to the On position. The indicator light comes on in solid green.

1.4.2 Launching the Software

To launch the Biomek Software:

1. Choose **Start>All Programs>Beckman Coulter>Biomek Software**.
2. If Accounts & Permissions is enabled (see sidebar), a dialogue box appears requesting you to log in using the user name and password assigned to you by your system administrator. Enter the required information. Your account must have Develop Methods, Develop Projects, and Setup Instrument permissions to complete all parts of this quick-start guide. The Biomek Software main editor appears (Figure 1-2).

Note: If you are logging into Biomek Software for the first time, you must enter a new password. Remember your new password; you will need to enter it each time you access Biomek Software.



Other editors are available from the Project and Instrument menus.

Step Configuration Area
When a step is highlighted in the Method View, the corresponding configuration appears in this area.

Method View
The method is built step by step in this area.

Current Deck Display
Displays the status of the deck upon completion of the previous step.

Basic Step Palette
Displays the steps available for insertion into a method. Additional steps are available through other step palettes.

Figure 1-2. Biomek Software main editor

1.4.3 Homing All Axes of the Biomek FX Pod

Every time the Biomek FX is turned on, you’ll have to Home All Axes. This automatic process initiates the pod and defines the home position from which all subsequent moves are determined.

To home all axes:

1. From the Instrument menu, choose **Home All Axes**. A Warning appears.
2. Make sure that all warnings are addressed and choose **OK**. The pod is homed and the instrument is now ready for use.

Proceed through this quick-start guide while using the links to the user’s manuals to learn more about the Biomek FX liquid-handling system.

2 Learning to Create Methods for the Biomek® FX

2.1 Overview

In this chapter you will be given information and instructions for building a small method using Biomek Software. A method is a series of steps that control the operation of your Biomek FX.

The method you complete in this chapter represents basic operations and is intended simply to familiarize you with the Biomek FX, and to create a basic understanding of method-building opportunities.

Read the information in this chapter and complete the tutorial steps provided. After you have completed the instructions, or if you need additional information along the way, use the links provided to access the suite of user's manuals provided during installation. These manuals include *Biomek Software User's Manual*, *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual*, and *ALPs User's Manual*. Each manual contains comprehensive information about the possibilities designed into the Biomek FX.

In this chapter, you'll learn:

- *Creating a New Method* (Section 2.2)
- *Configuring the Instrument Setup Step* (Section 2.3)
- *Configuring a Transfer Step for Multichannel Pod* (Section 2.4)
- *Configuring a Combine Step for Span-8 Pod* (Section 2.5)
- *Configuring a Move Labware Step* (Section 2.6)
- *Using the Finish Step* (Section 2.7)
- *Saving a Method* (Section 2.8)
- *Running a Method* (Section 2.9)

2.2 Creating a New Method

If using Accounts & Permissions . . .
You must have Develop Methods permission to create methods. Refer to the *Biomek Software User's Manual*, Chapter 2, *Using Accounts & Permissions*, for more information.

Tip Loader
The Tip Loader ALP loads disposable tips onto a 96-well head or a 384-well head mounted on a Multichannel Pod. Refer to the *ALPs User's Manual*, Chapter 23, *Tip Loader ALP*, for more information.

In this chapter, you will build a simple method that transfers liquid between labware. In building this method, you will:

- Populate the deck with labware using the Instrument Setup step.
- Transfer liquid with a Multichannel Pod using a Transfer step.

Note: Using the Multichannel Pod requires that a *Tip Loader ALP* is installed on the deck.

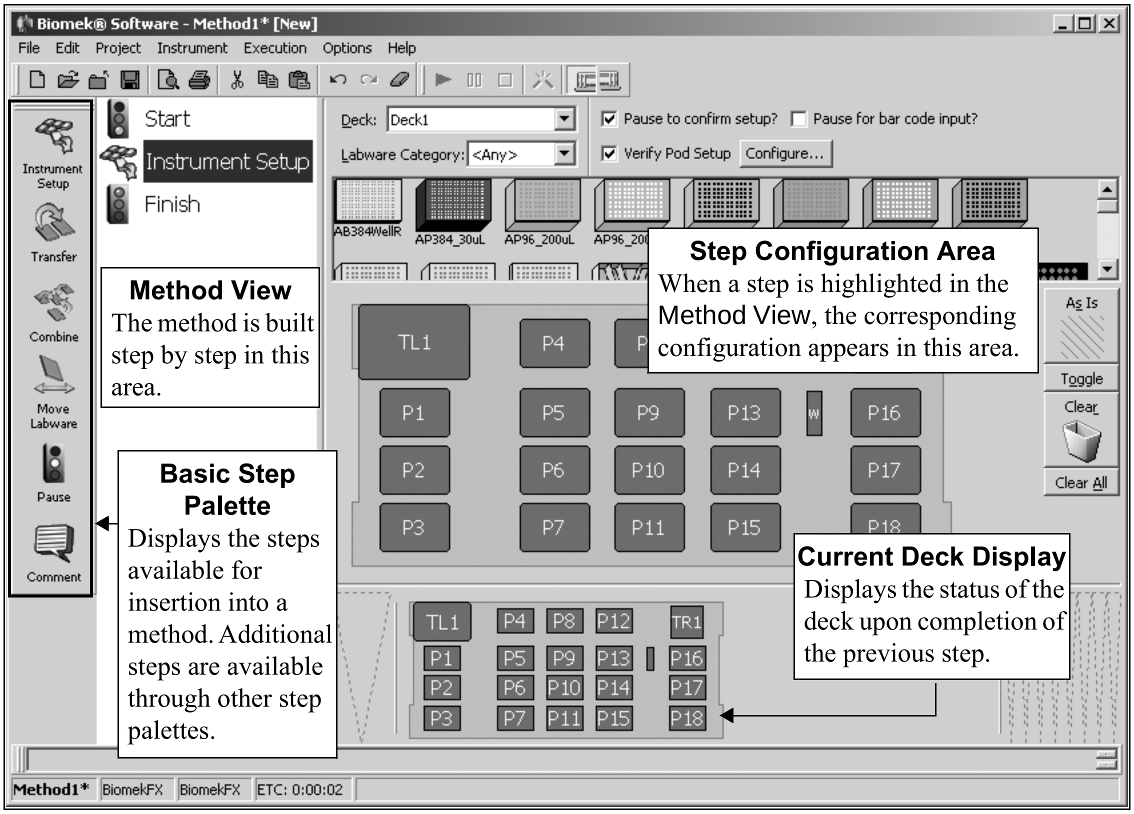
- Transfer liquid with a Span-8 Pod using a Combine step.

Note: Using the Span-8 Pod requires that a Span-8 Tip Wash ALP is installed on the deck. A Span-8 Disposal ALP—called TipTrash in the Deck Editor—is required if using disposable tips.

- Move labware with the gripper on the Multichannel Pod using a Move Labware step.

You launched Biomek Software in Chapter 1. You are now going to create a small method:

Drag and drop an Instrument Setup into the Method View. A new method is created and assigned the default name Method1 [New] (Figure 2-1).



Deck: Deck1

Labware Category: <Any>

☑ Pause to confirm setup? ☐ Pause for bar code input?

☑ Verify Pod Setup Configure...

Method View
The method is built step by step in this area.

Basic Step Palette
Displays the steps available for insertion into a method. Additional steps are available through other step palettes.

Step Configuration Area
When a step is highlighted in the Method View, the corresponding configuration appears in this area.

Current Deck Display
Displays the status of the deck upon completion of the previous step.

Figure 2-1. Biomek Software main editor for dual-pod Biomek FX instrument

As you can see, two steps automatically appear in every method created and executed by the Biomek Software:

- Start — the first step in a method; allows creation of global *variables* that are applicable to the entire method. Refer to the *Biomek Software User's Manual,* Chapter 13.2.1, *Configuring the Start Step*, for information on creating variables in the Start step.

- Finish — the final step in a method; provides options to clear the Biomek FX deck, clear the devices on the deck, unload tips from the pod, and clear all global variables. Refer to the *Biomek Software User's Manual*, Chapter 13.2.2, *Configuring the Finish Step*, for information on configuring other options for the Finish step.

Variables

A variable is a value that has been assigned a name. that may be referenced repeatedly during a method. Refer to the *Biomek Software User's Manual,* Chapter 14, *Using Variables and Expressions in a Method* for more information.

Proceed to Section 2.3, *Configuring the Instrument Setup Step* to learn how to configure the Instrument Setup step you just inserted into the method view.

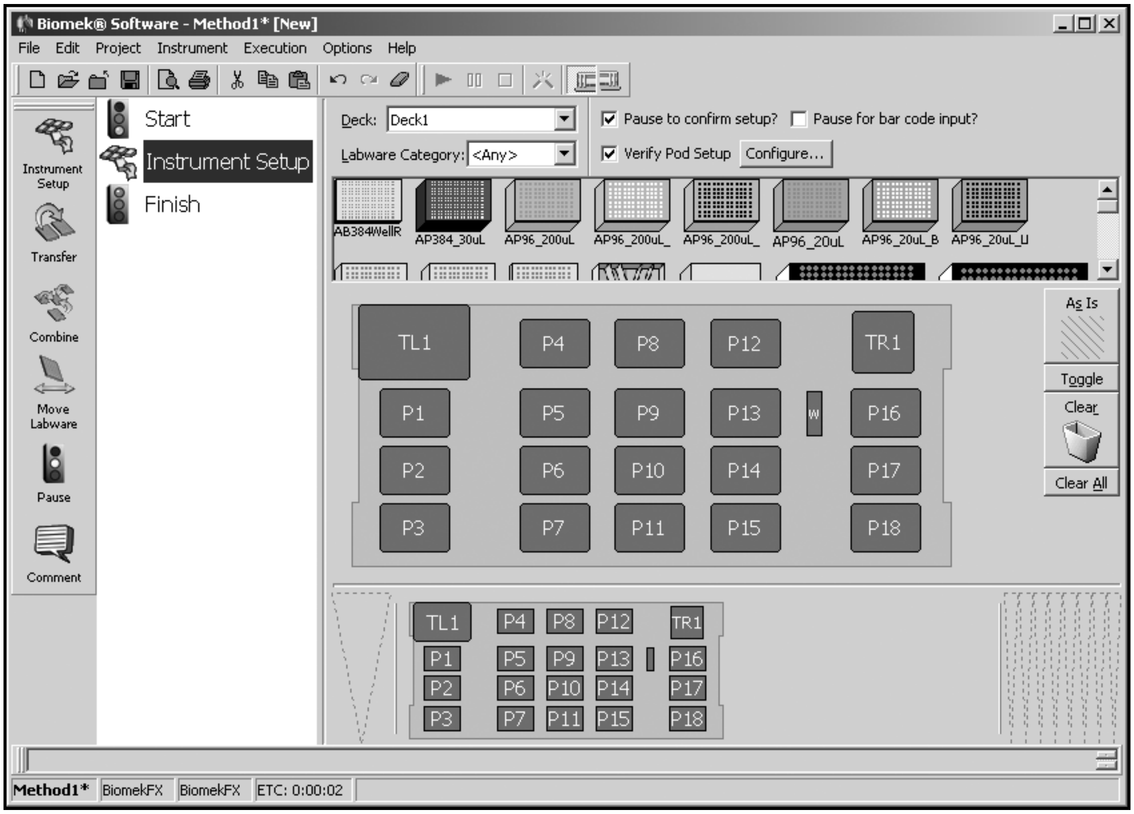
2.3 Configuring the Instrument Setup Step

CAUTION: An inaccurate Instrument Setup may result in pod and labware collisions, or in inappropriate pipetting.

When creating Biomek methods, it is important for obstacle avoidance (see sidebar) to use the Instrument Setup step, along with the Deck Editor, to tell the software what labware and ALPs are on the deck. You'll learn more about the Deck Editor in the next chapter (refer to Section 3.5, *Creating a New Deck*).

Obstacle Avoidance

When building a method, you must ALWAYS use the Deck Editor and Instrument Setup step to tell the software what labware and ALPs are on the deck and the position each occupies. If this is not done, the pod could collide into these objects as it moves around the deck during a method.



Deck: Deck1

Labware Category: <Any>

☑ Pause to confirm setup? ☐ Pause for bar code input?

☑ Verify Pod Setup

Figure 2-2. Instrument Setup step in the Method View

To configure the Instrument Setup step for your new method:

CAUTION: Do not place labware other than a tip box on a tip loader position (TL#).

1. In Deck, make sure the default deck layout (Deck1) is selected. The Instrument Setup step uses a deck layout as a map for the placement of labware, ALPs, and external hardware devices, such as stacker carousels.
2. Drag and drop the following labware on the Deck Layout Display:
   - an **AP96_200uL** to TL1
   - a **Reservoir** to P4
   - a **BCFlat96** to P5
   - an **AP96_200uL_LLS** to P16; the LLS means these are conductive tips that enable *liquid level sensing* on a Span-8 Pod.
   - a **Costar384FlatSquare** to P12. Your screen should look like Figure 2-3.

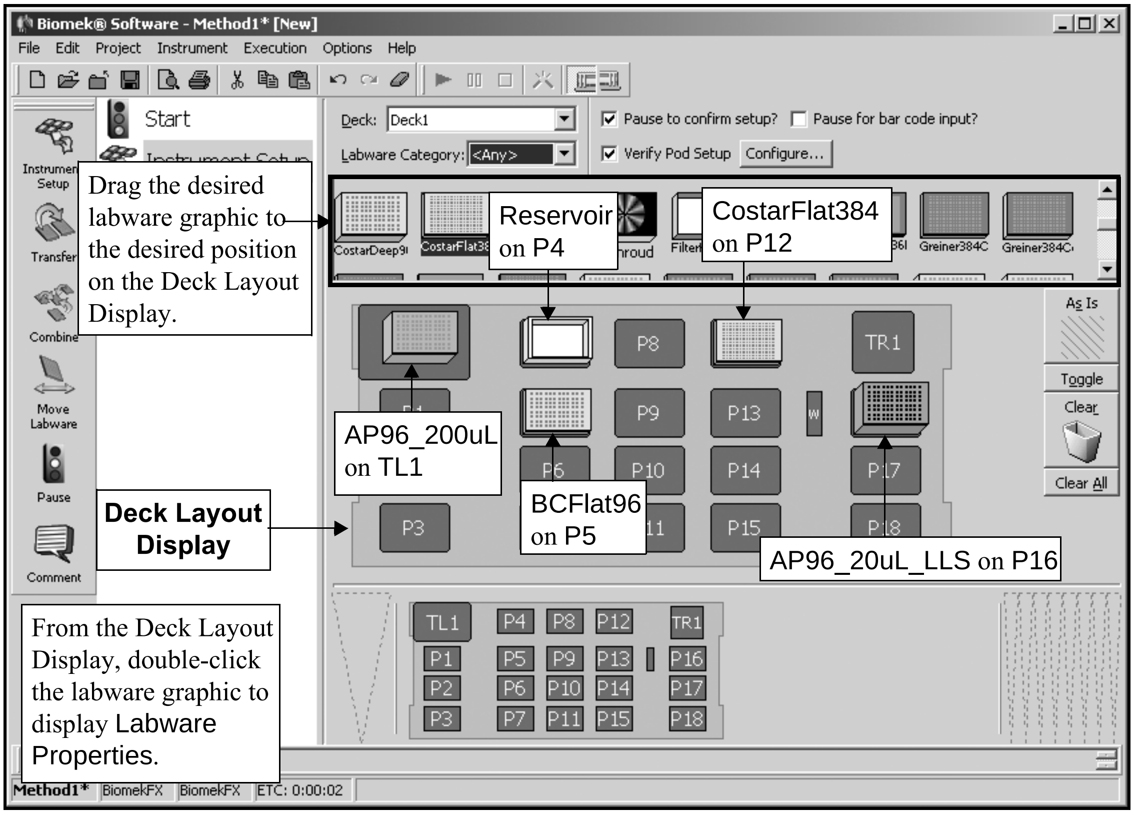
Note: To remove unwanted labware from the Deck Layout Display during setup, drag and drop the labware to the **Clear** (trash) icon.

Creating Labware

If you want to use a labware type that does not appear in the available labware list, use the Labware Type Editor to create a new labware type. In Section 3.3, *Creating New Labware in the Labware Type Editor*, you will create a new labware type in the Labware Type Editor.

Liquid Level Sensing

Liquid Level Sensing (LLS) is used to determine the liquid level within a piece of labware using specially designed LLS tips. Refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual*, Chapter 3.3.1,

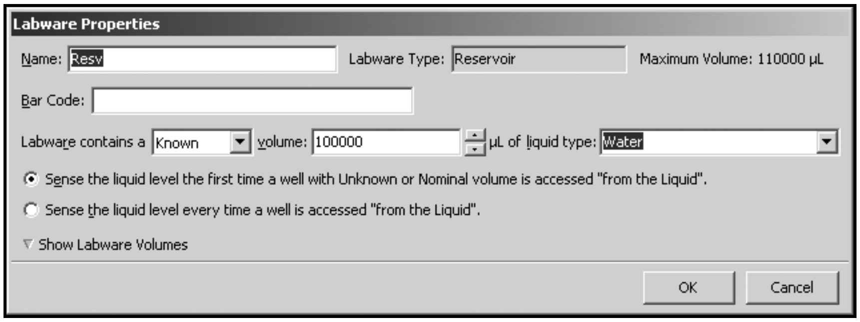


Drag the desired labware graphic to the desired position on the Deck Layout Display.

From the Deck Layout Display, double-click the labware graphic to display Labware Properties.

