GeneAmp® PCR System 2400

Quick Reference Guide

Applied Biosystems

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Contents

1 Introduction

About This Manual

IMPORTANT	*Before using the GeneAmp® PCR System 2400, thoroughly read all the safety information detailed in the Safety and Regulatory Information section in the front of the* GeneAmp® PCR System 2400 User's Manual.

This manual contains abbreviated instructions for operating the GeneAmp ® PCR System 2400 thermal cycler. It is not intended for first time users, but for users already familiar with the System 2400. It gives succinct steps for using most of the instrument's functions.

Revision C of this manual documents enhancements made to version 2.0 of the firmware, including programmable up-ramp rates.

This manual doesn't include tutorial information or some of the more detailed information about sample preparation, instrument maintenance, and troubleshooting. This type of information can be found in *The GeneAmp® PCR System 2400 User's Manual*.

User Attention Words

Please note the following user attention words that appear in this manual:

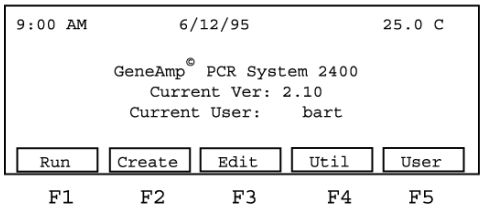
Note	*This word is used to call attention to information.*

IMPORTANT	*This information is given because it is necessary for correct operation of the instrument.*

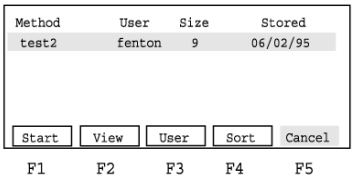
Accessing Functions From the Main Menu

A few seconds after you turn on the instrument, the Main menu appears. You can access all functions of the System 2400 from the Main menu. If you need to return to the Main menu while using other functions, press **F5-Cancel** until it appears.

Main Menu

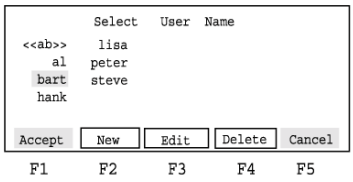


Running Methods



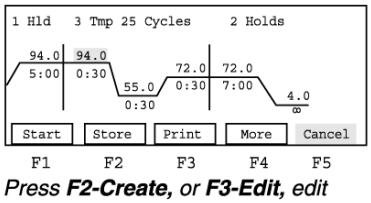
*Press **F1 -Run**, select the method you want to run, press **F1 -Start**.*

Adding Users



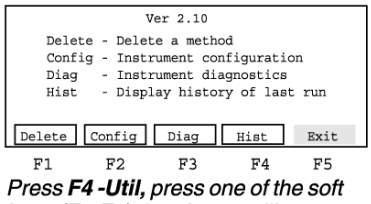
*Press **F5 -User,** press **F2 New**, enter a new user name.*

Creating and Editing Methods



*Press **F2-Create,** or **F3-Edit,** edit the default method, press **F2-Store.***

Using Utilities



*Press **F4 -Util,** press one of the soft keys (F1-F3) to select a utility function.*

Using the Control Panel

The System 2400 control panel consists of a display screen and 22 keys. The display screen shows a graphical representation of PCR events before, during, and after a run. You use the keys to enter information into fields on the display screen.

IMPORTANT	*Before running PCR methods, make sure you have properly loaded the sample tray in the System 2400. This ensures proper operation of the heated cover.*

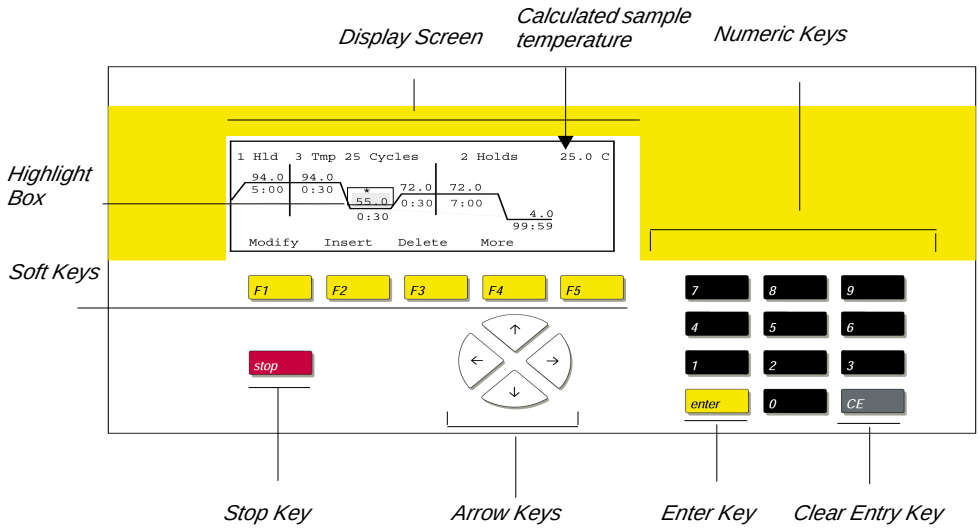


Figure 1-1. The System 2400 control panel

Note	*If the calculated sample temperature exceeds 50˚C, the word HOT flashes in the upper right corner of the display screen.*

Using the Keys

The keys on the control panel have the following functions:

Soft Keys (F1-F5)	Selects the function specified above the key. The function of each key is defined on the display screen above the key, and is redefined as you view different screens.
Stop Key	Stops a method while it is running.
Arrow Keys	Moves the highlight box to different fields on the display screen in the direction of the arrow.
Enter Key	Enters information typed into a field and advances the highlight box to the next field on a screen.
Clear Entry Key (CE)	Removes information from a field.
Numeric Keys	Enters numbers from left to right into a field you highlight.

Selecting a Field

You use the above keys to edit or perform functions on information in *fields*. You select a field by moving the highlight box to it.

There are two ways to select a field:

1. Use the arrow keys to freely move the highlight box in one of four directions.
2. Press the **Enter** key and advance the highlight box to the next field.

Entering Numeric Values

When entering numeric values for temperature control parameters, you do not type decimals or colons. Entered numbers display on the screen from right to left filling across decimal points or colons. For example, to specify 89.0 degrees C, press **8 9 0**, then press **Enter**. Specify all hold times in minutes and seconds, then press **Enter**. For example, to specify one minute and five seconds, press **1 0 5**, then press **Enter.**

A Look at the MicroAmp Disposables

The MicroAmp® disposables you can use to prepare samples for the GeneAmp® PCR System 2400 are shown below in Figure 1-2.

