*Release Information*

| Manual Part No. | Manual Version |
|---|---|
| 0993-8984 | B |

# DNA Thermal Cycler 480

## Quick Reference Guide

**AB** Applied Biosystems

*There are three main functions of the software that you can access after you turn on the DNA Thermal Cycler 480.*

## 1    Access a Default File

Access a default file to customize, store, or run a PCR file and method.

### To access File #1, the Soak file
(see pages 2,3)

Press [ File ] *then press* [ 1 ] *then press* [ Enter ] →
```
SOAK FILE
STEP to edit file #1
```

### To access File #2, the Time Delay file
(see pages 2,3)

Press [ File ] *then press* [ 2 ] *then press* [ Enter ] →
```
TIME DELAY FILE
STEP to edit file #2
```

### To access File #3, the Thermo-Cycle file
(see pages 2,4)

Press [ File ] *then press* [ 3 ] *then press* [ Enter ] →
```
THERMO-CYCLE FILE
STEP to edit file #3
```

### To access File #4 the Step-Cycle file
(see pages 2,5)

Press [ File ] *then press* [ 4 ] *then press* [ Enter ] →
```
STEP-CYCLE FILE
STEP to edit file #4
```

## 2    Get to the File Directory

Review a directory of all or some of your PCR files.

(see page 6)

Press [ File ] *then press* [ Enter ] →
```
File Directory
ALL-BY TYPE-BY USER
```
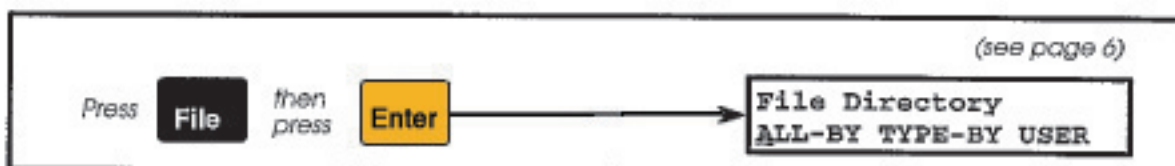
## 3    Get to the Configuration and Diagnostic Files

Perform two configuration tasks and run seven diagnostic tests.

(see page 9)

Press [ File ] *then press* [ Yes ] →
```
Select Function
CONFIG-DIAGNOSTIC
```
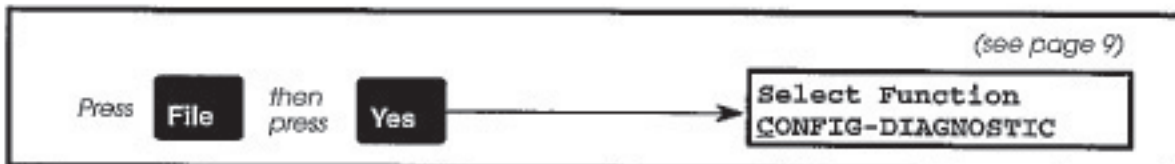
# The Incubation Files

### Soak File #1

Soak files hold a single temperature until you abort the run.
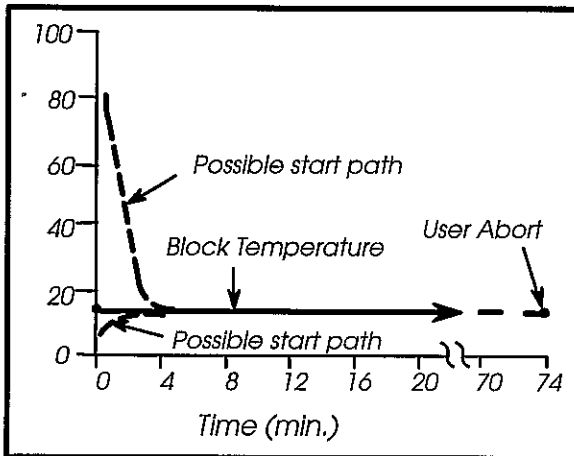


### Time Delay File #2

Time Delay files hold a single temperature for a specified period of time.
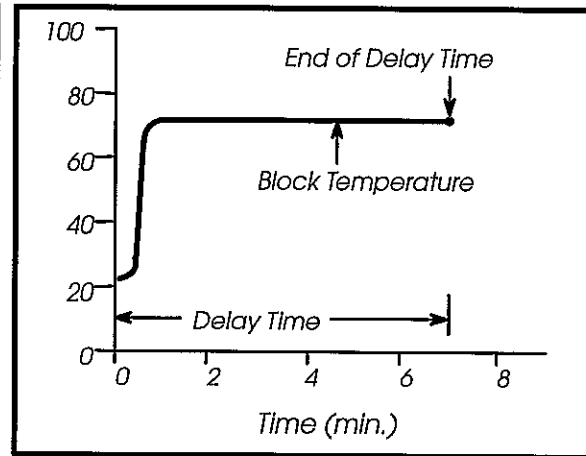