Figure 2-3. Instrument Setup step with labware added

3. From the Deck Layout Display, double-click the reservoir on P4 to display Labware Properties (Figure 2-4).


Labware Properties

Name: Resv   Labware Type: Reservoir   Maximum Volume: 110000 µL

Bar Code:

Labware contains a Known volume: 100000 µL of liquid type: Water

● Sense the liquid level the first time a well with Unknown or Nominal volume is accessed "from the Liquid".

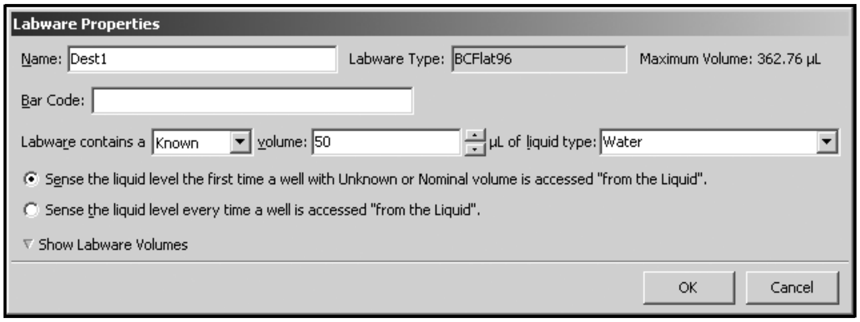
○ Sense the liquid level every time a well is accessed "from the Liquid".

Figure 2-4. Labware Properties for Reservoir on P4

Naming Labware

It is helpful to name labware, particularly when you use lots of labware on the deck. You can assign a name that identifies the contents of the labware or a descriptive name that fits the work being done in the laboratory. Naming labware can reduce confusion.

4. In Name, enter **Resv** in Labware Properties.
5. In Labware contains, select **Known** from the pull-down menu.
6. In volume, enter **100000**. This means that you know you have 100000 microliters of liquid in the reservoir.
7. In liquid type, select **Water** from the pull-down menu. Labware Properties for the Reservoir should look like Figure 2-4.
8. Choose **OK** to close Labware Properties.
9. Double-click the labware on P5 and name it **Dest1** in Labware Properties.
10. In Labware contains, select **Known**.
11. In volume, enter **50**. Labware Properties for the labware on P5 should look like Figure 2-5.
12. In liquid type, select **Water** from the pull-down menu. Labware Properties for the BCFlat96 should look like Figure 2-5.
13. Choose **OK** to close Labware Properties.


Labware Properties

Name: Dest1   Labware Type: BCFlat96   Maximum Volume: 362.76 µL

Bar Code:

Labware contains a Known volume: 50 µL of liquid type: Water

● Sense the liquid level the first time a well with Unknown or Nominal volume is accessed "from the Liquid".

○ Sense the liquid level every time a well is accessed "from the Liquid".

Figure 2-5. Labware Properties for Dest1

14. Double-click the labware on P12 and name it **Dest_S8** in Labware Properties.

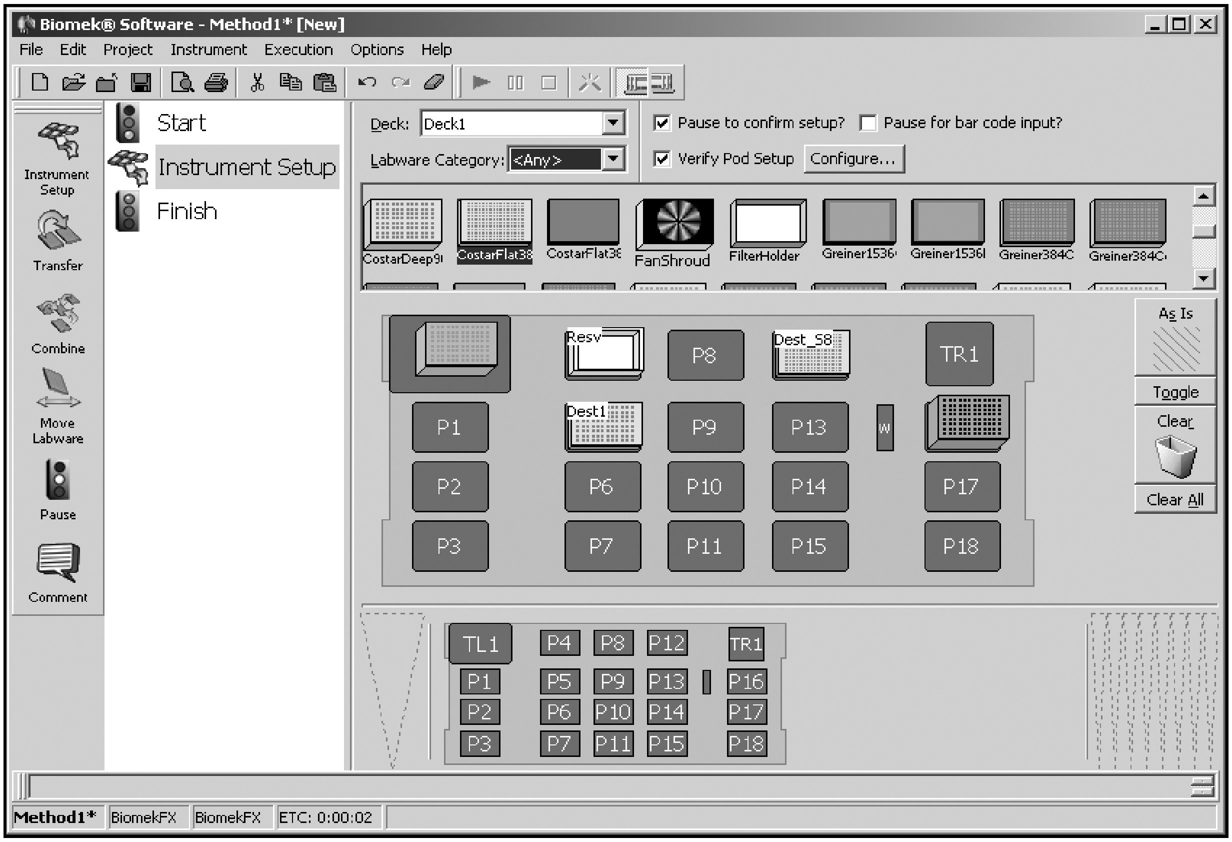
15. In Labware contains, select **Unknown**.
16. Choose **OK** to close Labware Properties.

Note: The default settings in Labware Properties will be used for the two tip boxes; however, you can refer to the *Biomek Software User's Manual*, Chapter 16.2.5.1, *Configuring Labware Properties for Tips*, to learn more about configuring a tip box.

17. Select **Pause to confirm setup?**. You will see a confirmation prompt when you run your method in Section 2.9, *Running a Method*.
18. Leave the **Verify Pod Setup** option as is. This setup is used to inform the software of the current state of the pod; for example, if the pod already has tips loaded.

Your Instrument Setup step is now configured and the main editor should look like Figure 2-6.

Note: To learn more about the Instrument Setup step, refer to the *Biomek Software User's Manual*, Chapter 16.2, *Instrument Setup Step*.



Deck: Deck1

Labware Category: <Any>

☑ Pause to confirm setup? ☐ Pause for bar code input?

☑ Verify Pod Setup

Figure 2-6. Instrument Setup step with labware named

Next you will configure a Transfer step using a Multichannel Pod and a Combine step using a Span-8 Pod. If your Biomek FX instrument has only one pod, you only need to complete the section for the pod configuration of your instrument; however, if you have a dual-pod system with a Multichannel Pod and a Span-8 Pod, you may find it useful to complete both sections to get to know the differences between the two pods.

2.4 Configuring a Transfer Step for Multichannel Pod

Transfer Step

A Transfer step loads tips, aspirates and dispenses liquid, and unloads tips. This eliminates the need to insert four separate steps to complete a liquid transfer. However, there are steps in Biomek Software that allow these steps to be performed individually with a Multichannel Pod on the Intermediate Step Palette (refer to the *Biomek Software User's Manual,* Chapter 17, *Using the Intermediate Step Palette*).

If your instrument does not have a Multichannel Pod, skip this section and continue to the next.

The Transfer step transfers liquid from a single source to one or more destinations. You are going to insert and configure a Transfer step using the Multichannel Pod into the method to transfer liquid from the Source reservoir to the Destination microplate.

Note: For information on the extensive selections available for configuring the Transfer step, refer to the *Biomek Software User's Manual,* Chapter 16.3, *Configuring Transfer and Combine Steps*.

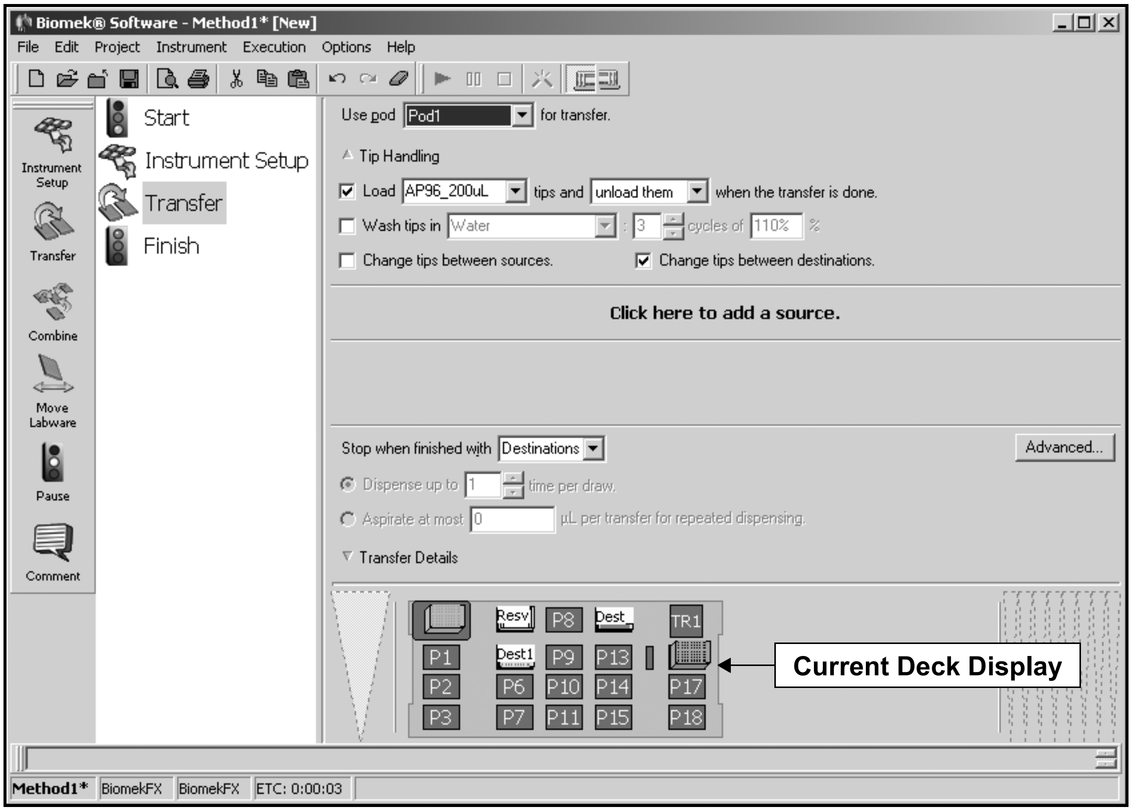
2.4.1 Inserting a Transfer Step

To insert a Transfer step into your method:

Drag and drop a **Transfer** step from the Step Palette into the Method View just below the Instrument Setup step. Notice that the Current Deck Display shows the current position of all labware on the deck (Figure 2-7).

You'll complete three sections to configure the Transfer step for this method:

- Section 2.4.2, *Configuring Tip Handling*
- Section 2.4.3, *Configuring Source Labware*
- Section 2.4.4, *Configuring Destination Labware*



Use pod Pod1 for transfer.

Tip Handling

☑ Load AP96_200uL tips and unload them when the transfer is done.

☐ Wash tips in Water : 3 cycles of 110%

☐ Change tips between sources. ☑ Change tips between destinations.

Click here to add a source.

Stop when finished with Destinations

Advanced...

○ Dispense up to 1 time per draw.

○ Aspirate at most 0 µL per transfer for repeated dispensing.

Transfer Details

Current Deck Display

Method1* BiomekFX BiomekFX ETC: 0:00:03

Figure 2-7. Transfer step inserted into the Method View

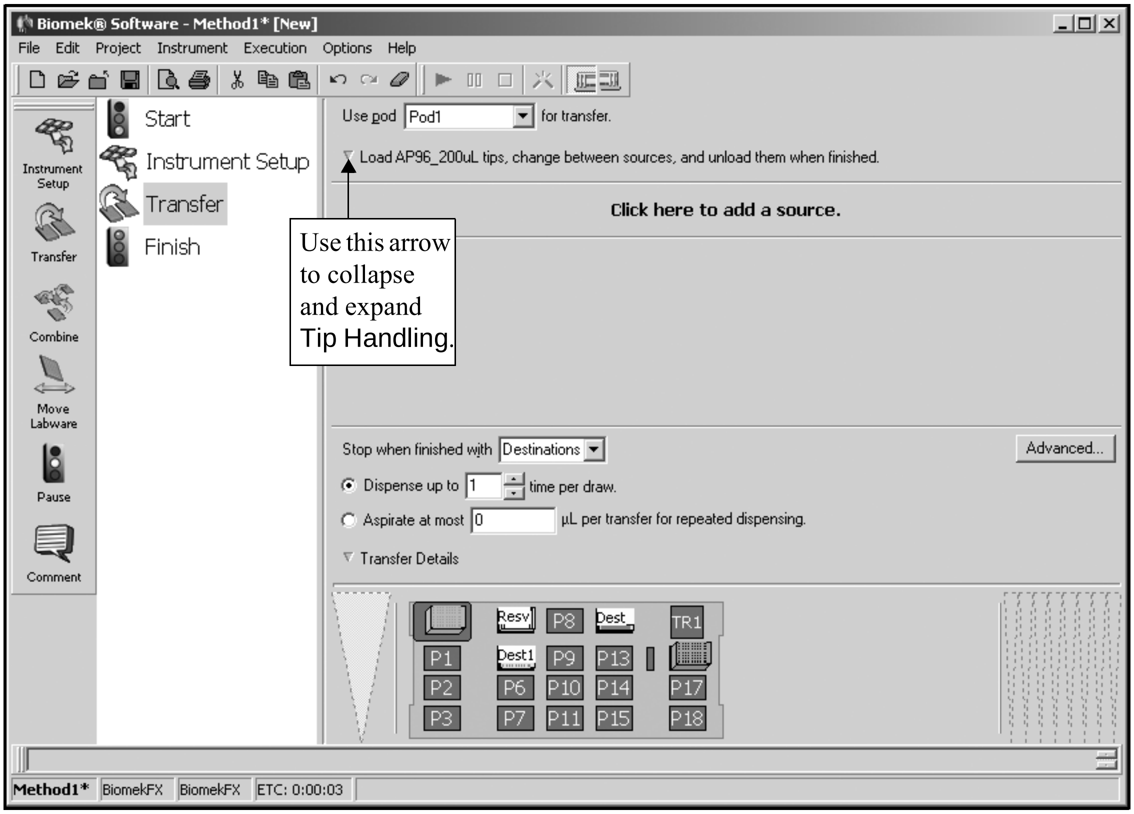
2.4.2 Configuring Tip Handling

Tip Handling

Configuring Tip Handling is not always required because the Biomek FX locates and loads clean tips automatically during a Transfer step. Refer to the *Biomek Software User's Manual*, Chapter 16.3.1, *Configuring Tip Handling*, for information on other tip handling options, such as Wash tips in and Change tips between destinations.

To configure tip handling:

1. Make sure a Multichannel Pod is selected in Use pod. If your instrument has two pods, the left pod is **Pod1** and the right pod is **Pod2**.
2. In Tip Handling, make sure **Load** is checked
3. Click on the **AP96_200uL** tip box on TL1 in the Current Deck Display to load AP96_200µL tips as part of the Transfer step.
4. Make sure **unload them** is selected in the next field.
5. Check **Change tips between sources**.
6. Uncheck **Change tips between destinations**.
7. Your tips are configured for your liquid transfer, so click the **up arrow** next to Tip Handling to collapse the configuration. This allows more room for the step configuration (Figure 2-8).



Use pod Pod1 for transfer.

Load AP96_200uL tips, change between sources, and unload them when finished.

Click here to add a source.

Stop when finished with Destinations

● Dispense up to 1 time per draw.

○ Aspirate at most 0 µL per transfer for repeated dispensing.

Transfer Details

Use this arrow to collapse and expand Tip Handling.

Figure 2-8. Transfer step with Tip Handling collapsed

2.4.3 Configuring Source Labware

To configure the labware named Resv as source labware in the Transfer step:

1. Click on **Click here to add a source**.
2. Click on **Resv** labware sitting on P4 in the Current Deck Display.

> **Note:** The information you supplied during Instrument Setup is displayed in the source labware configuration.