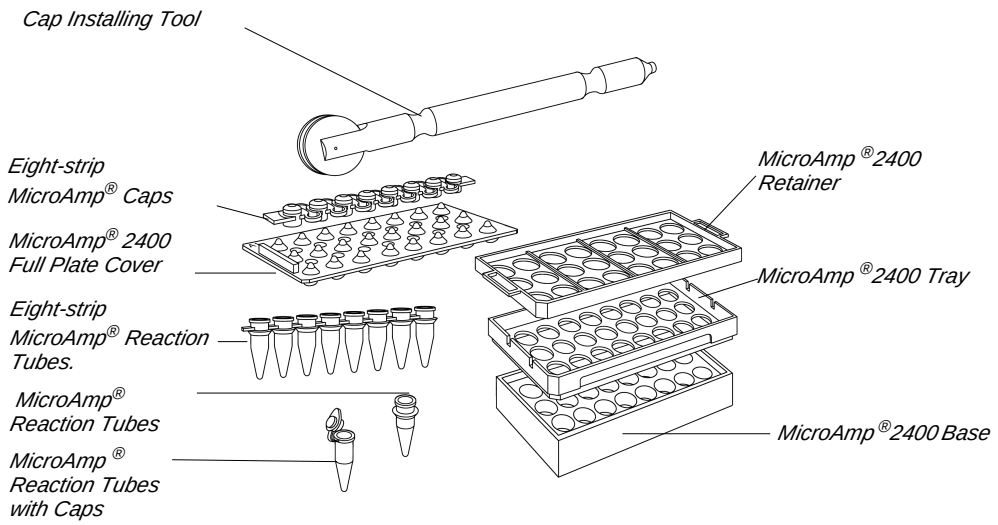


Figure 1-2. MicroAmp disposables for use with the System 2400

For detailed information about the MicroAmp disposables supplied with your instrument, and how to use them for loading and unloading samples, refer to the *GeneAmp PCR System 2400 User's Manual* (P/N 0993-6056).

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Protein Sequencing, Peptide and DNA Synthesis	corelab@appliedbiosystems.com
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LC/MS (Applied Biosystems/MDS Sciex)	apisupport@sciex.com or api3-support@sciex.com
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3	Enter the requested information and your question in the displayed form, then click **Ask Us RIGHT NOW** (blue button with yellow text).
4	Enter the required information in the next form (if you have not already done so), then click **Ask Us RIGHT NOW**. You will receive an e-mail reply to your question from one of our technical experts within 24 to 48 hours.

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2 Running Methods

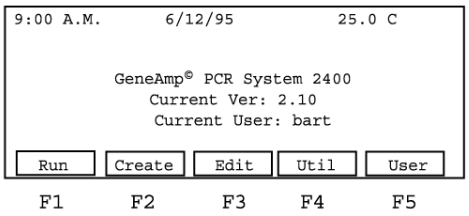


Figure 2-1. The Main menu

The GeneAmp®PCR System 2400 runs PCR samples according to stored methods. You can run methods by:

1. Pressing **F1-Run** from the Main menu (Figure 2-1)
2. Selecting a Method
3. Starting a Run.

Selecting a Method

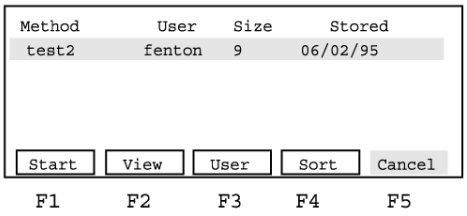


Figure 2-2. The Stored Methods screen

You select a method by moving the highlight box to a method listed on the Stored Methods screen (Figure 2-2). If you need help deciding which method to select you can: view method parameters, sort methods by different categories, or search for a method by user name.

Viewing Method Parameters

Note *There are four predefined methods stored under user <<ab>> that you can select and run, or edit, modify, and store under a new name.*

To view parameters of a method before running:

1. From the Main menu, press **F1-Run.** This displays the Stored Methods screen (Figure 2-2).

2. Press **F2-View.** This displays all the parameters of a method.

   After reviewing pre-PCR, PCR and post PCR parameters of a stored method, you can either press **F1-Start** and start the method, or press **F5-Cancel** and return to the Stored Methods screen (Figure 2-2).

Note *You can not edit parameters from the View Method screen.*

Sorting Methods

If you have a large number of stored methods, you can sort them by name, date last used, date stored and size.

To sort stored methods by different criteria:

1. From the Stored Methods screen, press **F4-Sort**. This displays the Sorting Criteria screen.

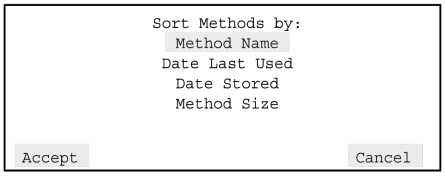


Figure 2-3. The Sorting Criteria screen

2. Use the up and down arrow keys to select the type of sort:
   - `Method Name` sorts methods alphabetically.
   - `Date Last Used` sorts methods chronologically in descending order by date of use (The last method used is listed first).
   - `Date Stored` sorts methods chronologically by date stored (The last method stored is listed first).
   - `Method Size` sorts methods in increasing order by the amount of memory used to store each file (The largest size method is listed first).
3. Press **F1-Accept** to accept a selection. This returns you to the Stored Methods screen where the displayed methods are sorted according to your selection in step 2.

Press **F5-Cancel** to return to the previous screen.

Searching for Methods by User Name

You can find any method that has been stored under a user name.

To search for methods by different user names:

1. From the Stored Methods screen, press **F3-User**. This displays the Search for Methods screen.

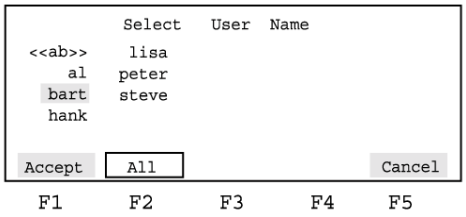


Figure 2-4. The Search for Methods screen

All user names that have methods stored under them, display in a 4 x 5 matrix.

Note	*You can not add, delete, or modify a user name from this screen.*

2. Choose how you want to search for a particular method:

- List the methods of a particular user

  a. Use the arrow keys to select the appropriate user name.

  b. Press **F1-Accept** to accept a selection. This returns you to the Stored Methods screen which now displays the methods of the user you selected.

- List all methods currently stored on the instrument

  - Press **F2-All** to list all methods currently stored on the instrument.

Press **F5-Cancel** to return to the Main menu.

Starting a Run

You can start a run after you select a stored method from the Stored Methods screen (see Figure 2-2).

To start a run:

1. From the Main menu, press **F1-Run** to display stored methods.
2. Use the up and down arrow keys to select the method you want to run.
3. Press **F1-Start**. This displays the Reaction Volume screen (Figure 2-5).

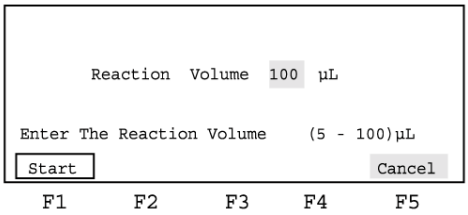


Figure 2-5. The Reaction Volume screen

   a. If the displayed reaction volume is the same as your reaction volume, go to step 4.

   b. If the displayed reaction volume differs from your reaction volume, enter the volume of your reactions (5-100 µL) in the `Reaction Volume` field.

      To clear an entry, press the **CE** key.

4. Press **F1-Start** to start a run. When the heated cover reaches 103˚ C, the Run Time screen displays and the method you selected starts running.

Press **F5-Cancel** to return to the previous screen.

Run Time Screen Profile

The Run Time screen displays the method currently running. You can chart the progress of a run by viewing the Run Time screen at any time during the run. The Run Time screen displays the executing segment, and the next segment to execute (Figure 2-6).