# The Cycle Files

### Thermo-Cycle File #3

Thermo-Cycle files contain programmed thermal transitions and thermal plateaus for PCR cycling. You can also select the Auto Segment Extension feature.
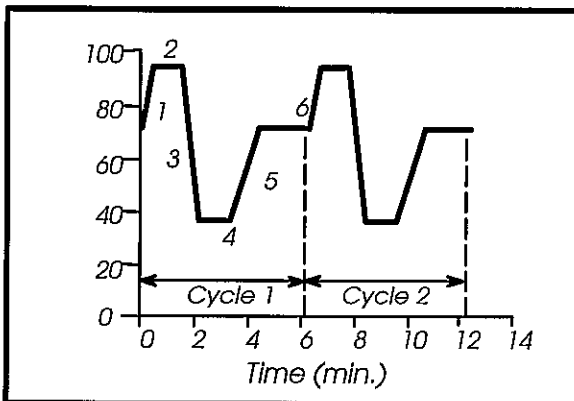


### Step-Cycle File #4

Step-Cycle files contain programmed thermal plateaus for PCR cycling. You can also select the Auto Segment Extension feature.



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## How to Customize a Soak File, File #1

```
SOAK FILE
STEP to edit file #1
```
This is the first display in the Time Delay file.
Press **STEP** to edit the first parameter.

```
Soak temperature
(-5 to 100)      25 °C
```
Enter the desired soak temperature.

- Press **STEP** to accept a default value and move to the next display.
  Or, to change a value and move to the next display, use the numeric keys then press **ENTER**.

```
End of file
RUN-STORE-PRINT
```
Press **NO** to select one of the options, then **ENTER**.
Press **STOP** to return to the first display in the file.

## How to Customize a Time Delay File, File #2

```
TIME DELAY FILE
STEP to edit file #2
```
This is the first display in the Time Delay file.
Press **STEP** to edit the first parameter.

Enter the desired delay time and temperature.

```
Delay Time
(0-999)     7min 0sec
```
```
Delay Temperature
(-5 to 100)      72 °C
```
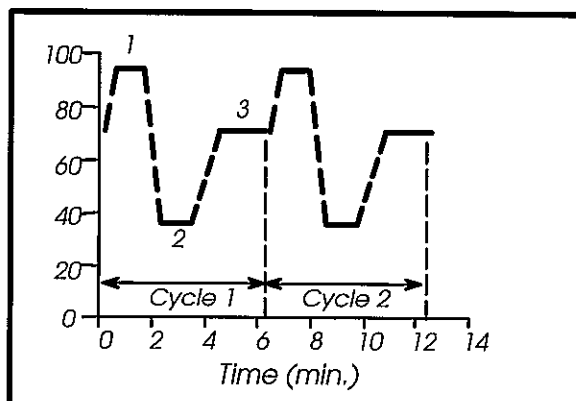- Press **STEP** to accept a default value and move to the next display or parameter.
  Or, to change a value and move to the next display or parameter, use the numeric keys then press **ENTER**.

- Press **HELP** to move to the previous parameter.

- Press **STOP** to move to the last display in the file.

```
Beep while Delay
NO-YES
```
Choose YES to turn on a beeper, which will sound while the file is running, by pressing **NO**, then **ENTER**;
Or, press **ENTER** to choose NO.

```
Link to stored file
(0-99, 0=SHUT-OFF) 0
```
Enter the file number of the file you wish to link to in a method, then **ENTER**, or press **STEP** to accept the default link to shut-off.

```
End of file
RUN-STORE-PRINT
```
Press **NO** to select one of the options, then **ENTER**.
Press **STOP** to return to the first display in the file.

# How to Customize a Thermo-Cycle File, File #3

```
THERMO-CYCLE FILE
STEP to edit file #3
```

This is the first display in the Thermo-Cycle file.
Press **STEP** to edit the first parameter.

```
Seg 1      Target Temp
(-5 to 100)      94°C
```

```
Seg 1     Segment Time
(0-999)       0min 1sec
```

Enter the desired temperatures and times for Segments #1, 2. 3, 4, 5, and 6. Odd-numbered segments are thermal transitions and even-numbered segments are thermal plateaus.

- Press **STEP** to accept a default value and move to the next display or parameter.
  Or, to change a value and move to the next display or parameter, use the numeric keys then press **ENTER.**

- Press **HELP** to move to the previous parameter.

- Press **STOP** to move to the last display in the file.

```
Seg 7      Target Temp
(-5 to 100)       0°C
```

```
Seg 7     Segment Time
(0-999)       0min 0sec
```

Segment #7 is the terminating segment in the file and must have a time and temperature of zero. The terminating segment marks the end of one cycle.

- Press **STEP** to accept a default value and move to the next display or parameter.
  Or, to change a value and move to the next display or parameter, use the numeric keys then press **ENTER.**

- Press **HELP** move to the previous parameter

```
Auto Seg. Extension
NO-YES
```

Choose YES to automatically extend any segment by pressing **NO**, then **ENTER**. Then enter the number of the segment you wish to extend (usually 6) and the extension time per cycle in seconds;
Or, press **ENTER** to choose NO.

```
Cycle Count
(1-99)            25
```

Enter the number of cycles you wish to run. Use the numeric keys and **ENTER** to change the value, or press **STEP** to accept the default value.

```
Link to stored file
(0-99, 0=SHUT-OFF) 0
```

Enter the file number of the file you wish to link to in a method, then **ENTER**, or press **STEP** to accept the default link to shut-off.

```
End of file
RUN-STORE-PRINT
```

Press **NO** to select one of the options, then **ENTER**.
Press **STOP** to return to the first display in the file.