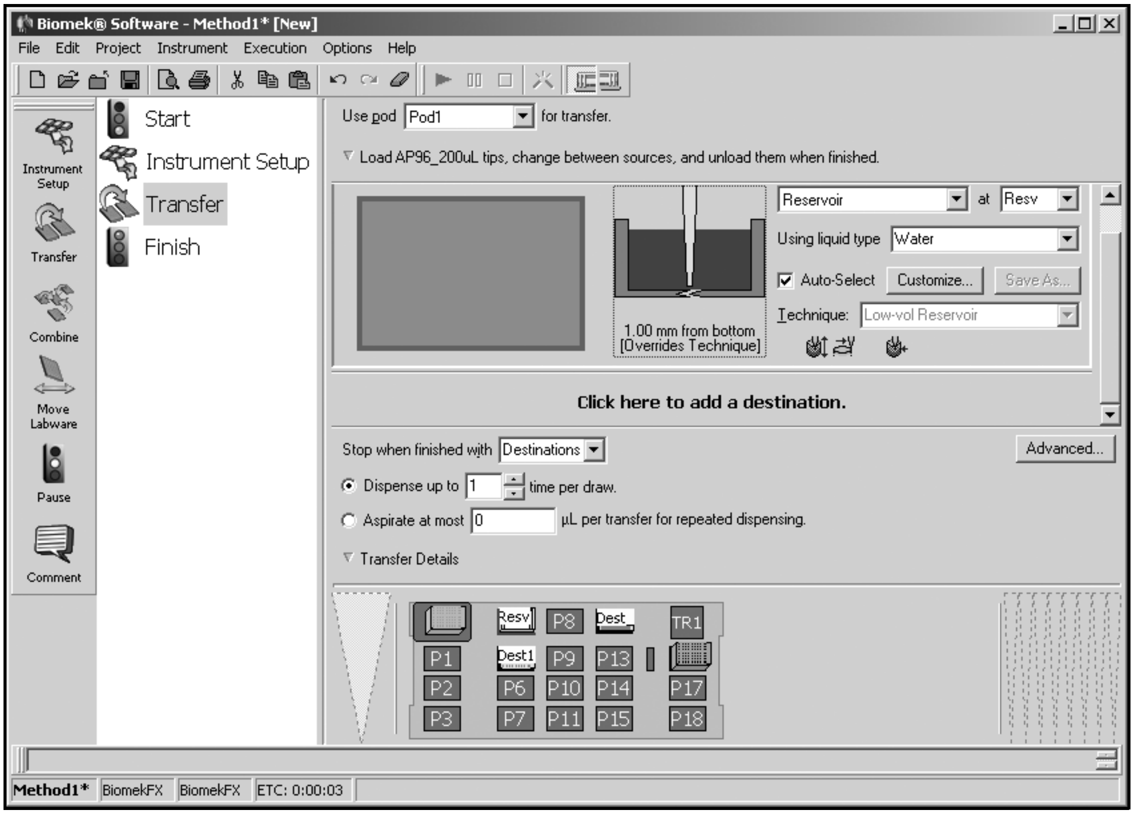
3. Leave the **Auto-Select** checkbox selected to use the technique selected by Biomek Software.
4. Right-click on the large tip illustration next to the microplate graphic in the configuration and choose **Measure from the Bottom**.
5. To adjust and set the aspirate height for the depth the tip descends into the reservoir, place the **mouse cursor over the tip illustration**. When the cursor turns into a hand, hold the left mouse button down to move the hand up and down until the depth is as close to **1.00 mm from bottom** as you can get. Then adjust the height precisely to 1.00 mm using the following note. This will be your aspirate height for this transfer.

> **Note:** After you click on the tip, you can adjust the height more precisely by using the up or down arrow keys on your keyboard while holding the Alt key. You can also right-click on the graphic, then select from the menu that appears to adjust the height.

The source labware configuration is complete and the main editor now looks like Figure 2-9.

Techniques

Techniques allow pipetting settings to be saved globally and used in any method. Biomek Software includes several predefined techniques. If Auto-Select is chosen in a pipetting step, such as Transfer, each time a method is created, Biomek Software automatically selects the technique most appropriate for the pipetting operation.


Use pod Pod1 for transfer.

Load AP96_200uL tips, change between sources, and unload them when finished.

Reservoir at Resv

Using liquid type Water

☑ Auto-Select

Technique: Low-vol Reservoir

1.00 mm from bottom [Overrides Technique]

Click here to add a destination.

Stop when finished with Destinations

● Dispense up to 1 time per draw.

○ Aspirate at most 0 µL per transfer for repeated dispensing.

Transfer Details

Figure 2-9. Transfer step with source labware configured

2.4.4 Configuring Destination Labware

Transfer Details

Transfer details with a Multichannel Pod include a stop condition for transfer operations; a repeat pipetting configuration; and a maximum tolerance in timing between transfer operations. Refer to the *Biomek Software User's Manual,* Chapter 16.3.4, *Configuring Transfer Details*.

To configure the labware named Dest1 as destination labware in the Transfer step:

1. Before you configure the destination labware, click the down arrow in Transfer Details located just above the Current Deck Display to collapse that section. You will not be making any changes to the options in this section.
2. Click on **Dest1** sitting on P5 in the Current Deck Display. This one operation accomplishes the same task as steps 1 and 2 of Section 2.4.3, *Configuring Source Labware*.)

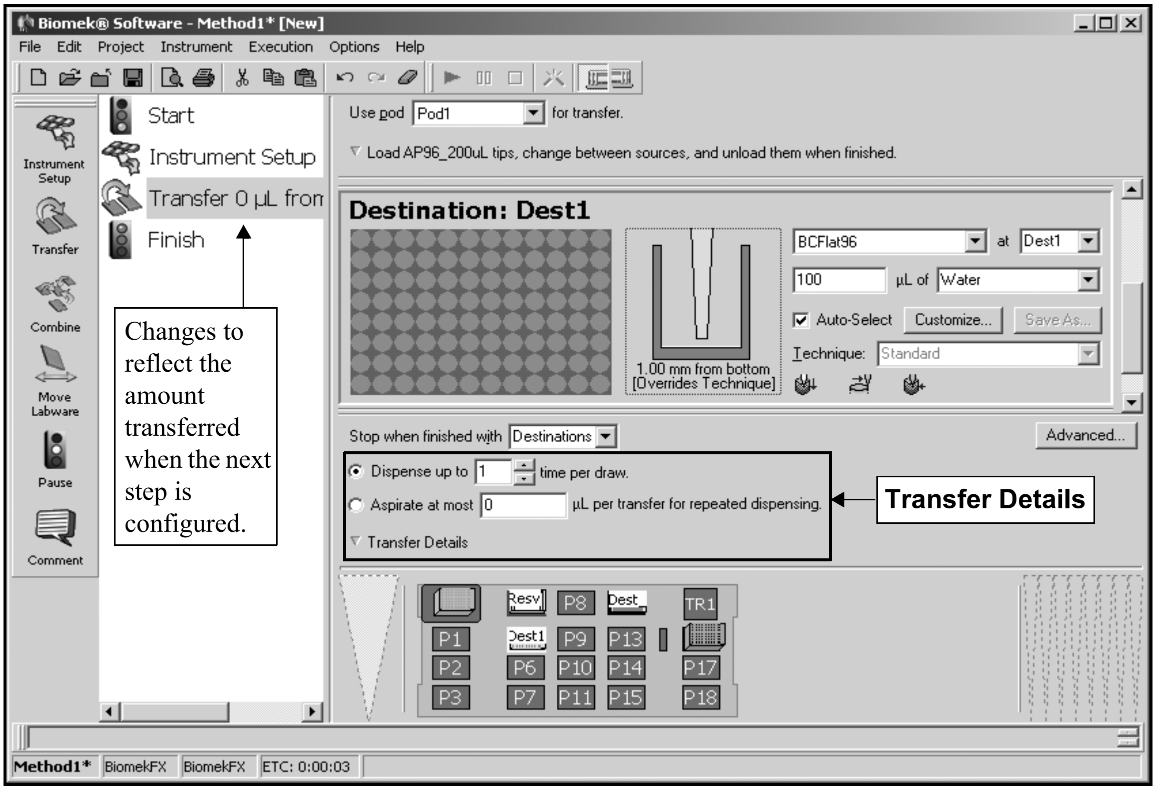
Note: Notice that the source labware configuration is collapsed and replaced with a text summary of the setup. If you want to reopen the source configuration, click anywhere in the collapsed area.

3. The Volume field is highlighted, which allows you to designate the amount of liquid to be dispensed. For this tutorial, you're transferring 100 µL; so, type **100** into the Volume field.

Note: The volume is measured in microliters (µL) automatically and indicates the amount of liquid that will be dispensed (100 µL) into each of the 96 wells.

4. Right-click on the large tip illustration and choose **Measure from Bottom**.
5. Set the dispense height in the large tip illustration to **1.00 mm from bottom**, using the same technique as you used for setting the aspirate height. The destination labware is now configured, and the editor looks like (Figure 2-10).

The Transfer step configuration is now complete. In the next section, you will configure a Combine step to transfer liquid using a Span-8 Pod. If your instrument does not have a Span-8 Pod, skip to Section 2.6, *Configuring a Move Labware Step*, to learn how to move labware using the gripper on the Multichannel Pod.



Use pod Pod1 for transfer.

Load AP96_200uL tips, change between sources, and unload them when finished.

Destination: Dest1

BCFlat96 at Dest1

100 µL of Water

☑ Auto-Select

Technique: Standard

1.00 mm from bottom [Overrides Technique]

Stop when finished with Destinations

● Dispense up to 1 time per draw.

○ Aspirate at most 0 µL per transfer for repeated dispensing.

Transfer Details

Changes to reflect the amount transferred when the next step is configured.

Transfer Details

Figure 2-10. Transfer step with Destination configured

Note: The method view changes to reflect the amount transferred when the next step is configured.

2.5 Configuring a Combine Step for Span-8 Pod

Combine Step

A Combine step loads tips, aspirates and dispenses liquid, and unloads tips. This eliminates the need to insert four separate steps to complete a liquid transfer. However, there are steps in Biomek Software that allow these steps to be performed individually with a Span-8 Pod on the Span-8 Step Palette (refer to the *Biomek Software User's Manual,* Chapter 19, *Using the Span-8 Step Palette*).

If your instrument does not have a Span-8 Pod, skip this section and continue to the next.

The Combine step transfers liquid from one or more sources to a single destination. You are going to insert and configure a Combine step using a Span-8 Pod into the method to transfer liquid from the Source 96-well microplate to the upper left quadrant of the Destination 384-well microplate using the Combine step.

Note: For information on the extensive selections available for configuring the Transfer step, refer to the *Biomek Software User's Manual,* Chapter 16.3, *Configuring Transfer and Combine Steps.*

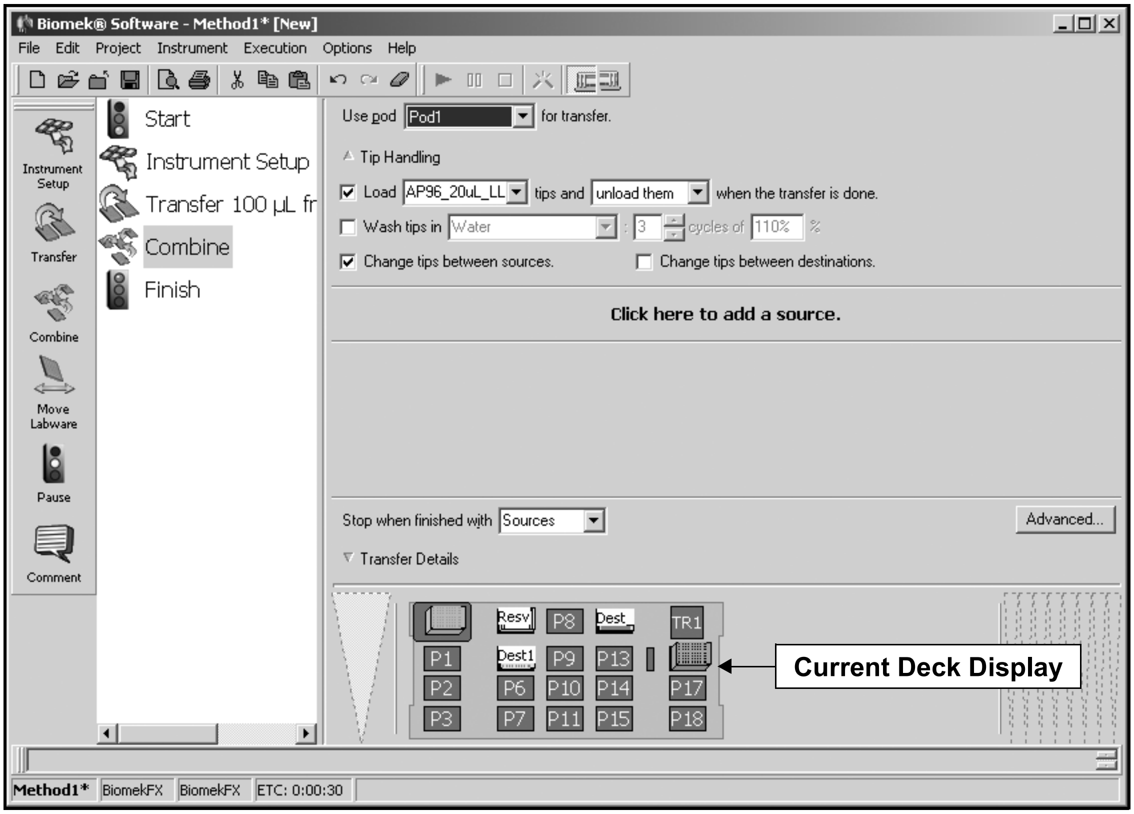
2.5.1 Inserting a Combine Step

To insert a Combine step into your method:

> Drag and drop a **Combine** step from the Step Palette into the Method View just before the Finish step. Notice that the Current Deck Display shows the current position of all labware on the deck (Figure 2-11).

You'll complete three sections to configure the Combine step for this method:

- Section 2.4.2, *Configuring Tip Handling*
- Section 2.4.3, *Configuring Source Labware*
- Section 2.4.4, *Configuring Destination Labware*


Biomek® Software - Method1* [New]

Use pod Pod1 for transfer.

Tip Handling

☑ Load AP96_20uL_LL tips and unload them when the transfer is done.

☐ Wash tips in Water : 3 cycles of 110% %

☑ Change tips between sources. ☐ Change tips between destinations.

Click here to add a source.

Stop when finished with Sources

Transfer Details

Method1* BiomekFX BiomekFX ETC: 0:00:30

Figure 2-11. Combine step inserted into the Method View

2.5.2 Configuring Tip Handling

When you are using disposable tips on the Span-8 Pod, some changes need to be made to the Tip Handling configuration; when you are using fixed tips, see note below.

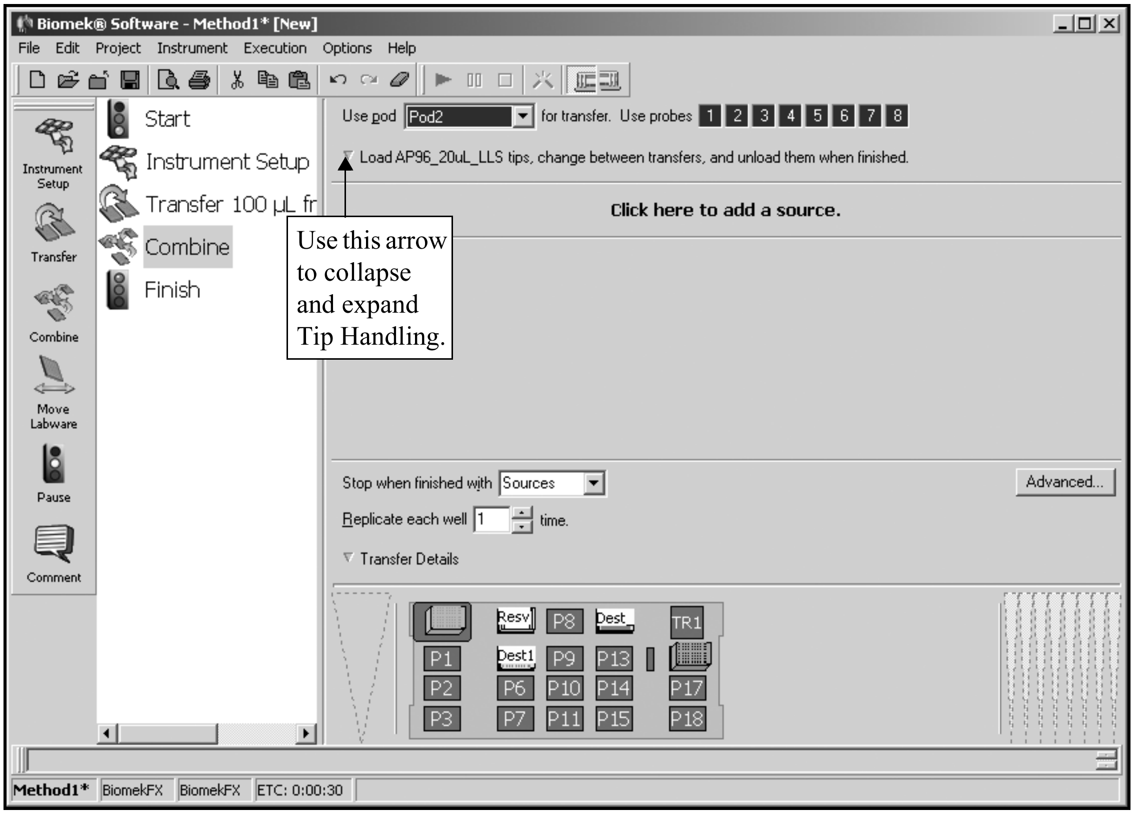
Tip Handling

Configuring Tip Handling is not always required because the Biomek FX locates and loads clean tips automatically during a Combine step. Refer to the *Biomek Software User's Manual*, Chapter 16.3.1, *Configuring Tip Handling*, for more information on other tip handling options, such as Wash tips in and Wash tips with.