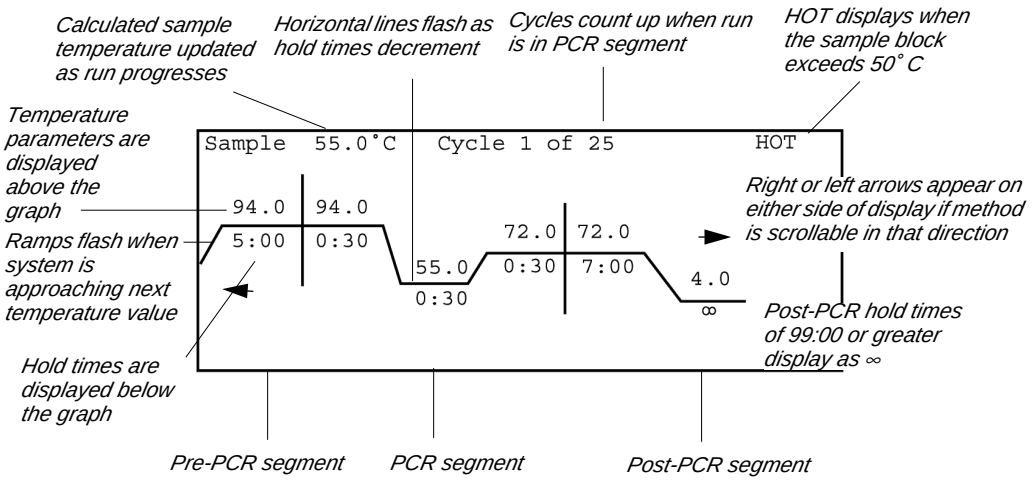


Figure 2-6. Run Time screen profile

From the Run Time screen, you can:

- View method information
- Pause a run
- Stop a run before it completes.

Viewing Method Information

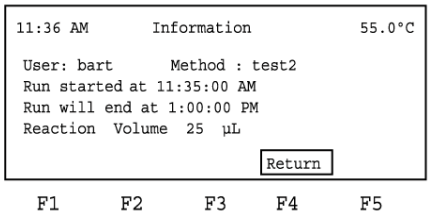


Figure 2-7. The Method Information screen.

At any time during a run, you can display information about the method currently running.

To view information about a method during a run:

1. Start a run.
2. Press **F4-Info.** This displays the Method Information screen(Figure 2-7).

   Press **F4-Return** to return to the Run Time screen.

Pausing a Run

At any time during a run, you can manually pause a run for a ten minute period of time.

Setting the Pause Time Out on page 5-4 describes how to specify a time period for a pause.

To Pause a Run:

1. Start a run.
2. From the Run Time screen, press **F1-Pause.**

For the duration of the pause, your samples will remain at the temperature of the instrument when you paused the run. The time remaining in a pause is displayed at the bottom of the screen in *minutes:seconds* format. It decrements to zero, and the paused run resumes at the point where you paused it.

Press **F1-Pause** again to resume running a method before a pause expires.

Stopping a Run Before it Completes

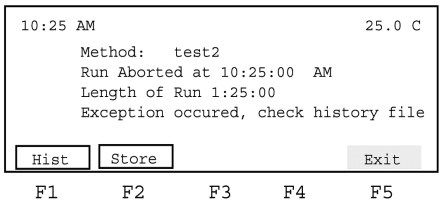


Figure 2-8. The Stop Run screen

The Stop Run screen appears when you stop a run before completion of a method (Figure 2-8).

To stop a run before completion of a method:

1. Press the **Stop** key. This displays a Stop confirmation screen.

   The run pauses for the pre-programmed period of time. When the pause time expires, the run will abort. You can resume the run by pressing **F1-Resume**.

2. Press the **Stop** key again.

   This stops a run and displays the Stop Run screen. At this time you can:

   - Press **F1-Hist** and review the history of the run
   - Press **F5-Exit** and return to the Main menu
   - If you have not yet stored the method that was running, you can press **F2-Store.** This displays the Store screen.

If any errors occur during a run, the message `Exception occurred, check history file` displays. You can review the history file by pressing **F1-Hist** (See Reviewing History of a Run below).

Completing a Run

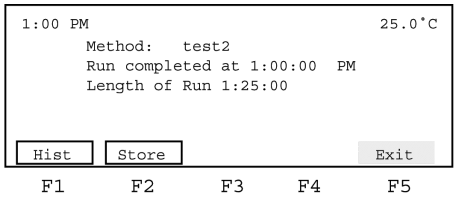


Figure 2-9. The Post Run Screen

When a method completes running, the instrument will beep unless you turned off the beep when configuring the instrument. At completion of a run, the Post Run screen displays(Figure 2-9).

From the Post Run screen, you can perform the same functions as you can after stopping a run.

Reviewing History of a Run

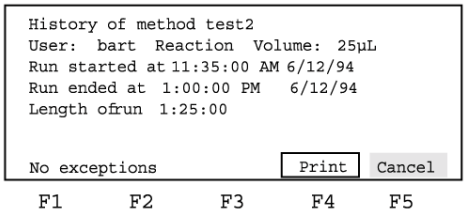


Figure 2-10. The History File screen

You can review a record of the events and errors that occurred during a run by displaying the History File screen (Figure 2-10).

To review the history of a run:

1. From the Stop screen or the Post Run screen, press **F1-Hist** to display the History File screen.
2. Press **F2-PageUp** to page up or **F3-PageDn** to page down through the record.

   If the run completes without any errors or exceptions, then the **PageUp** or **PageDn** soft keys do not display.

To print the record, press **F4-Print**.

Note	*You can only print a record if you have installed and configured a printer.*

Press **F5-Cancel** to return to the previous screen.

3 Adding Users

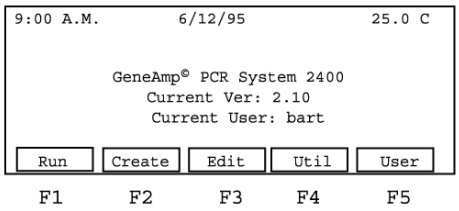


Figure 3-1. The Main menu

The GeneAmp® PCR System 2400 stores methods by user's names. You can add your name to a list of users by:

- Adding a new user name, or
- Editing an existing user name.

Adding a New User Name

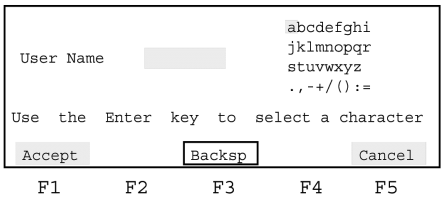


Figure 3-2. The User Name screen

You can add up to 19 different user names to the instrument by:

1. Pressing **F5-User** from the Main menu
2. Entering a user name
3. Protecting your methods.

You can then store methods under user names.

To add a new user name:

1. From the Main menu, press **F5-User**. This displays the Select User Name screen.
2. Press **F2-New.** This displays the User Name screen(Figure 3-2).

Entering a User Name

To enter a user name:

1. In the `User Name` field, enter a alphanumeric name up to six characters in length:
   a. Use the arrow keys to select a character in the list shown in the upper right portion of the screen.
   b. Press **Enter** to put the character in the field.

- Use the numeric keys to type numbers directly into the User Name field.
- Press **F3-Backsp** to go back one space.
- Press the **CE** key to clear an entry.

2. Press **F1-Accept** to accept a name (you must enter at least one character). This displays the Security Code screen (Figure 3-3).

   An error message displays if you enter a name that already exists.

   Press **F5-Cancel** to return to the previous screen without adding the new user name.

Protecting Your Methods

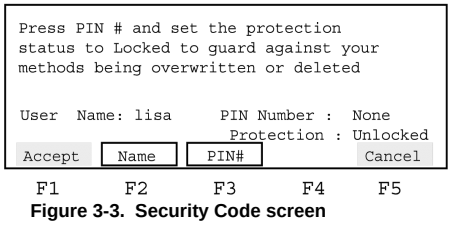


Figure 3-3. Security Code screen

To protect a method, you can enter a Personal Identification Number (PIN) and prevent other users from accidentally overwriting or deleting methods you store under a user name.

To enter a security code:

1. From the Security Code screen, press **F3-PIN#**. This displays the New PIN Number screen (Figure 3-4).

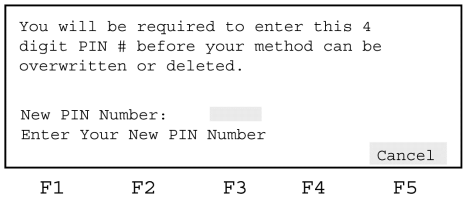


Figure 3-4. The New PIN Number screen

2. In the New PIN Number field, use the numeric keys to enter a four digit PIN number.
3. Press **Enter**. This displays a confirmation screen.
4. Confirm your PIN number by re-entering it as in step 2.
5. Press **Enter**. This displays the Protection Status screen(Figure 3-5).

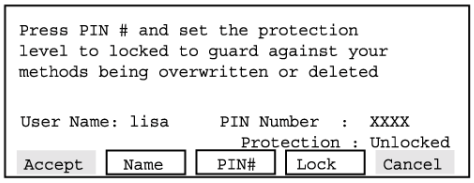


Figure 3-5. The Protection Status screen

6. Press **F4-Lock** to toggle between a Locked and Unlocked state.
7. Press **F1-Accept**. This displays the Select User Name screen(Figure 3-6). The name you entered should display on the screen.

Editing User Names

To add your name to an instrument, you can also edit existing names by changing a user name or, if 19 names have already been entered, by deleting a user name and adding a new name.

Changing a User Name

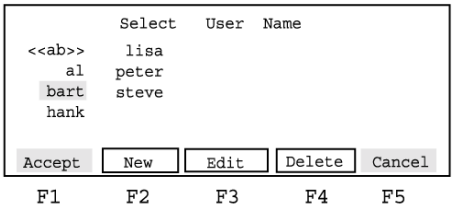


Figure 3-6. The Select User Name screen

If you know the PIN number for a user name, you can use the arrow keys to select a name, and change it.

To change the name of a user:

1. From the Main menu, press **F5-User.** This displays the Select User Name screen (Figure 3-6).
2. Use the arrow keys to select the name you want to change.
3. Press **F3-Edit.** This displays the Security Check screen.
4. Type in the four digit PIN number of the user name you selected.
5. Press **Enter**. This displays the Security Code screen(Figure 3-3).
6. Press **F2-Name** to display the User Name screen (Figure 3-2).

7. Press the **CE** key to clear the previous name.
8. Enter a new user name.
9. Press **F1-Accept**. This displays the Security Code screen again.

   You can either protect your method, or press **F1-Accept** again and accept the new name without a PIN#. This displays the Select User Name screen, showing the changed name.

Deleting a User Name

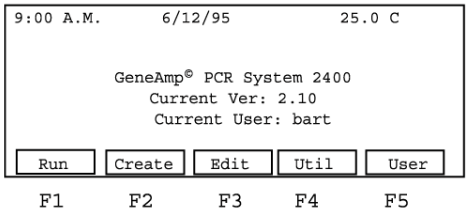
If there are not any methods stored in a directory, you can delete the user name from the Select User Name screen.

To delete a user name:

1. From the Main menu, Press **F5-User.**
2. Use the arrow keys to select a user name.
3. Press **Enter**.
4. Press **F4-Delete** to delete the name.

   This removes the name from the Select User Name screen.

4 Creating and Editing Methods



In the GeneAmp® PCR System 2400, you run all PCR samples according to methods you can Create and Edit by:

1. Pressing **F2-Create** or **F3- Edit** from the Main menu
2. Entering temperature control parameters on the Create screen
3. Storing the method.

Figure 4-1. The Main menu

Creating Methods

The System 2400 comes with a default PCR method. You can run this method, or use it as a template to create a new method (Figure 4-2).

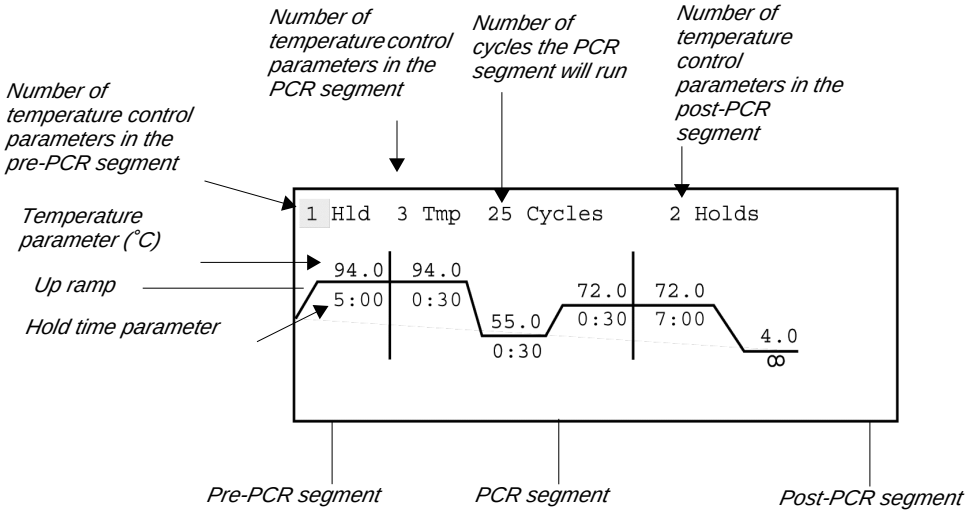


Figure 4-2. Create screen default method

1. From the Main menu, press **F2 -Create**. This displays the Create screen (Figure 4-3).
2. From the Create screen, you can:

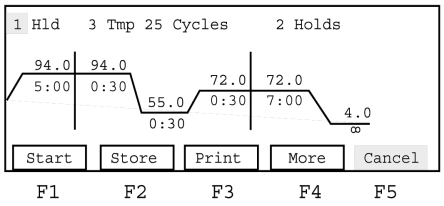


Figure 4-3. The Create screen

- Press **F1-Start** and start running the default method
- Press **F2-Store** and store the method under a user name
- Press **F3-Print** and print the method.

Note	*You can only print a record if you have installed and configured a printer when setting up the instrument.*

- Enter temperature control parameters on the Create screen and create a new method.
- Press **F4-More** to display functions for modifying created methods.

  The **F4-More** key only displays when you select a time or temperature parameter.

- Press **F5-Cancel** to return to the previous screen.

Left and right arrows display on the Create screen when the method exceeds the screen display. To scroll, you can use the arrow keys, or press the **Enter** key repeatedly.

Entering Temperature Control Parameters

When you enter temperature control parameters, you define values for parameters in each of the three segments of a method: pre-PCR, PCR, and post-PCR (Figure 4-2).

You enter all temperature control parameters on the Create screen by selecting fields and using the numeric keys to type in values. Pressing **Enter** accepts a value, and selects fields on the screen.