Note: When you are using fixed tips, you will use the default Tip Handling settings and do not need to make any changes in Tip Handling. Complete only step 6 of this section and continue with Section 2.5.3, *Configuring Source Labware*.

To configure tip handling using disposable tips:

1. Make sure a Span-8 Pod is selected in Use pod. If your instrument has two pods, the left pod is **Pod1** and the right pod is **Pod2**.
2. In Tip Handling, make sure **Load** is checked
3. Click on the **AP96_20µL_LLS** tip box in the Current Deck Display to load LLS tips as part of the Combine step.
4. Make sure **unload them** is selected in the next field.
5. Check **Change tips between transfers**.
6. Your tips are configured for your liquid transfer, so click the **up arrow** next to Tip Handling to collapse the configuration. This allows more room for the step configuration (Figure 2-12).



Use pod Pod2 for transfer. Use probes 1 2 3 4 5 6 7 8

Load AP96_20uL_LLS tips, change between transfers, and unload them when finished.

Click here to add a source.

Stop when finished with Sources

Replicate each well 1 time.

Transfer Details

Use this arrow to collapse and expand Tip Handling.

Figure 2-12. Combine step with Tip Handling collapsed

2.5.3 Configuring Source Labware

To configure the labware named Dest1 as source labware in the Combine step:

1. Click on **Click here to add a source**.
2. Click on the **Dest1** labware sitting on P5 in the Current Deck Display.

   Note: The information you supplied during Instrument Setup is displayed in the source labware configuration.

3. The Volume field is highlighted, which allows you to designate the amount of liquid to be dispensed. For this tutorial, you're transferring 25 µL; so, type **25** into the Volume field.

   Note: The volume is measured in microliters (µL) automatically and indicates the amount of liquid that will be aspirated (25 µL) from each selected well.

4. Leave the **Auto-Select** checkbox selected to use the technique selected by Biomek Software.
5. Right-click on the large tip illustration next to the microplate graphic in the configuration and choose **Measure from the Bottom**.
6. To adjust the height precisely to 1.00 mm, click on the tip and use the up or down arrow keys on your keyboard while holding the Alt key.

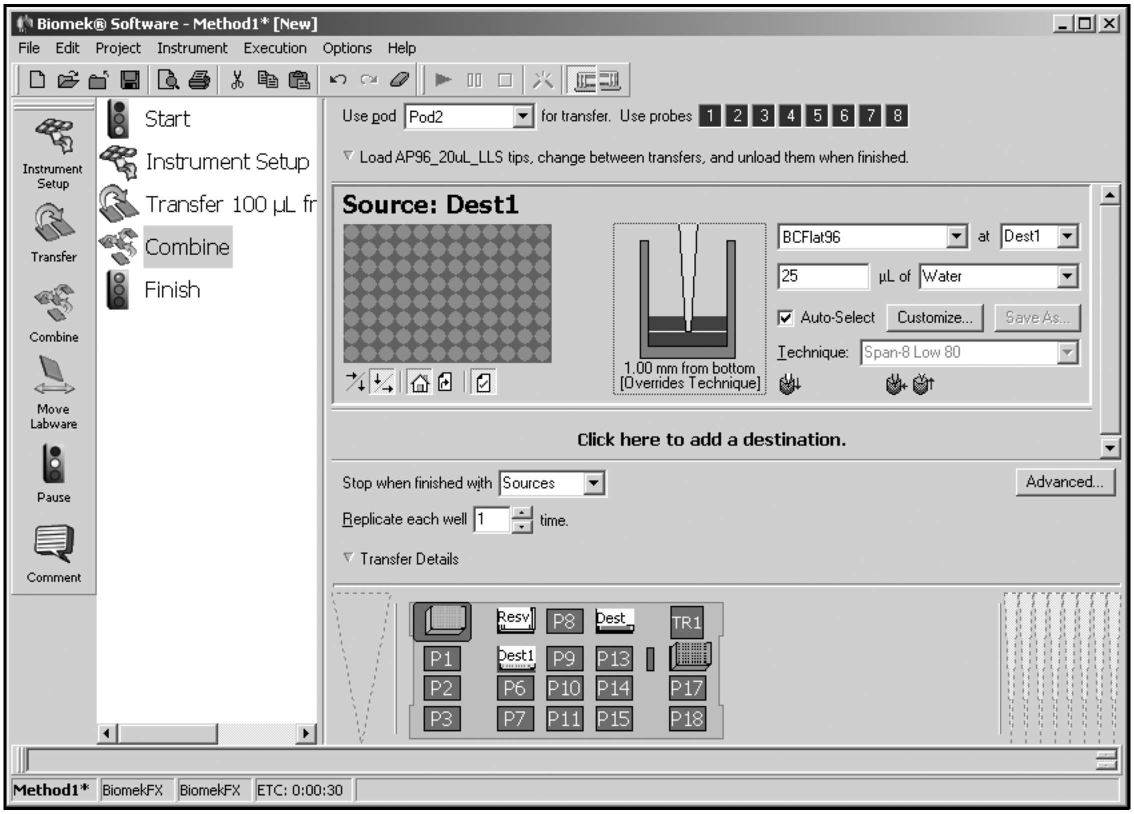
   OR

   Right-click on the graphic, select **Custom Height** from the menu that appears, and enter **1.0** in Height. This will be your aspirate height for this transfer.

Techniques

Techniques allow pipetting settings to be saved globally and used in any method. Biomek Software includes several predefined techniques. If Auto-Select is chosen in a pipetting step, such as Combine, each time a method is created, Biomek Software automatically selects the technique most appropriate for the pipetting operation.

The source labware configuration is complete and the main editor now looks like Figure 2-13.



Use pod Pod2 for transfer. Use probes 1 2 3 4 5 6 7 8

Load AP96_20uL_LLS tips, change between transfers, and unload them when finished.

Source: Dest1

BCFlat96 at Dest1

25 µL of Water

☑ Auto-Select

Technique: Span-8 Low 80

1.00 mm from bottom [Overrides Technique]

Click here to add a destination.

Stop when finished with Sources

Replicate each well 1 time.

Transfer Details

Method1* BiomekFX BiomekFX ETC: 0:00:30

Figure 2-13. Combine step with source labware configured

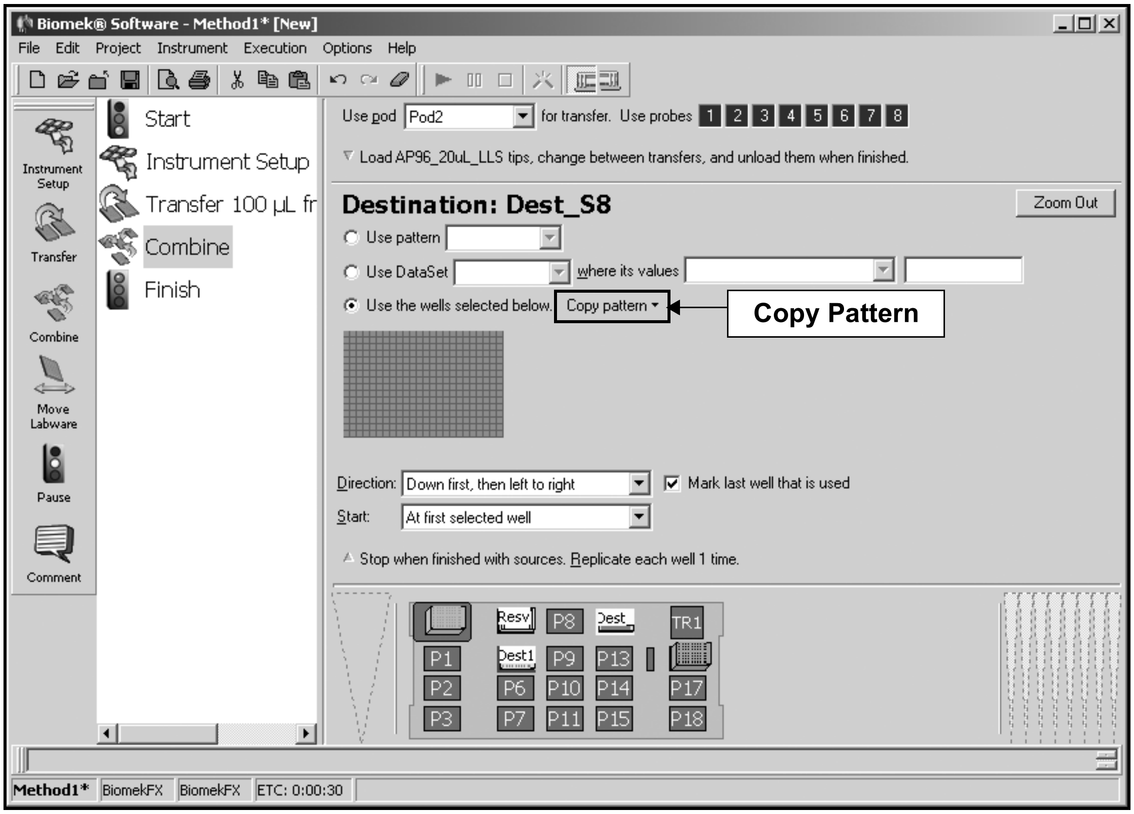
2.5.4 Configuring Destination Labware

To configure the labware named Dest_S8 as destination labware in the Combine step:

1. Click on **Dest_S8** sitting on P12 in the Current Deck Display to select the 384-well microplate as the destination.

   Note: Notice that the source labware configuration is now replaced with a brief sentence summary of the setup. If you want to reopen this source configuration for any reason, click anywhere in the collapsed configuration area.

2. Double-click on the graphic of the destination labware to zoom in on it. The Combine step configuration displays options for selecting the wells to access on the destination labware as shown in Figure 2-14.



Use pod Pod2 for transfer. Use probes 1 2 3 4 5 6 7 8

Load AP96_20uL_LLS tips, change between transfers, and unload them when finished.

Destination: Dest_S8

○ Use pattern

○ Use DataSet where its values

● Use the wells selected below. Copy pattern

Direction: Down first, then left to right ☑ Mark last well that is used

Start: At first selected well

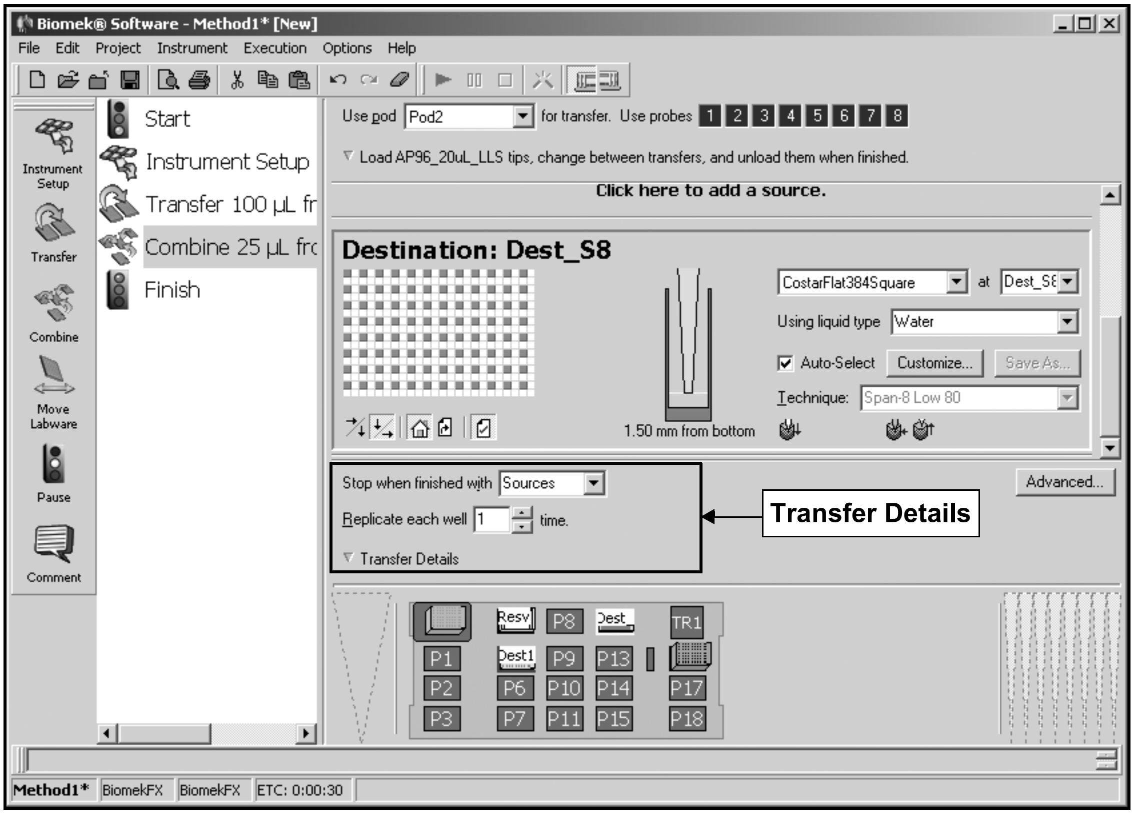
Stop when finished with sources. Replicate each well 1 time.

Figure 2-14. Combine step zoomed in on destination labware

Well Patterns

Well patterns specify the wells of a microplate to aspirate to or dispense from. Any pattern created in the Well Pattern Editor may be used to specify the wells accessed in any step that aspirates or dispenses liquid, such as a Transfer or Combine step. In Section 3.4, *Creating a New Pattern*, you will learn how to create a new well pattern in the Well Pattern Editor.

3. Select **Use pattern** to specify which wells of the 384-well microplate to dispense liquid using a predefined well pattern.
4. Click on the down arrow in the field next to Use pattern to display a list of all the patterns defined in the Well Pattern Editor that are applicable to a 384-well microplate.
5. Since you want to transfer to the upper left quadrant, select **UL_quad_384**. The labware graphic displays all the wells in the upper left quadrant as selected.
6. Choose **Zoom Out** to return to the Combine step configuration. The destination labware is now configured, and the editor looks like Figure 2-15.



Use pod Pod2 for transfer. Use probes 1 2 3 4 5 6 7 8

Load AP96_20uL_LLS tips, change between transfers, and unload them when finished.

Destination: Dest_S8

CostarFlat384Square at Dest_S8

Using liquid type Water

☑ Auto-Select

Technique: Span-8 Low 80

1.50 mm from bottom

Stop when finished with Sources

Replicate each well 1 time.

Transfer Details

Method1* BiomekFX BiomekFX ETC: 0:00:30

Figure 2-15. Combine step with destination labware configured

The Combine step configuration is now complete. In the next section, you will configure a Move Labware step to move labware using the gripper on the Multichannel Pod. If your instrument does not have a Multichannel Pod, skip to Section 2.7, *Using the Finish Step*, to learn how to learn how long the method will take to run.

2.6 Configuring a Move Labware Step

Note: If your instrument does not have a Multichannel Pod, you cannot move labware because your instrument does not have a gripper; continue to Section 2.7, *Using the Finish Step*.

The Move Labware step uses the gripper to move labware from one position to another on the deck or from one ALP to another.

Move Labware can also be used to remove labware from the deck or to an external hardware device without halting the Biomek FX or the method.

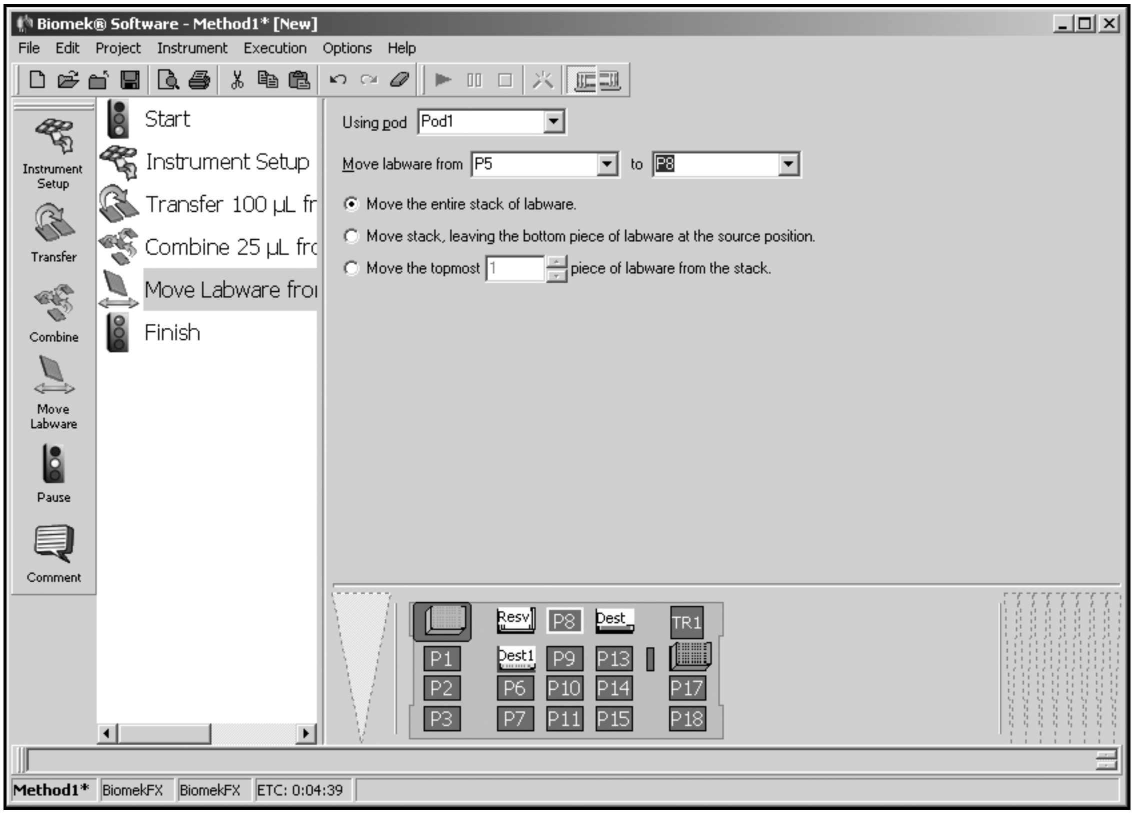
Note: Refer to the *Biomek Software User's Manual,* Chapter 16.4, *Move Labware Step*.

To configure a Move Labware step to move your Dest1 labware at position P5 to another deck position:

1. Insert a **Move Labware** step into the Method View.
2. In Move labware from, select **P5** from the drop-down menu.
3. In Move labware to, select **P8** from the drop-down menu. The editor should now look like Figure 2-16.

Gripper

The gripper has mechanical fingers that extend from the Multichannel Pod to grip labware. Gripper fingers grasp labware along the long side and move the labware from one location on the deck to another. Refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual,* Chapter 2.4, *Gripper*.



Start

Instrument Setup

Transfer 100 µL fr

Combine 25 µL frc

Move Labware fro

Finish

Using pod: Pod1

Move labware from: P5 to: P8

● Move the entire stack of labware.

○ Move stack, leaving the bottom piece of labware at the source position.

○ Move the topmost 1 piece of labware from the stack.

Method1* | BiomekFX | BiomekFX | ETC: 0:04:39

Figure 2-16. Configured Move Labware step

The Move Labware step configuration is complete. Now move on to Section 2.7, *Using the Finish Step*, to learn how long the method will take to run.

2.7 Using the Finish Step

Use the Finish step to see how long it will take to run your method.

1. Click on the **Finish** step in the Method View.
2. Check the status bar at the bottom of the editor for a display of the Estimated Time for Completion (ETC). For this method, the ETC is approximately 4:45 if using both a Multichannel Pod and Span-8 Pod. If using only a Multichannel Pod, the ETC is approximately 0:40, while the approximate time if using only a Span-8 Pod is 4:16.

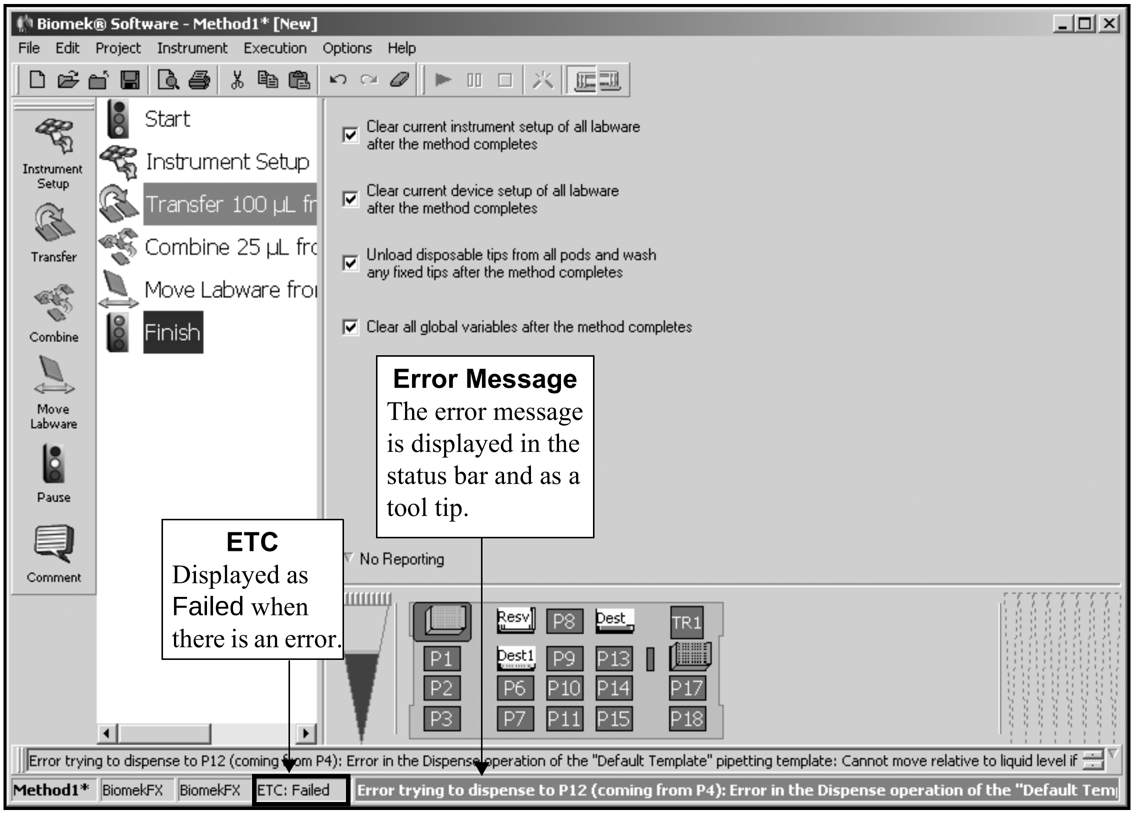
Note: Your ETC may vary slightly. That's OK.

Note: Refer to the *Biomek Software User's Manual*, Chapter 13.2.2, *Configuring the Finish Step*, for information on configuring the Finish step.

2.7.1 Handling Configuration Errors

If there is a step configuration error in your method, the step with the error is highlighted in red (Figure 2-17) and the ETC is displayed as Failed when you click on the Finish or any step that occurs after the step with error. The error message also is displayed in the status bar or when hovering the mouse over the highlighted step. Use the message to correct the error and reconfigure the step.

Note: Refer to the *Biomek Software User's Manual*, Chapter 26, *Handling and Preventing Errors*, for more information on handling and preventing errors.



☑ Clear current instrument setup of all labware after the method completes

☑ Clear current device setup of all labware after the method completes

☑ Unload disposable tips from all pods and wash any fixed tips after the method completes

☑ Clear all global variables after the method completes

Error trying to dispense to P12 (coming from P4): Error in the Dispense operation of the "Default Template" pipetting template: Cannot move relative to liquid level if

Method1* | BiomekFX | BiomekFX | ETC: Failed | Error trying to dispense to P12 (coming from P4): Error in the Dispense operation of the "Default Tem

Error Message
The error message is displayed in the status bar and as a tool tip.

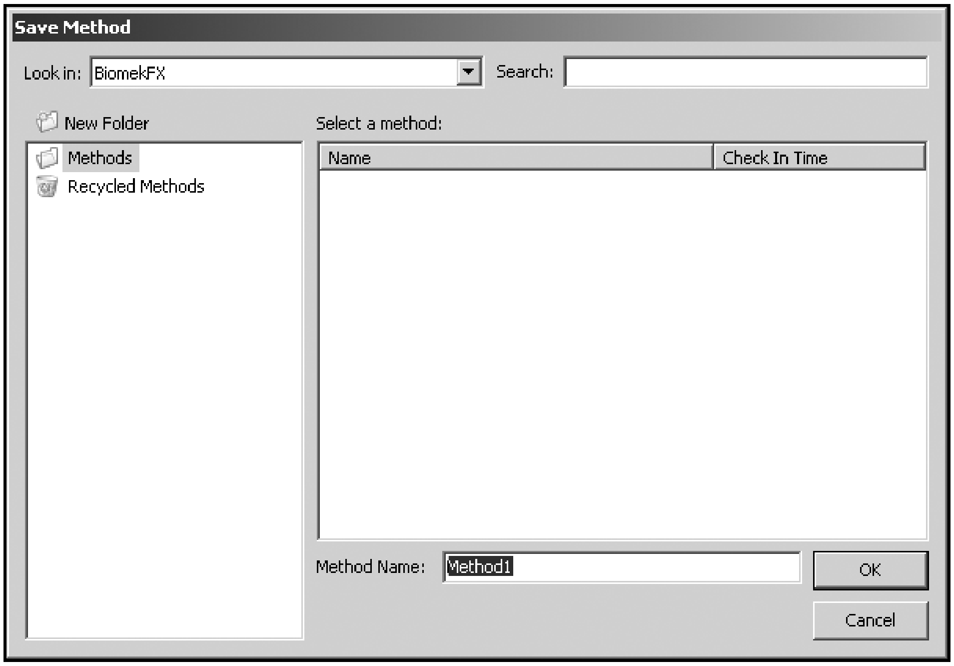
ETC
Displayed as Failed when there is an error.

Figure 2-17. Quick-Start method with error

2.8 Saving a Method

After you've clicked on Finish step, you can save your method.

1. Choose **File>Save** from the toolbar. Save Method appears (Figure 2-18).



Look in: BiomekFX

Method Name: Method1

Figure 2-18. Save Method

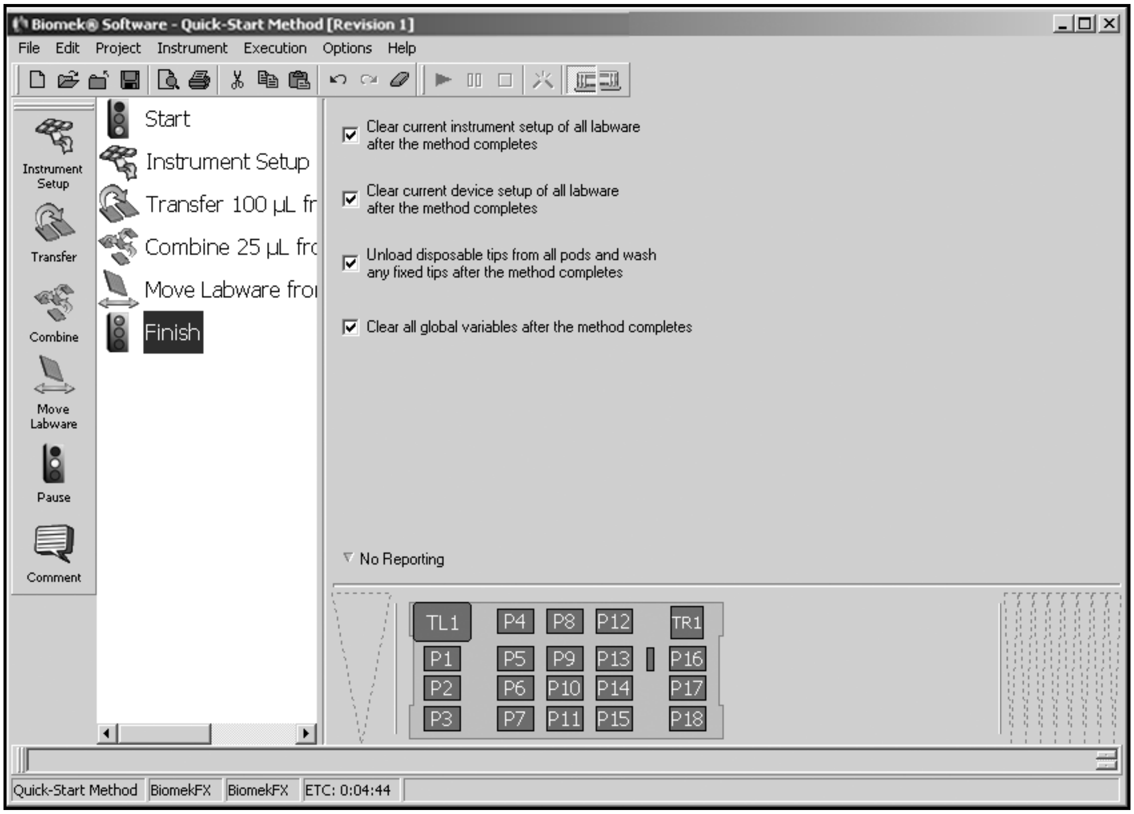
2. In Method Name, enter Quick-Start Method and choose **OK**. The method editor now looks like Figure 2-19.

Methods and Projects

Saving a method automatically checks in the method, creating a record of the revision that preserves the method configuration at the time it was saved. If any of the project items, such as labware class definitions or techniques, changes after the method is saved, when the method is opened next, the latest definitions are used. Refer to the *Biomek Software User's Manual*, Chapter 13, *Creating and Using Methods*.

Project Files

A project file stores information about liquid types; labware and tip types; well patterns; and pipetting templates and techniques as revisions that are used by a method file to configure the actions of the instrument. Project files store a history of all changes, additions, and deletions of items from the project file. Refer to the *Biomek Software User's Manual*, Chapter 7, *Understanding and Using Project Files*.



☑ Clear current instrument setup of all labware after the method completes

☑ Clear current device setup of all labware after the method completes

☑ Unload disposable tips from all pods and wash any fixed tips after the method completes

☑ Clear all global variables after the method completes

No Reporting

Figure 2-19. Quick-Start method saved and named

Move on to Section 2.9, *Running a Method*, to run your saved Quick-Start method.

2.9 Running a Method

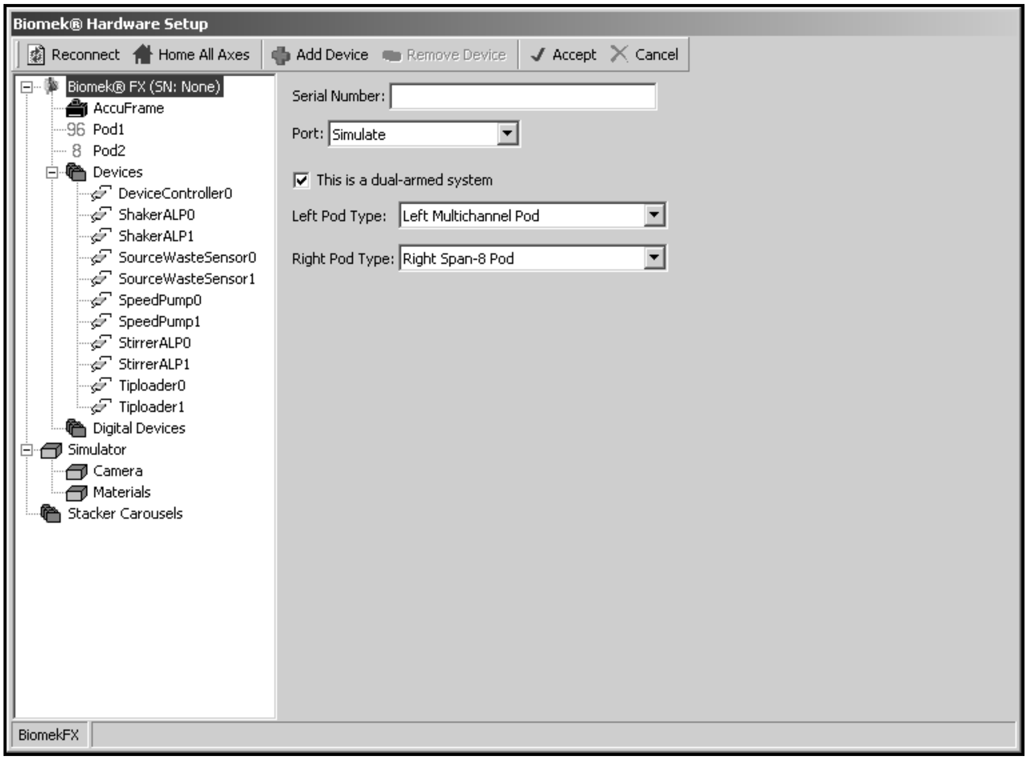
Next you will run the method you just created using the simulator. The simulator allows you to watch the method on your screen without actually running the method on an instrument.

To run your saved method:

1. If you do not see the Simulation Display button on the toolbar (Figure 2-21), from the Instrument menu, choose **Hardware Setup**. Biomek Hardware Setup appears.

Purging Air from Span-8 Pod

When running a method using a Span-8 Pod, it is important that air be purged from the tubing and syringes before a method is run. Refer to the *Biomek Software User's Manual*, Chapter 13.17.6, *Purging Air From Span-8 Pod Before a Method Run (FX and NX-S8 Only)*.