Defining Pre-PCR Holds

When you first display the Create screen, the `Hld` field is highlighted. The `Hld` field defines the number of holds for the pre-PCR segment of your method.

To define pre-PCR holds:

1. In the `Hld` field, type in the number of pre-PCR holds for your method.
2. Press **Enter** to select the first pre- PCR temperature parameter.
3. Type in a temperature value between 4.0˚ C and 99.9˚ C.
4. Press **Enter** to select the first pre- PCR hold time parameter.
5. Type in a hold time value between 00:00 and 98:59 (*minutes:seconds*).
6. Press **Enter**. This selects the next temperature parameter.
7. Repeat steps 3 through 6 until you have time and temperature values for each of the pre-PCR hold parameters you defined in step 1.

Use the **CE** key to clear an entry.

Press **F5-Cancel** to return to the Main menu.

Defining PCR Parameters

The `Tmp` field on the Create screen defines the number of temperature control parameters in the PCR cycling segment of your method.

To define PCR parameters:

1. Select the `Tmp` field.
2. In the `Tmp` field, type in the number of temperature control parameters (1-6) for one cycle of your method. Three temperature PCR is the typical setting for most PCR reactions.
3. Press **Enter**.

   This selects the `Cycles` field. In this field you specify the number of times you want the PCR cycling segment of your method to run.
4. In the `Cycles` field, type in the number of cycles you want your method to run (2-99). Twenty-five cycles is the default setting.
5. Press **Enter**. This selects the first PCR temperature parameter.
6. Type in a temperature value between 4.0˚C and 99.9˚ C.
7. Press **Enter** to select the first PCR hold time parameter.

8. Type in a hold time value between 00:00 and 98:59 (minutes:seconds).
9. Press **Enter**. This selects the next temperature parameter.
10. Repeat steps 6 through 9 until you have time and temperature values for each of the temperature control parameters you defined in step 2.

Use the **CE** key to clear an entry.

Press **F5-Cancel** to return to the Main menu.

Defining Post-PCR Holds

The `Holds` field on the Create screen defines the number of temperature control parameters in the post-PCR segment of your method.

To define post-PCR holds:

1. Select the `Holds` field.
2. In the `Holds` field, type in the number of post-PCR steps for your method.
3. Press **Enter** to select the first post-PCR temperature parameter.
4. Type in a temperature value between 4.0˚C and 99.9˚ C.
5. Press **Enter** to select the first post-PCR hold time parameter.
6. Type in a hold time value between 00:00 and 98:59 (*minutes:seconds*).

   The hold time ∞ indicates a hold that lasts indefinitely. You can enter a ∞ hold time, by typing a hold time value of 99:00 or greater.
7. Press **Enter**. This selects the next temperature parameter.
8. Repeat steps 4 through 7until you have time and temperature values for each of the post-PCR hold parameters you defined in step 2.

Use the **CE** key to clear an entry.

Press **F5-Cancel** to return to the Main menu.

Modifying Cycles

In addition to customizing values for PCR temperature control parameters, you can use the **More** function on the create screen and access cycle modification functions that allow you to:

- Auto-increment / decrement time and temperature parameters
- Modify up-ramp rates in the cycling segment of a method

- Insert holds, cycles, and programmed pauses
- Delete temperature control parameters.

The time or temperature parameter you select on the create screen, determines which modification function you can access when you Press **F4-More (**Figure 4-4**).**

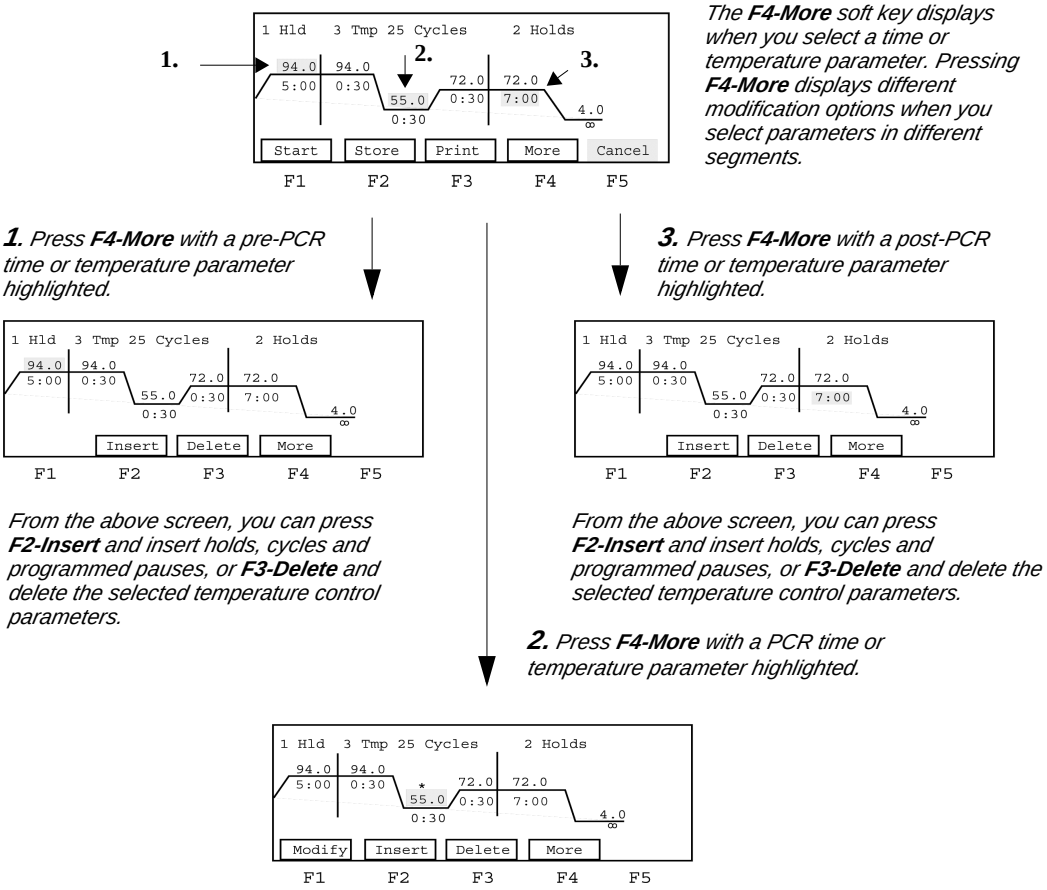


Figure 4-4. Using the More function to modify cycling

Auto-incrementing/decrementing Temperature Control Parameters

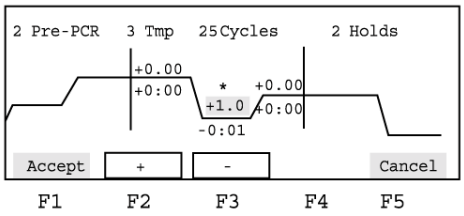


Figure 4-5. The AutoX screen.

Using the AutoX function, you can automatically increase or decrease the values for any PCR segment parameter a fixed amount every cycle.

To auto-increment/decrement PCR parameters:

1. From the Create screen, use the arrow keys to select a time or temperature parameter in the PCR segment.
2. Press **F4-More**. This displays the Modify screen(Figure 4-6).