Serial Number:

Port: Simulate

☑ This is a dual-armed system

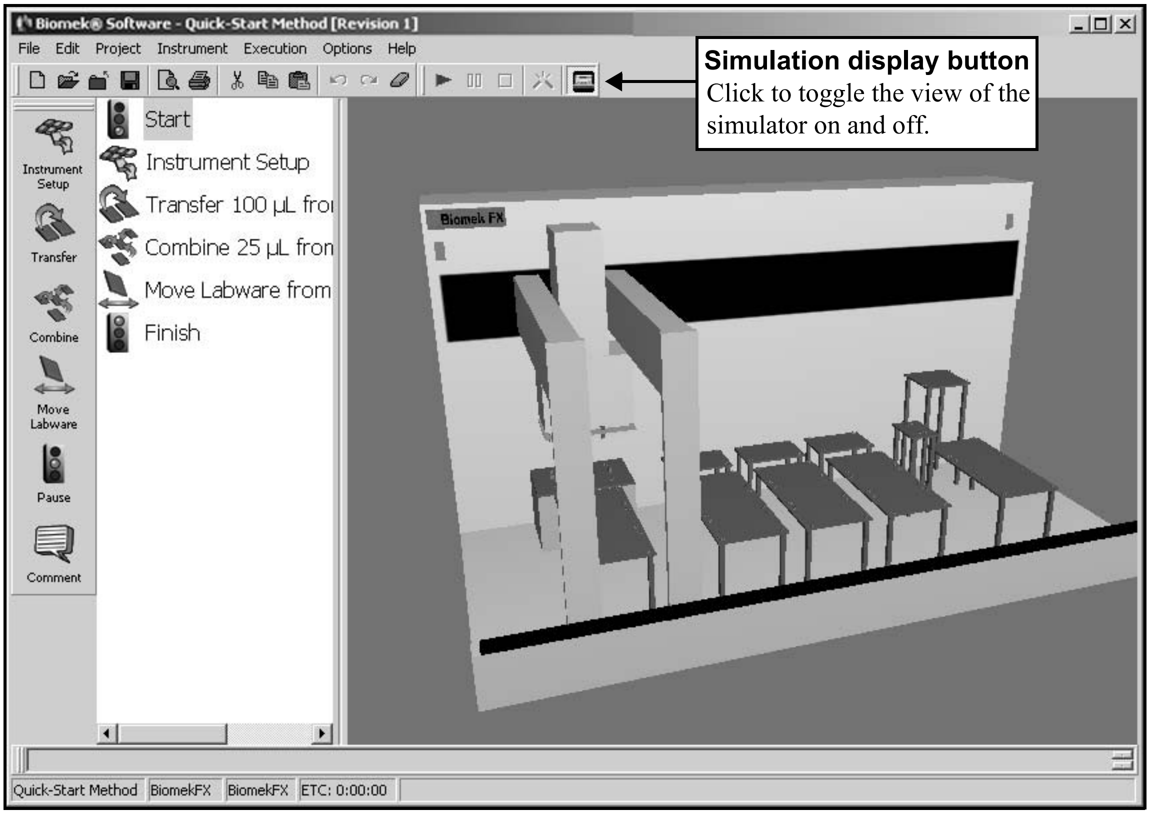
Left Pod Type: Left Multichannel Pod

Right Pod Type: Right Span-8 Pod

Figure 2-20. Hardware Setup

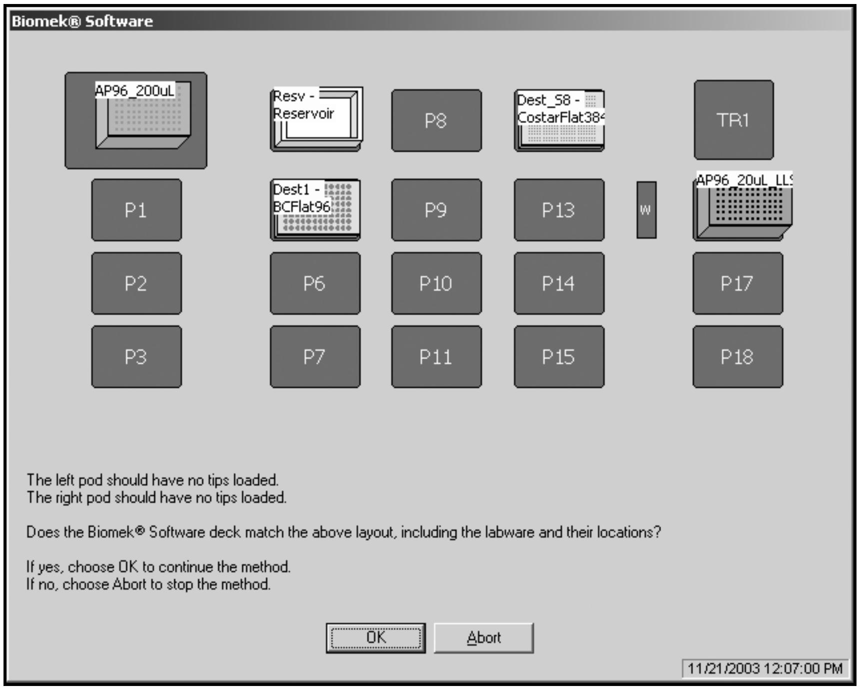
2. In Port, select **Simulate**.
3. Choose **Accept** to save changes and close Hardware Setup. Biomek Software is now running in simulation mode.

4. Click on the **green arrow** button on the toolbar. The simulation display is automatically launched and the step configuration area is replaced with a three-dimensional model of your Biomek FX (Figure 2-21). The deck confirmation prompt (Figure 2-22) appears on top of the main editor.



Simulation display button
Click to toggle the view of the simulator on and off.

Figure 2-21. Biomek FX simulator displayed



The left pod should have no tips loaded.
The right pod should have no tips loaded.

Does the Biomek® Software deck match the above layout, including the labware and their locations?

If yes, choose OK to continue the method.
If no, choose Abort to stop the method.

Figure 2-22. Deck confirmation prompt for Quick Start method

5. Choose **OK**. The prompt closes and the method continues. View the method as it proceeds in the simulator. The method can also be followed in the Method View as steps are highlighted in green as they are executed.

Note: If you are running this method on your instrument instead of the simulator, make sure that the physical deck layout matches the expected deck layout shown in the deck confirmation prompt before you choose **OK**.

You can proceed directly to Chapter 3, *Using the Editors While Creating Methods*, to learn about the editors you'll use while creating your methods.

3 Using the Editors While Creating Methods

3.1 Overview

In this chapter you will be given information and instructions for using the editors in the Biomek Software. The editors allow you to customize a method to your special requirements. You can go beyond the predefined project items and instrument configurations; manually control the pod; restore instrument settings and project files; and configure external devices using specific editors. The editors are accessed from the Project or Instrument menus located on the toolbar of the Biomek main editor (Figure 3-1).

Read the information in this chapter and complete the tutorial steps provided. After you have completed the instructions, or if you need additional information along the way, use the links provided to access the *Biomek Software User's Manual*.

This chapter includes the following information:

- *General Description of Editors* (Section 3.2)
- *Creating New Labware in the Labware Type Editor* (Section 3.3)
- *Creating a New Pattern* (Section 3.4)
- *Creating a New Deck* (Section 3.5)
- *Manually Controlling the Pod* (Section 3.6)

3.2 General Description of Editors

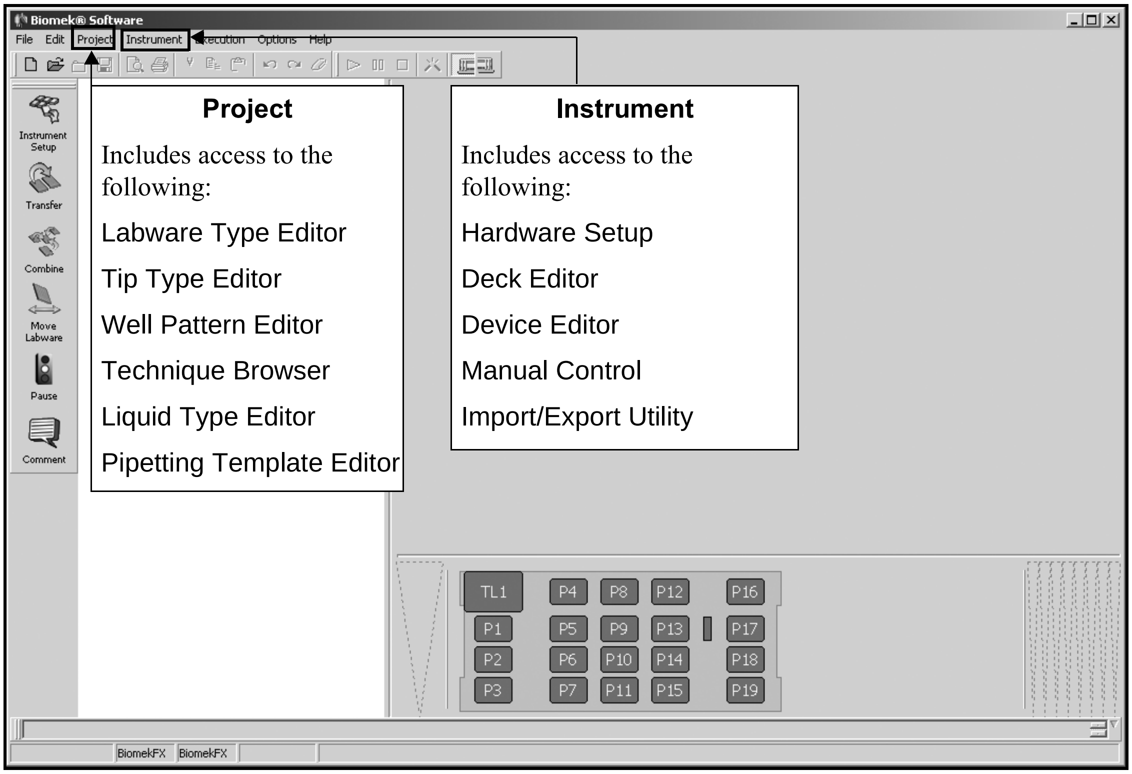
If using Accounts & Permissions . . .
You must have Develop Projects and Setup Instrument permissions to access the editors on the Project and Instrument menus. Refer to the *Biomek Software User's Manual*, Chapter 2, *Using Accounts & Permissions*, for more information.

Several editors are used to configure Biomek Software to control your Biomek FX instrument. Editors are accessed from one of two menus:

- Project menu (Figure 3-1)

  OR

- Instrument menu (Figure 3-1)



Project

Includes access to the following:

Labware Type Editor

Tip Type Editor

Well Pattern Editor

Technique Browser

Liquid Type Editor

Pipetting Template Editor

Instrument

Includes access to the following:

Hardware Setup

Deck Editor

Device Editor

Manual Control

Import/Export Utility

Figure 3-1. Biomek main editor

Following is a brief description of the editors available from the two menus displayed in Figure 3-1. If you would like to learn more about a specific editor, refer to the specified chapter for more information.

You will work with three of the more commonly used editors and Manual Control in this quick-start guide.

3.2.1 Project Menu

The editors on the **Project** menu (Figure 3-1) allow project items to be created, copied, revised, and renamed. They include the following:

- **Labware Type Editor** — allows you to add new labware types, copy labware types, delete labware types, rename labware types, and edit labware type properties (refer to the *Biomek Software User's Manual,* Chapter 8, *Creating and Modifying Tip and Labware Types*).

  Note: Refer to Section 3.3, *Creating New Labware in the Labware Type Editor*, in this quick-start guide to follow step-by-step instructions to create new piece of labware.

- **Tip Type Editor** — allows you to add new tips types, remove tip types, and change tip properties (refer to the *Biomek Software User's Manual,* Chapter 8, *Creating and Modifying Tip and Labware Types*).
- **Well Pattern Editor** — allows you to create and store patterns for hitting specific wells (refer to the *Biomek Software User's Manual,* Chapter 12, *Creating Well Patterns*).

  Note: Refer to Section 3.4, *Creating a New Pattern*, in this quick-start guide to learn how to create a well pattern.

- **Technique Browser** — allows you to customize techniques for your specific needs and save them for use in future methods (refer to the *Biomek Software User's Manual,* Chapter 10, *Understanding and Creating Techniques*).
- **Liquid Type Editor** — allows you to create new liquid types or to modify existing liquid types for methods (refer to the *Biomek Software User's Manual,* Chapter 9, *Understanding and Creating Liquid Types*).
- **Pipetting Template Editor** — allows you to create or modify pipetting templates that configure the precise actions during pipetting operations (refer to the *Biomek Software User's Manual,* Chapter 11, *Using the Pipetting Template Editor*).

3.2.2 Instrument Menu

The editors on the **Instrument** menu (Figure 3-1) allow instrument configuration to be changed. They include the following:

- **Hardware Setup** — if you change the configuration of your instrument, it is used to install, configure, and remove other devices (refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual,* Appendix 4, *Configuring the Biomek® FX in Hardware Setup*).
- **Deck Editor** — used to define and change deck configurations. (refer to the *Biomek Software User's Manual,* Chapter 6, *Preparing and Managing the Deck*).

Note: Refer to Section 3.5, *Creating a New Deck*, in this quick-start guide to follow step-by-step instructions to create a new deck layout in the software.

- **Device Editor** — external devices may be integrated to your Biomek FX instrument. In order to use the device, it must be configured through the **Device Editor** (refer to the *Biomek Software User's Manual,* Chapter 23.4.1, *Configuring Devices Using the Device Editor*).
- **Manual Control** — allows you to control the movement of the bridge, head, and gripper independently of a method. It is used to control the pod when framing the deck or gripper and when recovering from errors (refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual,* Chapter 6, *Manually Controlling the Biomek® FX in Biomek Software*).

Note: Refer to Section 3.6, *Manually Controlling the Pod*, in this quick-start guide to learn how to manually move a pod to another position after using **Z-Max** to raise it to the highest configured height.

- **Import/Export Utility** — allows you to import and export instrument settings (decks, framing tools, pod settings) as import files (.imp) (refer to the *Biomek Software User's Manual,* Chapter 4.4, *Sharing Instrument Settings Using the Import/Export Utility*).

3.3 Creating New Labware in the Labware Type Editor

Labware Definitions

When creating a new labware type that will be used on your instrument, it is important that the labware dimensions are entered precisely per the manufacturer’s specifications. An incorrect labware definition could result in a number of problems, including collisions, gripper errors, or poor pipetting performance.

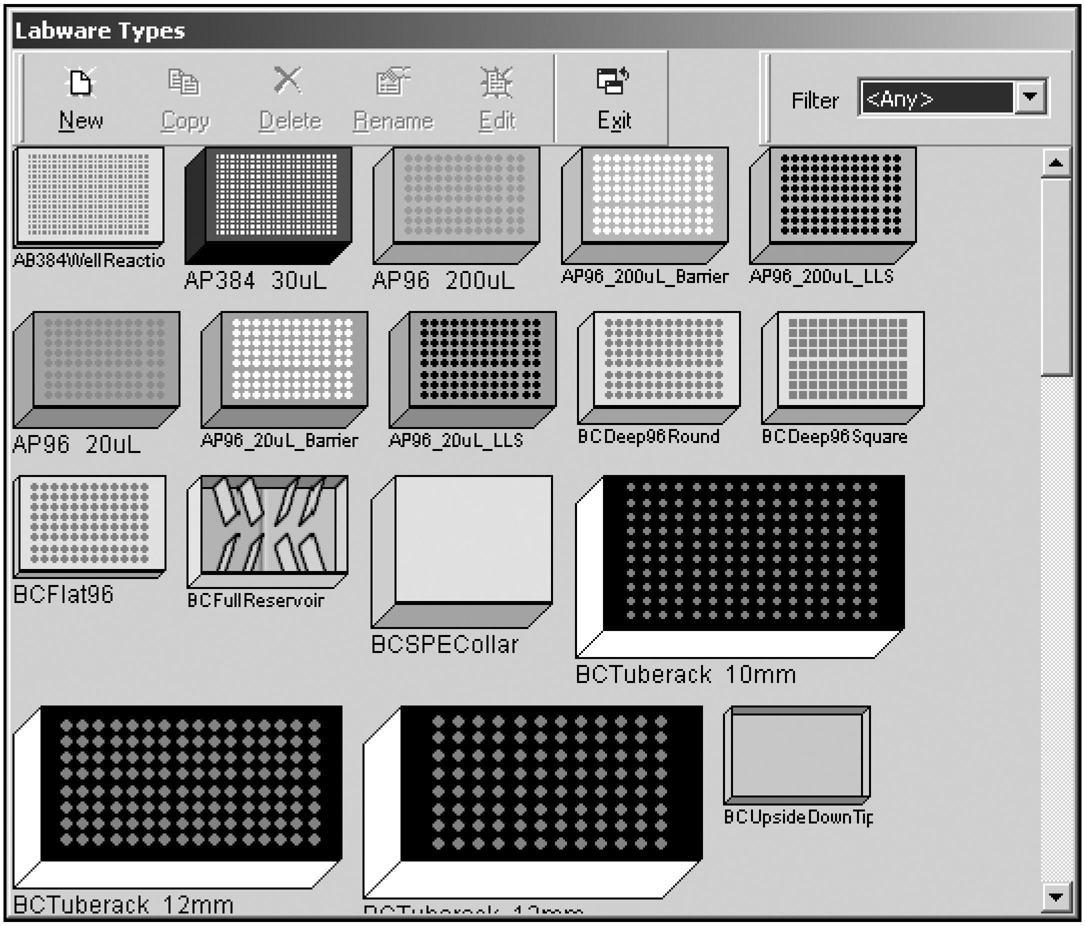
The Labware Type Editor is used to create labware definitions so you can use labware that is not predefined in Biomek Software in your methods.

Assume that you have new labware that is very similar to a BCFlat96, but some specifications are slightly different so you must create a new labware type in the Labware Type Editor in order to use this new type in your methods. Refer to the *Biomek Software User’s Manual*, Chapter 8, *Creating and Modifying Tip and Labware Types*.

Note: Do not run a method outside of the simulator using the labware you create here; the specifications may not be accurate for the physical piece of labware you use in this tutorial method *(see sidebar)*.

To create new labware in the Labware Type Editor:

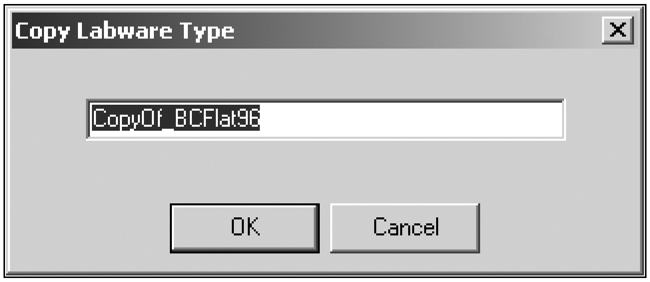
1. From the Project menu, choose **Labware Type Editor**. Labware Types appear (Figure 3-2)



Filter <Any>

Figure 3-2. Labware Types

2. Click on BCFlat96 and choose **Copy**. Copy Labware Type appears (Figure 3-3).



CopyOf_BCFlat96

Figure 3-3. Copy Labware Type

Note: To retain the dimensions of predefined labware in Biomek Software, it is important to copy and the4n edit the copy of the labware type rather than just editing the predefined labware to meet the new labware specifications.

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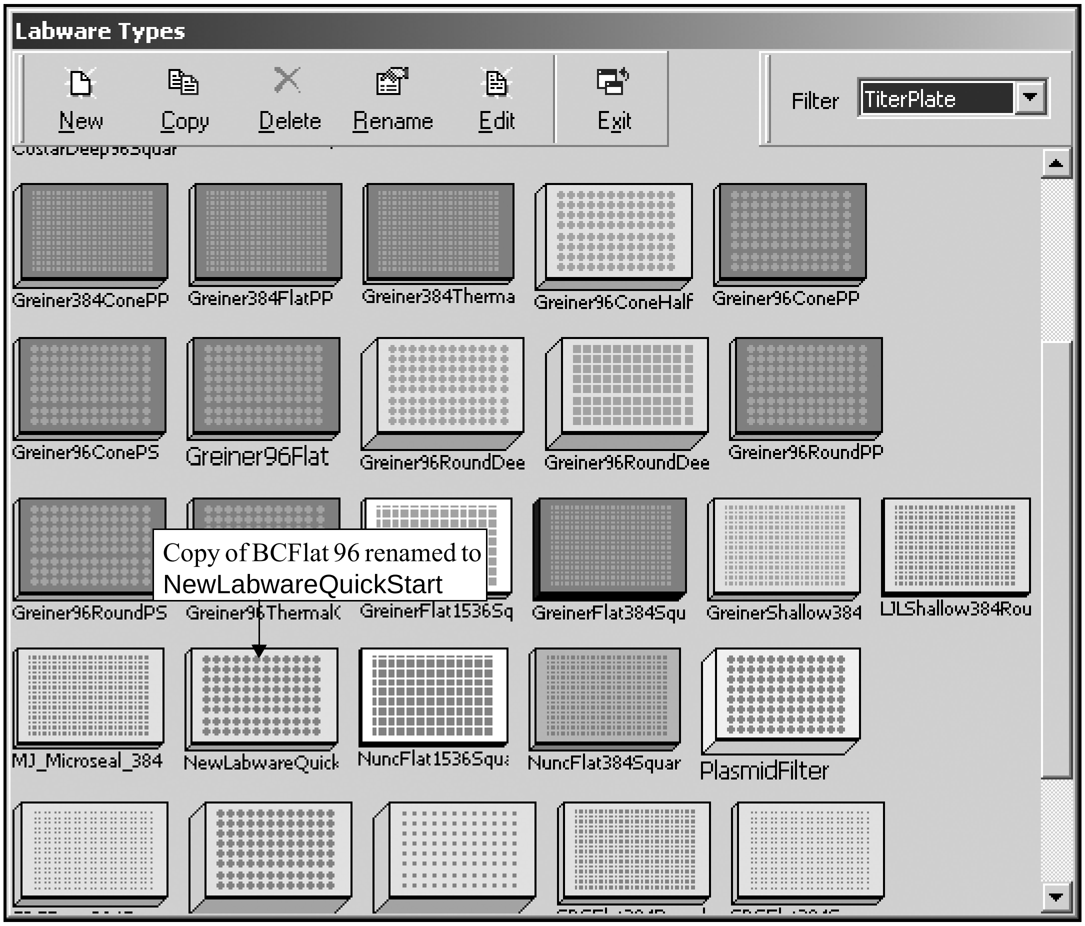
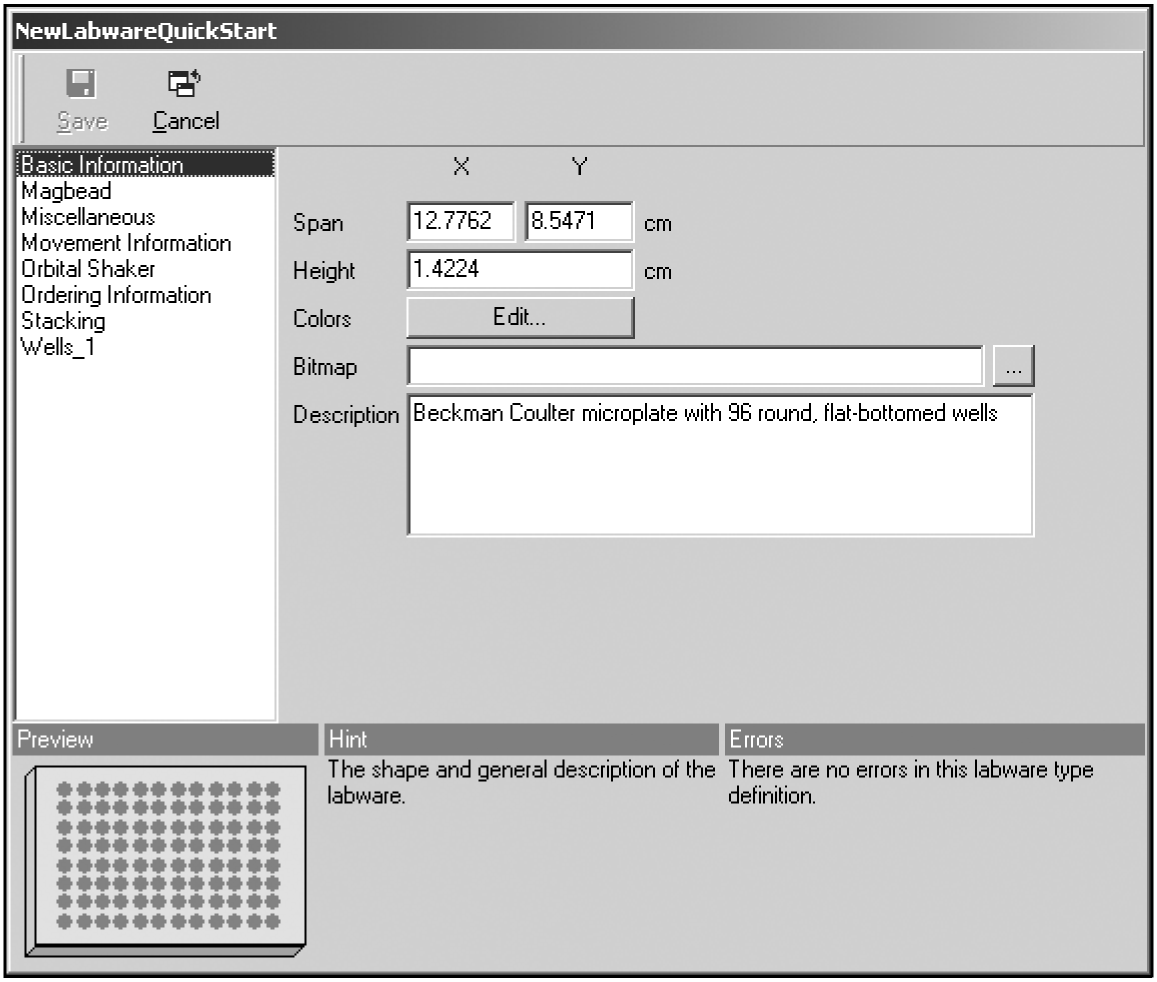
3. Enter NewLabwareQuickStart and choose **OK**. The copy of BCFlat96 is created with the specified name and appears in Labware Type Editor (Figure 3-4).



Filter: TiterPlate

Figure 3-4. NewLabwareQuickStart in Labware Type Editor

4. Double-click the NewLabwareQuickStart graphic. NewLabwareQuickStart appears (Figure 3-5).



Span 12.7762 8.5471 cm

Height 1.4224 cm

Description Beckman Coulter microplate with 96 round, flat-bottomed wells

Hint: The shape and general description of the labware.

Errors: There are no errors in this labware type definition.

Figure 3-5. NewLabwareQuickStart

Note: Each piece of labware in Labware Types has its own mini-editor similar to Figure 3-5 to allow specifications to be revised and saved.

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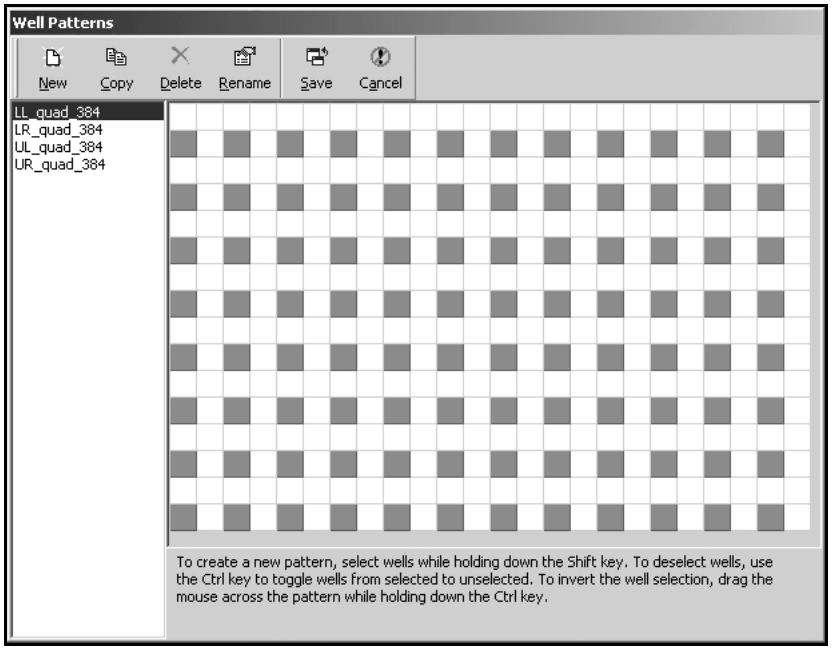
5. In Height, enter **1.46** and choose **Save**. You have created a new piece of labware in the Labware Type Editor.
6. Choose **Exit** to close the Labware Type Editor.

3.4 Creating a New Pattern

The Well Pattern Editor is used to create and store patterns for accessing specific wells in labware. There are also pre-defined patterns in Well Patterns that may be used or copied to create new patterns. The patterns created and stored in Well Patterns are accessible in the Transfer and Combine steps using the Span-8 Pod.

To create a new well pattern based on the NewLabwareQuickStart labware you have created:

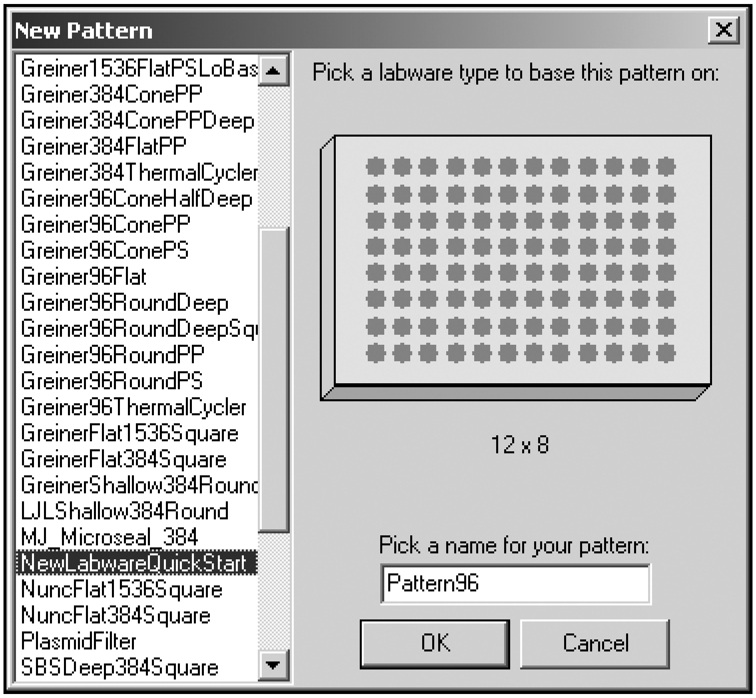
1. From the Project menu, choose **Well Pattern Editor**. Well Patterns appears (Figure 3-6).



To create a new pattern, select wells while holding down the Shift key. To deselect wells, use the Ctrl key to toggle wells from selected to unselected. To invert the well selection, drag the mouse across the pattern while holding down the Ctrl key.

Figure 3-6. Well Patterns

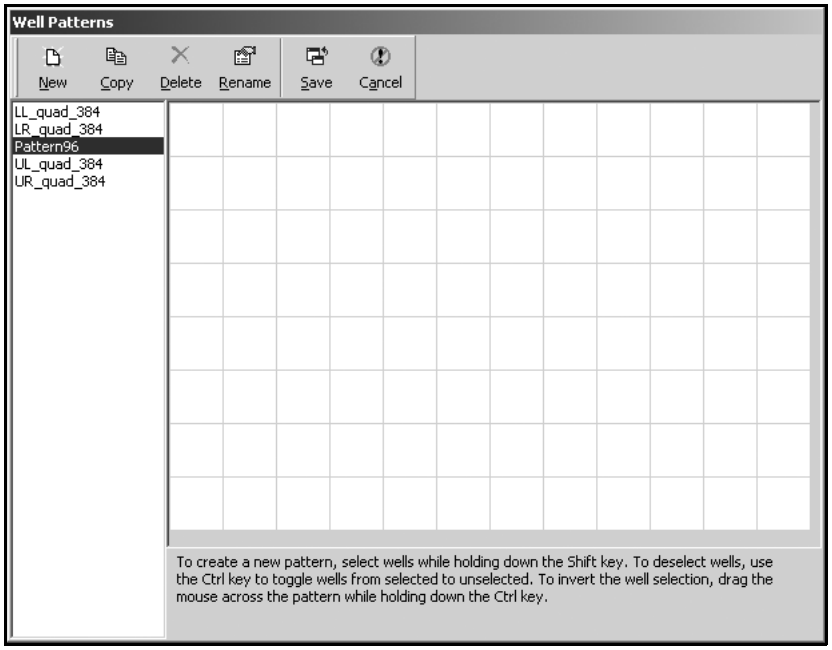
2. Choose **New**. New Pattern appears (Figure 3-7).



Pattern96

Figure 3-7. New Pattern

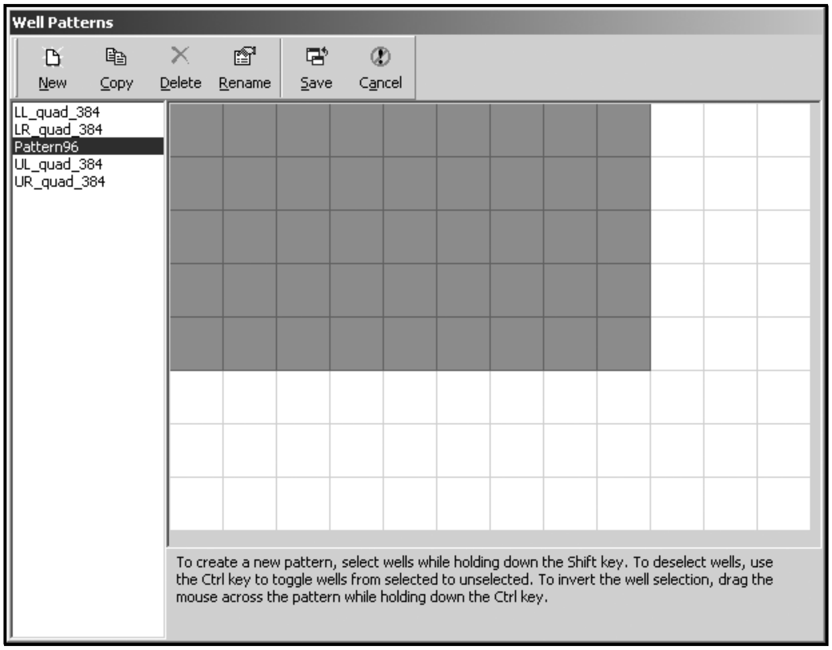
3. Highlight NewLabwareQuickStart and choose **OK**. Figure 3-8 appears.



To create a new pattern, select wells while holding down the Shift key. To deselect wells, use the Ctrl key to toggle wells from selected to unselected. To invert the well selection, drag the mouse across the pattern while holding down the Ctrl key.

Figure 3-8. Well Patterns based on Pattern 96

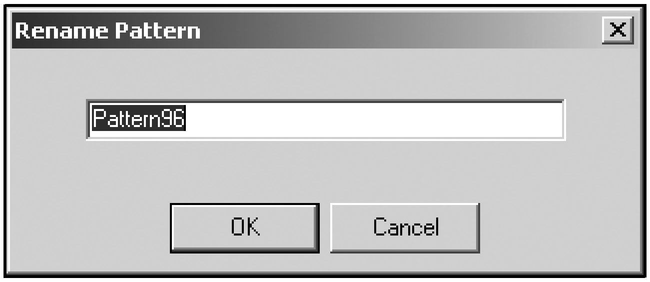
4. While holding down the Shift key, select the wells for the new pattern so it looks like Figure 3-9.



To create a new pattern, select wells while holding down the Shift key. To deselect wells, use the Ctrl key to toggle wells from selected to unselected. To invert the well selection, drag the mouse across the pattern while holding down the Ctrl key.