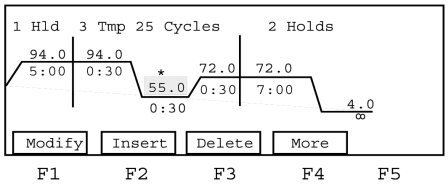


Figure 4-6. The Modify screen

3. Press **F1-Modify**. This displays the Select Modification screen (Figure 4-7).

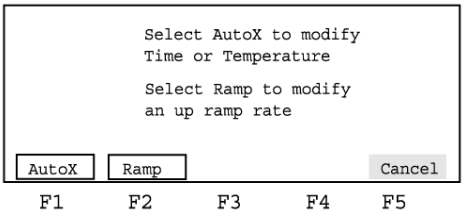


Figure 4-7. The Select Modification Screen

4. Press **F1-AutoX**. This displays the AutoX screen (Figure 4-8).

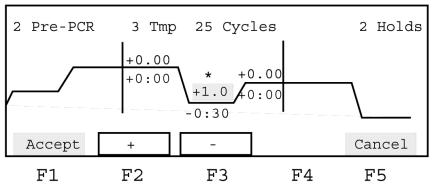


Figure 4-8. The AutoX screen

Note	*If a programmed pause has been inserted, the AutoX screen will display the pause, but you can not modify it from the AutoX screen.*

5. Select the PCR time or temperature parameter that you want modified when you run your method.

Note	*From the AutoX screen, you can* not *modify the* number *of parameters in each segment or the* number *of cycles.*

6. Use the numeric keys to type in the fixed amount that you want the value of the parameter to increase or decrease each time your method completes a cycle.

   Values for times can be between 0:01 and 9:59 (*minutes:seconds*).

   Values for temperatures can be between 0.1 and 9.9˚C.

7. Press **F2 +** to increase the value every cycle. (A plus sign displays in the current field.), or

   Press **F3 —** to decrease the value every cycle. (A minus sign displays in the current field.)

   An asterisk * appears on the AutoX screen and the Modify screen for parameters that will be modified as the method runs.

8. Press **F1-Accept** to accept all entries on the AutoX screen.

Use the **CE** key to clear an entry.

Press **F5-Cancel** to cancel all entries and return to the previous screen.

Modifying Ramp Rates

The ramp time is the time it takes the instrument to change from one temperature to another. Using functions accessible from the Modify screen you can modify the up-ramp rate of the instrument; that is, the rate at which the instrument heats your samples from one temperature setting to the next.

You can decrease up-ramp rates for the cycling segment of a method, by defining the up-ramp rate as a percentage of its maximum rate of increase. The default maximum up-ramp rate is 100%.

To modify up-ramp rates:

1. From the Modify screen, press **F1-Modify**. This displays the Select Modification screen (Figure 4-7).

   2.Press **F2_Ramp**. This displays the Ramp Rate Modification screen (Figure 4-9).

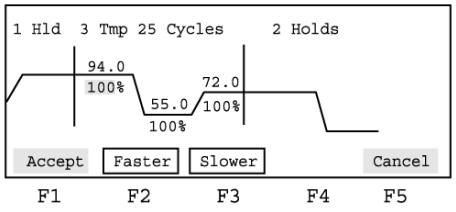


Figure 4-9. The Ramp Rate Modification screen

   For the three temperature cycling method shown in Figure 4-9, you can modify the rate at which the instrument ramps up from 72.0°C to 94.0°C or from 55.0°C to 72.0°C.

3. Use the arrow keys to select an up-ramp that you want to modify.

   If you select a ramp rate value preceded by a higher temperature, you cannot modify the down-ramp rate. Note that ramp modification functions do not display for the F2 or F3 softkeys when a down ramp rate is highlighted (Figure 4-10).

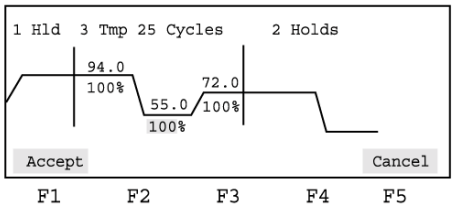


Figure 4-10. Selection of a down-ramp rate

   If you move the highlight box to the third temperature in the cycling segment of the default method, you can modify the highlighted up-ramp rate. The third up-ramp rate defines the rate at which the instrument increaes from 55°C to 72.0°C each time the method cycles (Figure 4-11).

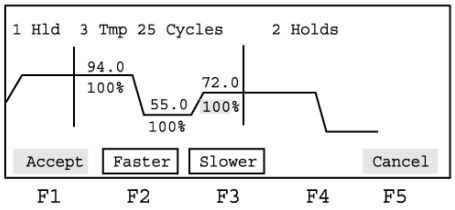


Figure 4-11. Selection of an up-ramp rate

4. Modify the up-ramp rate you selected by defining it as percentage of the maximum of 100%:

   - Press **F2-Faster** to increase the up-ramp rate by 10% up to a maximum of 100%.
   - Press **F3_Slower** to decrease the up-ramp rate by 10% from 100% to 10%, and by 5% from 10% to 5%.
   - Use the numeric keys to enter a value that defines the percentage by which you want to decrease the up-ramp rate for each cycle of the method. You can enter values between 5 and 95, or 100 (Figure 4-12).

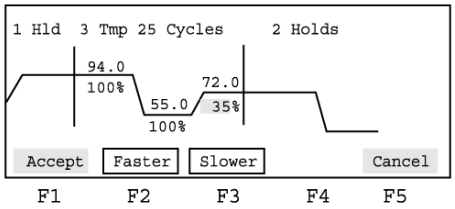


Figure 4-12. Modified up-ramp rate

For ramp rates less than 100%, an asterisk * appears next to modified up-ramps. The asterisk remains beneath the modified temperature parameter to remind you that the method has been modified (Figure 4-13).

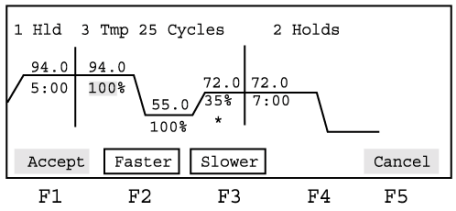


Figure 4-13. Method with modified up-ramp rate

5. Press **F1_Accept** to accept all entries, and return to the previous screen.

Note *If you enter a numeric value outside the range of acceptable values, you will receive the following message:*

```
Valid range is 5 to 95 and 100.
```

Inserting Holds, Cycles, and Programmed Pauses

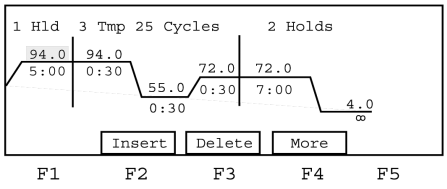


Figure 4-14. Insert screen

From the Insert screen(Figure 4-14), you can insert holds and cycles, and program pauses that the instrument inserts into your method as it runs.

The **Pause** function will not display on the Insert screen if the highlighted segment already has a pre-programmed pause.

To insert holds:

Note	*A ∞ hold can only be inserted as the last hold time in a method.*

1. From the Create screen, use the arrow keys to a select a time or temperature parameter to the right of where you want to insert a hold.
2. Press **F4-More**. Depending on the parameter you select in step 1., one of three screens display from which you can access the insert function (Figure 4-4).
3. Press **F2-Insert.** This displays the Insert screen (Figure 4-14).

Note	*The **Pause** function will not display on the Insert screen if the highlighted segment already has a pre-programmed pause, or if the highlight box is not on a PCR segment parameter.*

4. Press **F1-Hold** to insert a hold of 4.0˚C for 30 seconds to the left of the parameter you selected in step 1

Holds insert to left of selected parameter

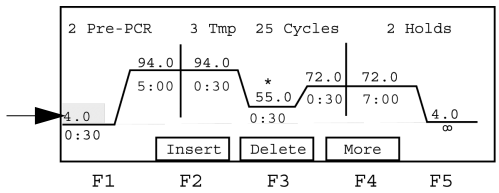


Figure 4-15. Inserted hold

5. Type in a value for the hold temperature.
6. Press **Enter**. This selects the hold time parameter.

7. Type in a value for the hold time.
8. Press **Enter**.
9. Press **F4-More** to return to the Create screen, which now displays your modified method.

Use the **CE** key to clear an entry.

To insert cycles:

1. From the Create screen, use the arrow keys to select a time or temperature parameter to the right of where you want to insert a hold (See Figure 4-4).
2. Press **F4-More**.
3. Press **F2-Insert**. This displays the Insert screen
4. Press **F2-Cycle** to insert a cycle to the left of the segment you selected in step 1(Figure 4-16).

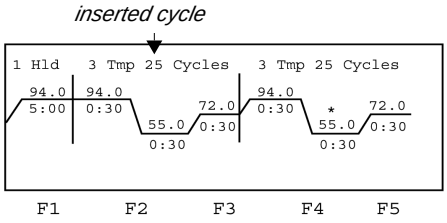


Figure 4-16. Example of Inserted cycle

Use the **CE** key to clear an entry.

Press **F5-Cancel** to cancel your entry and return to the previous screen.

To insert a programmed pause:

1. From the Create screen, use the arrow keys to select a PCR segment time or temperature parameter where you want to insert a programmed pause.
2. Press **F4-More.**
3. Press **F2-Insert.** This displays the Insert screen.
4. From the Insert screen, press **F3-Pause.** This displays the Programmed Pause screen (Figure 4-17).

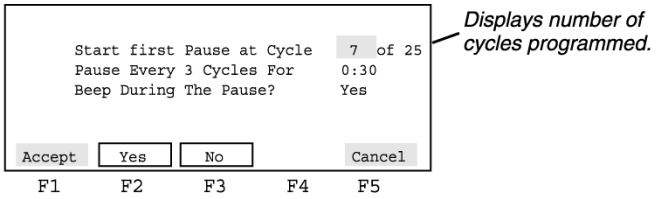


Figure 4-17. The Programmed Pause screen

5. In the `Start 1st Pause at Cycle` field, type in the cycle number where you want the method to first pause(1-98).
6. Press **Enter**. This selects the next field.
7. In the `Pause Every` field, type in the pause frequency in cycles (1-98). The pause frequency specifies the number of cycles that will run between each pause.
8. Press **Enter**. This selects the next field.
9. In the `Cycles For` field, type in the length of the pause in *minutes:seconds* (00:01-98:59) format.
10. Press **Enter**. This selects the next field.
11. In the `Beep During The Pause?` field, press **F2-Yes** or **F3-No**.
12. Press **F1-Accept** to accept the pause information on the screen. The word Pause now displays to the right of the incubation step where you programmed the pause.

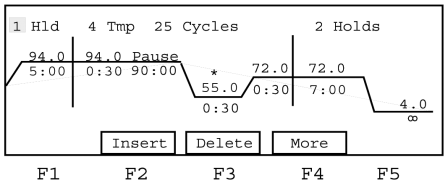


Figure 4-18. Inserted pause

Use the **CE** key to clear an entry.

Note	*Only one pause can be inserted in each cycle.*

Editing Programmed Pauses

If you have inserted a programmed pause in your method, you can edit the parameters for the pause at any time.

To edit programmed pauses:

1. From the Create screen, use the arrow keys to highlight the word Pause. This displays the **F5-Edit** soft key.

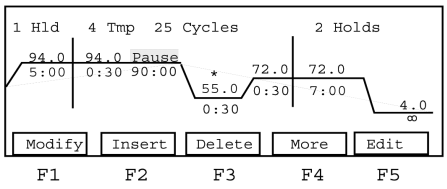


Figure 4-19. Editing programmed pauses

2. Press **F5-Edit** to access the programmed pause screen(Figure 4-17). From this screen you can change any of the pause parameters. Or, use the arrow keys to select the pause time parameter on the screen, and edit it by entering a different time.

Use the **CE** key to clear an entry.

Press **F5-Cancel** to cancel all entries and return to the previous screen.

After you have entered all modifications to the customized method you are creating, you must store the method before running it.

Storing Methods

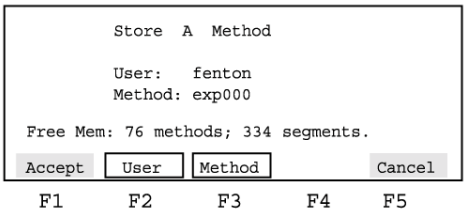


Figure 4-20. The Store screen

Storing a method completes the creation of it. You can store the default method, or modify and then store it.

To store a method:

1. From the Create screen, press **F2-Store.** This displays the Store screen(Figure 4-20).

2. Select a user name where you want to store the method.
   - If you want to store the method under the displayed name, go to step 3.
   - To change the name of the user, press **F2-User**. This displays the Select User Name screen (See Figure 3-6 on page 3-3).
3. Press **Enter** to select the `Method` field.
   - If you want to keep the name of the method as displayed, go to step 4.
   - To change the name of the method, press **F3-Method**. This displays the Stored Method screen (See Figure 2-2 on page 2-1).
4. Press **F1-Accept** to store the method and return to the previous screen.

   Press **F5-Cancel** to return to the previous screen without storing the method.

Editing Methods

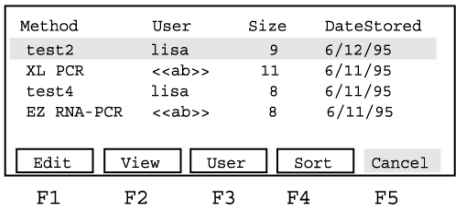


Figure 4-21. The Edit screen.

After you create a method, you can edit the parameters in it and store it by the same name, or change its name. You may also want to delete a method after you create it.

To edit a method:

1. From the Main menu, press **F3-Edit.** This displays the Edit screen (Figure 4-21).
2. Select the method you want to edit:
   a. Press **F2-View** to view the parameters of a method before making a selection (Refer to Section 2, Running Methods, *Viewing Method Parameters).*
   b. Press **F3-User** to search for a method by user name (Refer to Section 2, Running Methods, *Searching for a Method by User Name).*
   c. Press **F4-Sort** to sort methods by different criteria (Refer to Section 2, Running Methods, *Sorting Methods).*
3. Press **F1-Edit**. This displays the Create screen.

4. Edit temperature control parameters.

   Editing temperature control parameters on the Create screen involves the same tasks and uses the same key combinations as creating a method. The same functions for modifying methods are also available (See Creating Methods on page 4-1).

5. Press **F2 Store** and store the method.

Deleting a Method

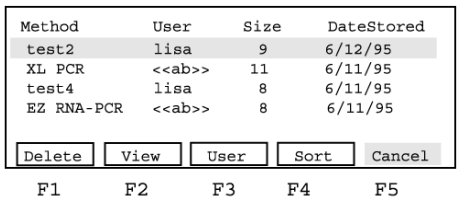


Figure 4-22. The Delete screen

You delete methods from the Delete screen. You access the Delete screen from the Main menu by pressing **F4- Util**.