Figure 3-9. Wells chosen for the new pattern

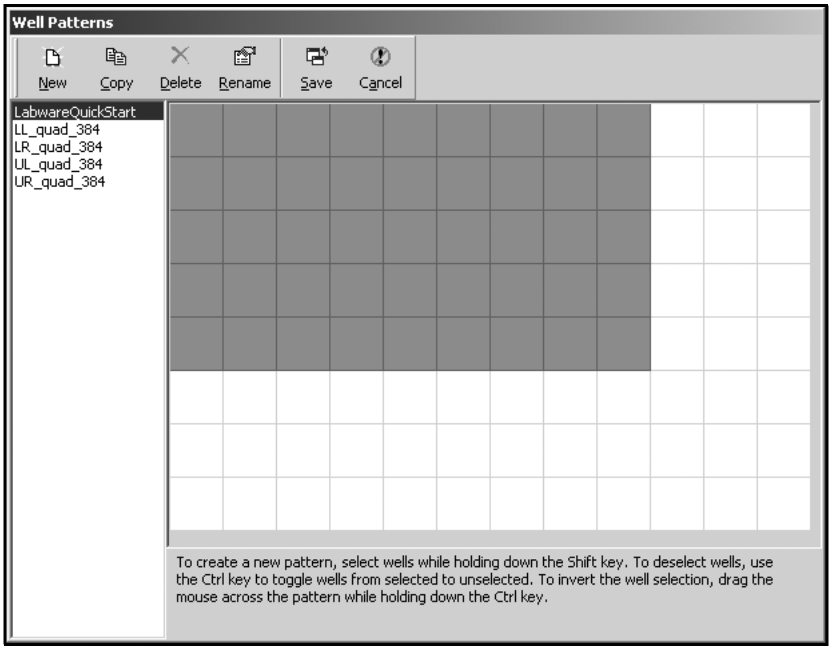
5. Choose **Rename** to rename the new pattern. Rename Pattern appears (Figure 3-10).



Pattern96

Figure 3-10. Rename Pattern

6. Enter LabwareQuickStart and choose **OK**. Figure 3-11 appears.



To create a new pattern, select wells while holding down the Shift key. To deselect wells, use the Ctrl key to toggle wells from selected to unselected. To invert the well selection, drag the mouse across the pattern while holding down the Ctrl key.

Figure 3-11. New pattern renamed

7. Choose **Save** to save LabwareQuickStart in Well Patterns.

Note: Refer to the *Biomek Software User's Manual*, Chapter 12, *Creating Well Patterns*, for more information.

3.5 Creating a New Deck

Framing

Framing is the procedure of teaching the Biomek Software the location of the ALPs and devices positioned on the deck. Biomek Software uses this framing information to move the pod(s) to the appropriate positions to perform liquid-handling operations and manipulate labware.

A Beckman Coulter Service Engineer frames the Biomek FX instrument during system installation. It may be necessary to repeat the framing if ALPs or devices are added, moved, or removed from the deck; the head on the Multichannel Pod is changed; or the probes on the Span-8 Pod are changed. Refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual*, Chapter 5, *Framing the Biomek® FX*.

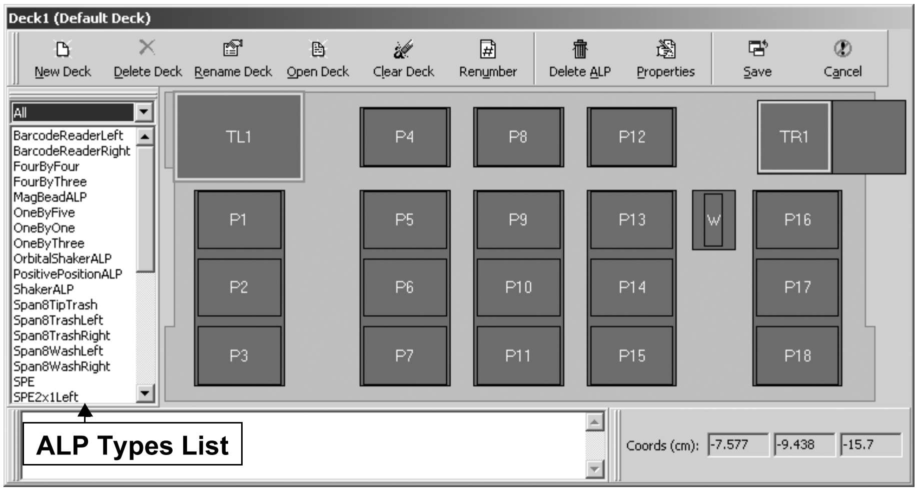
A deck in the Biomek Software refers to the software representation of the physical Biomek FX deck. The Deck Editor is used to define and change deck configurations, and stores deck information used for multiple methods. A deck also stores framing information and device associations for each position on the deck.

Assume you have added another Span-8 Wash ALP to your deck and now must create another deck in the Deck Editor that reflects that addition to the physical deck.

Note: Refer to the *Biomek Software User's Manual*, Chapter 6, *Preparing and Managing the Deck*, for detailed information on using the Deck Editor.

To create a new deck in the Deck Editor:

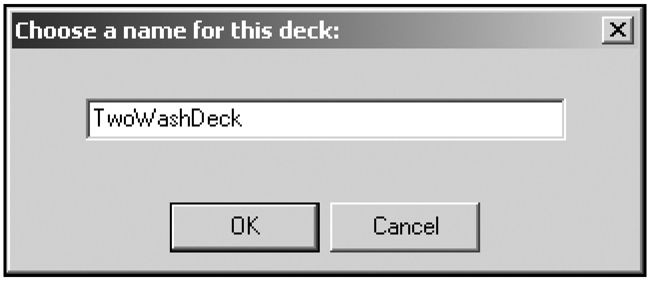
1. Choose **Instrument>Deck Editor**. Deck Editor appears (Figure 3-12).



Coords (cm): -7.577 -9.438 -15.7

Figure 3-12. Deck Editor

2. Select New Deck. Choose a name for this deck appears (Figure 3-13).



TwoWashDeck

Figure 3-13. Choose a name for this deck

3. Enter TwoWashDeck and choose **OK**. TwoWashDeck appears.
4. Click and hold the mouse button on Span8WashLeft from the ALP Types List. Locations capable of supporting that ALP are indicted in the Deck View by dashed boxes.

5. Drag and drop **Span8WashLeft** to any location capable of supporting it (Figure 3-14). A second Span8WashLeft has been added to the deck. This deck is now the default deck and is available in the Instrument Setup step.

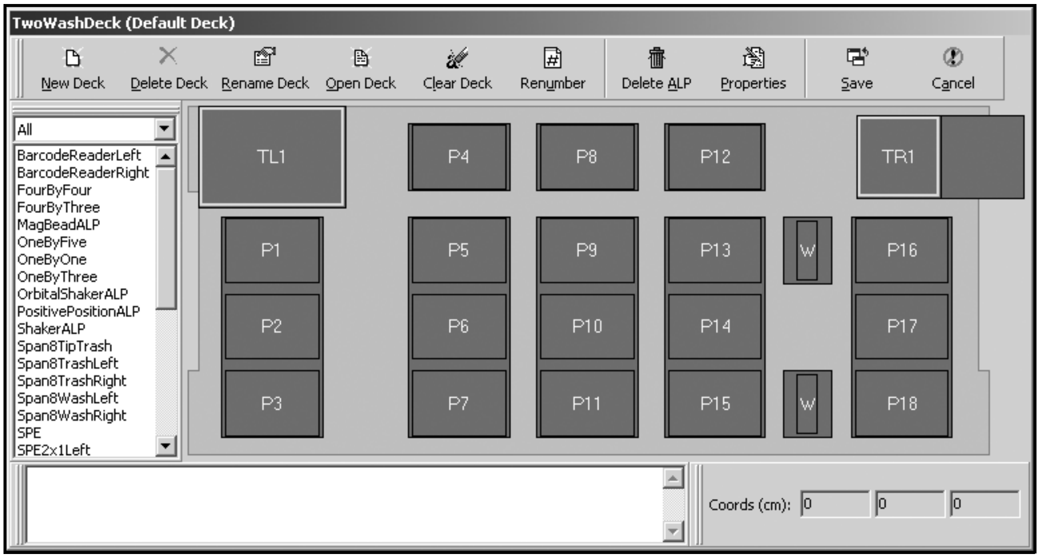


Figure 3-14. TwoWashDeck with second Span-8Wash added

6. Select **Open Deck**. Select a Deck appears (Figure 3-15).

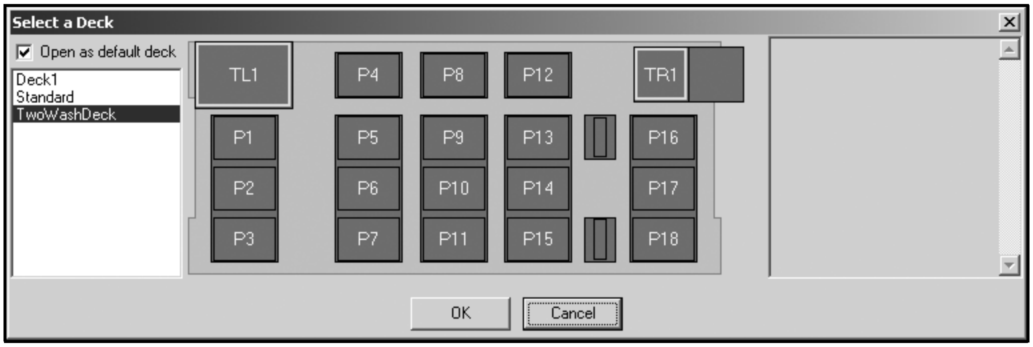


Figure 3-15. Select a Deck

7. Choose **Deck1** to make it the default deck since it is the deck you used when you created the Quick-Start Method and choose **OK**.

8. Choose **Save** to exit the Deck Editor.

3.6 Manually Controlling the Pod

If you need to manually control the Biomek FX instrument, including moving the bridge, head, and gripper, outside of a method, you'll use Manual Control. Manual Control is also used to control the pod when framing the deck or gripper and when recovering from errors. Refer to the *Biomek® FX and FX-P Laboratory Automation Workstations User's Manual,* Chapter 6, *Manually Controlling the Biomek® FX in Biomek Software*, for additional information.

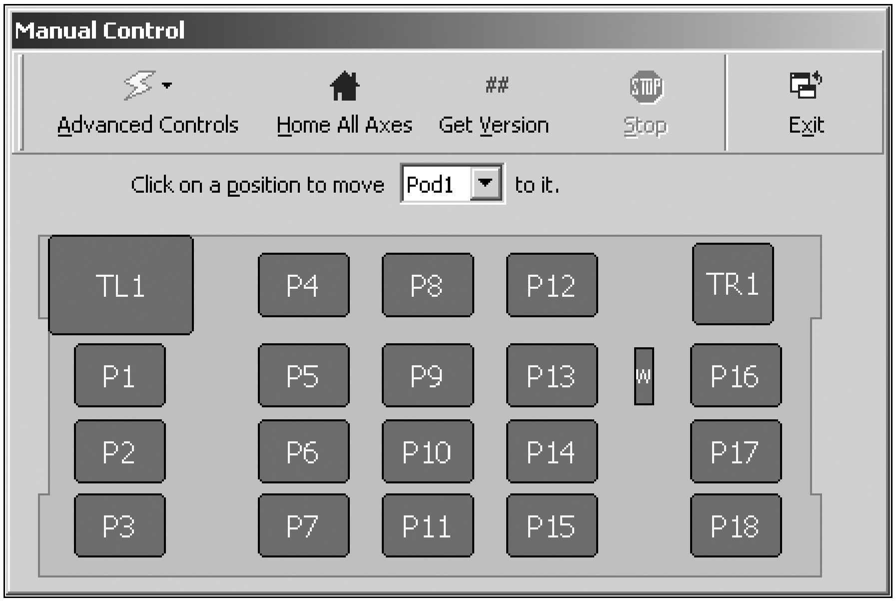
Note: Manual Control is used also for controlling individual ALPs and Device Controller outside a method (refer to the ALPs User's Manual).

Using the following instructions, you'll use Manual Control to move the pod to a different position on the deck. You'll move the pod to the Z-max height first to make sure you don't hit anything on the deck and then you'll move the pod to a selected position.

Note: If you launch the simulator, you can watch the pod move as you complete the following steps.

To move the pod(s) using Manual Control:

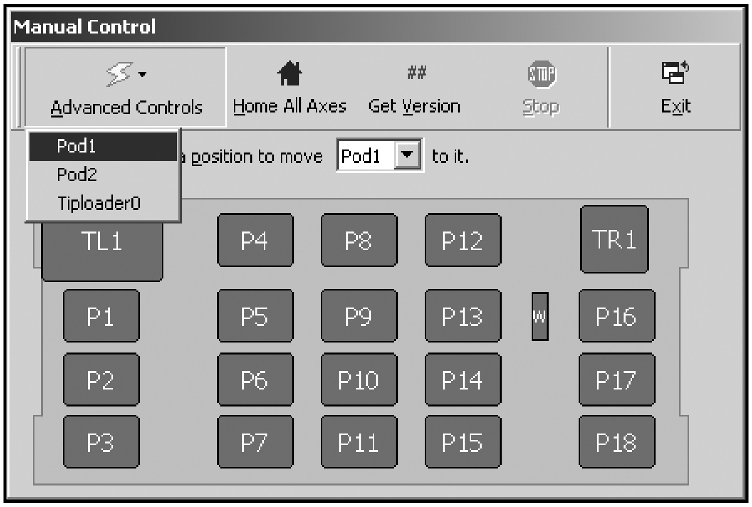
1. Choose **Instrument>Manual Control**. Manual Control appears (Figure 3-16). Here is where you can choose to which position you want to move a pod.



Click on a position to move Pod1 to it.

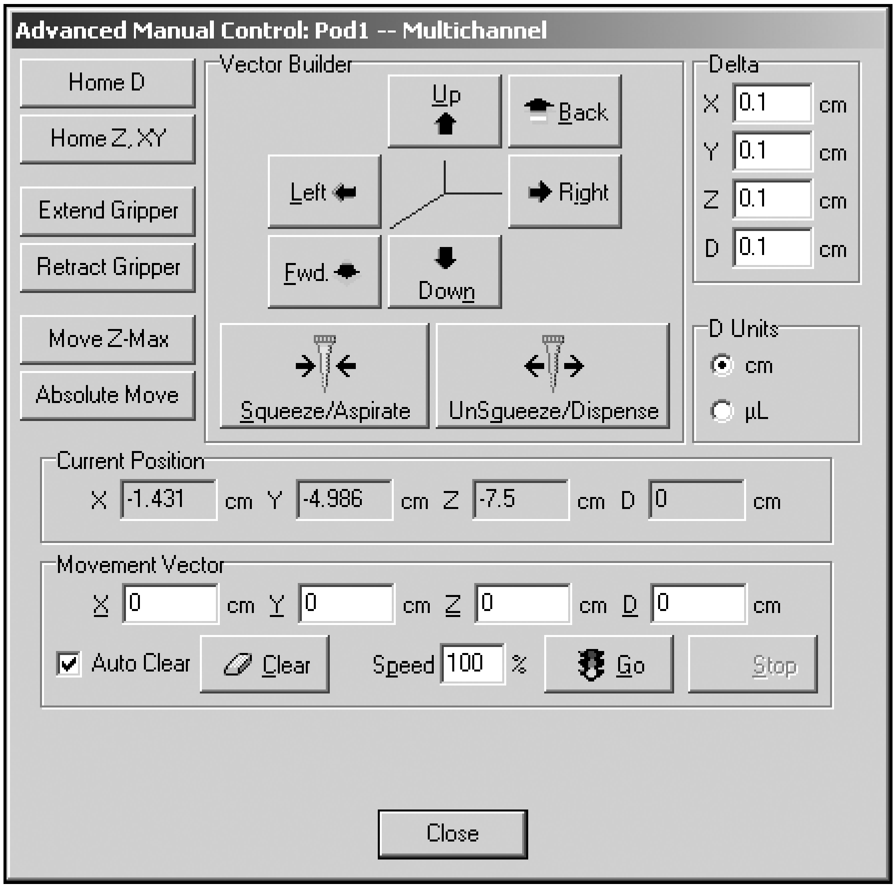
Figure 3-16. Manual Control

2. Select **Advanced Controls** and highlight Pod1 or Pod2. Advanced Manual Control: for the selected Pod appears (Figure 3-18).



...position to move Pod1 to it.

Figure 3-17. Pod1 highlighted in Advanced Controls



Delta
X 0.1 cm
Y 0.1 cm
Z 0.1 cm
D 0.1 cm

D Units
● cm
○ µL

Current Position
X -1.431 cm Y -4.986 cm Z -7.5 cm D 0 cm

Movement Vector
X 0 cm Y 0 cm Z 0 cm D 0 cm

☑ Auto Clear

Speed 100 %

Figure 3-18. Advanced Manual Control for a Multichannel

Note: Advanced Manual Control looks different if the selected pod is a Span-8 Pod.

3. Select **Move Z-Max**. The Multichannel Pod moves to the highest configured height.
4. Select **Close**. Advanced Manual Control closes.
5. From Manual Control, click on **P5**. The Multichannel Pod moves to position P5 on the deck.
6. You can click on additional positions to move the pod to that position. When you are finished moving the pod with Manual Control, choose **Exit** to close Manual Control.
7. From the toolbar, choose **Close** to close the quick-start method.

   OR

   From the File menu, choose **Close**. The method closes and you are now ready to create a method of your own.

3.7 Quick-Start Guide Summary

Congratulations! You’ve just completed this quick-start guide.

You’ve completed:

- a small method
- steps using the editors
- steps to manually control the Biomek FX

If you’ve used the links to other manuals, you’ve also learned where to find hardware information on the Biomek FX, ALPs, and more information on Biomek Software.

Enjoy your new Biomek FX Laboratory Automation Workstation.