To delete a method:

1. From the Main menu, press **F4-Util.** This displays the Utilities screen.
2. From the Utilities screen, press **F1-Delete** to display the Delete screen (Figure 4-22).
3. Select one of the methods displayed on the screen, or select another method as follows:
   - Press **F2-View** to view method parameters (Refer to Section 2, Running Methods, *Viewing Method Parameters).*
   - Press **F3-User** to search for a method by user name (Refer to Section 2, Running Methods, *Searching for Methods by User Name).*
   - Press **F4-Sort** to sort methods by different criteria (Refer to Section 2, Running Methods, *Sorting Methods).*
4. Press **F1-Delete.** This displays the Delete Confirmation screen.

   If the method is protected, enter the four digit PIN number and press **F1-Accept** when the number is correct.
5. Press **F1-Yes** to confirm the deletion. This deletes the method and returns you to the Delete screen.

Press **F5-Cancel** at any time during the delete process to return to the previous screen.

5 Using Utilities

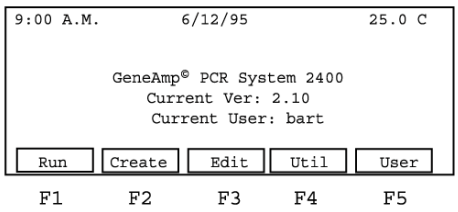


Figure 5-1. The Main menu

You can access all utility functions by pressing **F4-Util** on the Main menu. By using utilities you can:

1. Delete a method
   (discussed in the previous section)
2. Configure the instrument
3. Run diagnostic tests
   (discussed in the *User's Manual*)
4. Review the history of the last run
   (discussed in the previous section).

Configuring the Instrument

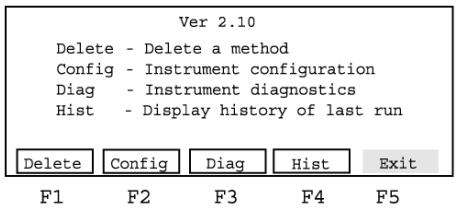


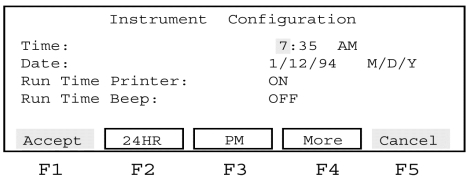
Figure 5-2. The Utilities screen

Configuring the instrument involves setting values for operating parameters and enabling or disabling optional features.

To configure the instrument:

1. From the Main menu, press **F4-Util.** This displays the Utilities screen (Figure 5-2).
2. Press **F2-Config**. This displays the First Configuration screen (Figure 5-3).

Setting the Time



From the First Configuration screen, you can set the current time and date for file memory maintenance, and run time displays, and enable or disable the run time printer and the run time beep.

When all the values on the screen are correct, press **F1-Accept.**

Figure 5-3. The First Configuration screen

To set the time:

1. Select the `Time` field.

   The **F2** and **F3** soft keys provide a three-way toggle that allows you to define the format of the time in AM, PM, or 24 hour format. Whatever format is displayed for the `Time` field, the **F2** and **F3** soft keys define the other two formats. For example:

If the `Time` field is...	Then **F2=**	Then **F3=**
24	AM	PM
AM	24	PM
PM	AM	24

2. Press the **F2** or **F3** soft keys until the format you want for the current time displays in the `Time` field.
3. Use the numeric keys to type in the hours followed by minutes.
4. Press **Enter** to accept the entry.

CE clears an entry.

Press **F5-Cancel** to cancel all entries and return to the previous screen.

Setting the Date

To set the date:

1. Select the `Date` field.

   There are three fields to set in the `Date` field: the *days* field, the *month* field and the *year* field.

   The **F2** and **F3** soft keys provide a three-way toggle that allows you to define the format of the date as **D/M/Y** (*day:month:year)*, **Y/M/D** (*year:month day)*, or **M/D/Y**. For example:

If the `Date` field is...	Then **F2=**	Then **F3=**
Y/M/D	D/M/Y	M/D/Y
D/M/Y	Y/M/D	M/D/Y
M/D/Y	D/M/Y	Y/M/D

2. Press the **F2** or **F3** soft keys until the format you want for the current date displays in the `Date` field.
3. Use the numeric keys and type in a number for each of the three fields: *days*,*months*, and *years*, pressing **Enter** after each entry. The order of these three fields depends on the format you chose in step 2.

CE clears an entry.

Press **F5-Cancel** to cancel all entries and return to the previous screen.

Enabling or Disabling the Optional Printer

Enabling the printer allows you to print method parameters or records of run time events directly from the display screen.

The default value for the optional printer is `Off`.

To enable or disable the optional printer:

1. Select the `Run Time Printer` field. This changes the functions of the **F2** and **F3** soft keys.
2. Press **F2-On** to enable the printer or **F3-Off** to disable it.
3. Press **Enter** to accept your entry.

Press **F5-Cancel** to cancel all entries and return to the previous screen.

Turning the Beep On or Off

When turned on, the run time beeper beeps during a pause and once at the completion of a run.

The default value is `Off`.

To turn the run time beep on or off:

1. Select the `Run Time Beep` field. This changes the value of the **F2** and **F3** soft keys.
2. Press **F2-On** to turn the beeper `On` or **F3-Off** to turn it `Off`.

Press **F5-Cancel** to cancel all entries and return to the previous screen.

Setting the Pause Time Out

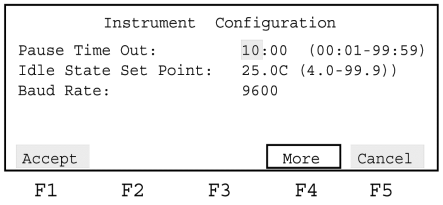


Figure 5-4. The Second Configuration screen

The `Pause Time Out` field sets the time in *minutes:seconds* format for the length of a manual pause.

You set the `Pause Time Out` field from the Second Configuration screen. From this screen, you can also define:

1. The idle state setpoint temperature.
2. The printer port.

To set the pause time out:

1. From the First Configuration screen, press **F4-More**. This displays the Second Configuration screen(Figure 5-4).
2. Use the numeric keys and type in the minutes followed by the seconds for the `Pause Time Out`.
3. Press **Enter**. This accepts your selection and selects the `Idle State Set Point` field.

   CE clears an entry.

Defining the Idle State Setpoint Temperature

The idle state setpoint temperature is the temperature the instrument will remain at when powered up and idle.

Note	*After a run completes or is terminated, there is approximately a 30 second delay before the instrument attains the specified idle state temperature. This allows you to stop one method and start another before the instrument temperature changes.*

To set the idle state setpoint temperature:

1. Select the `Idle State Set Point` field.
2. Use the numeric keys and type in a temperature between 4.0˚C and 99.9 ˚C.

   CE clears an entry.
3. Press **Enter** to accept your entry.

Defining the Baud Rate for your Printer Port

Define the printer port value in the `Baud Rate` field.

To set the baud rate:

1. Select the `Baud Rate` field.
2. Press **F2-Up** or **F3-Down** to increase or decrease the baud rates. Available baud rates are 19200, 9600, 4800, 2400, 1200, 600, and 300.
3. Press **Enter** to accept your entry.

Index

N

O

P

R

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