# How to Customize a Step-Cycle File, File #4

```
STEP-CYCLE FILE
STEP to edit file #4
```

This is the first display in the Step-Cycle file.
Press **STEP** to edit the first parameter.

*Enter the desired temperatures and times for
Segments #1, 2. and 3, which are thermal plateaus:*

```
Seg 1      Target Temp
(-5 to 100)       94°C
```
```
Seg 1      Segment Time
(0-999)       1min 0sec
```

- *Press **STEP** to accept a default value and
  move to the next display or parameter.
  Or, to change a value and move to the next
  display or parameter, use the numeric keys then
  press **ENTER**.*

- *Press **HELP** to move to the previous parameter*

- *Press **STOP** to move to the last display in the file.*

```
Seg 4      Target Temp
(-5 to 100)        0°C
```
```
Seg 4      Segment Time
(0-999)       0min 0sec
```

*Segment #4 is the terminating segment in the file
and must have a time and temperature of zero. The
terminating segment marks the end of one cycle.*

- *Press **STEP** to accept a default value and
  move to the next display or parameter.
  Or, to change a value and move to the next
  display or parameter, use the numeric keys then
  press **ENTER**.*

- *Press **HELP** move to the previous parameter*

```
Auto Seg. Extension
NO-YES
```

*Choose YES to automatically extend any segment by
pressing **NO**, then **ENTER**. Then enter the number of
the segment you wish to extend, and the extension
time per cycle in seconds.
Or, press **ENTER** to choose NO.*

```
Cycle Count
(1-99)              25
```

*Enter the number of cycles you wish to run. Use
the numeric keys and **ENTER** to change the
value, or press **STEP** to accept the default value.*

```
Link to stored file
(0-99, 0=SHUT-OFF) 0
```

*Enter the file number of the file you wish to link to in a
method, then **ENTER**, or press **STEP** to accept the de-
fault link to shut-off.*

```
End of file
RUN-STORE-PRINT
```

*Press **NO** to select one of the options, then **ENTER**.
Press **STOP** to return to the first display in the file.*

# How to Store a Customized User File

Use these instructions to store your customized user files.

| | |
|---|---|
| **End of file**<br>**RUN-STORE-PRINT** | *When the last display in your customized file appears, press **NO** to select the STORE option, then press **ENTER**.* |
| **File Store**<br>**Enter User #1031** | *Assign a one- to four-digit User Number (0 to 9999) to your customized file by using the numeric keys and **ENTER**.*<br>• *Assign the same user number to a group of files.*<br>• *We suggest using your birthday, in the month-day format, for your user number.* |
| **File Store**<br>**Enter File #7** | *Assign a one- or two-digit File Number (7 to 99) to your customized file by using the numeric keys and **ENTER**.*<br>• *Use this number for direct access to your customized file anytime in the future. In this example, you would press **FILE, 7**, then **ENTER**.* |
| **Yes to store**<br>**User #1031 File #7** | *Press **YES** to store your file. In this example, we assigned User #1031 and File #7 to our customized file.* |

# How to Use the File Directory

Use the File Directory to view all or some of the stored files.

| | |
|---|---|
| **File Directory**<br>**ALL-BY TYPE-BY USER** | *Press **NO** to select the kind of directory you wish to view, then press **ENTER**.* |
| | *This option lets you view all user files with the same user number.* |
| | *This option lets you view all files of a specific type. For example, all Soak files, all Time Delay files, etc.* |
| | *This option lets you view all stored files in numerical order (by file number)* |

# How to Run a File

Use these instructions to run any file. You can run a file even if you haven't stored it yet.

---

1. Access the desired file by pressing **FILE**, the desired file number, then **ENTER**.

2. Press the **START** key.

3. If you have configured your instrument for use with a printer, use the **NO** key to select a print mode, then press **ENTER**.

4. The run begins.

**or**

1. From the last display in a file, press **ENTER** when the cursor is positioned under the RUN option.

2. If you have configured your instrument for use with a printer, use the **NO** key to select a print mode (OFF, CYCLE, or SEGMENT), then press **ENTER**

3. The run begins.

---

## Run-Time Displays for Cycle Files

While a file is running, a display with information about the run appears. The following example shows the run-time displays for a Thermo-Cycle and a Step-Cycle file run.



Current block temperature

Time remaining in current segment

Press

```
Blk= 96°C Time   0:46
End= 96°C  Cycles=24
```

Help

Number of Current Segment

Total number of cycles in the file

```
Seg# 1    Tot.Cyc.=25
Len.=   1:50  File# 7
```

Programmed target temperature for current segment

Cycles remaining

to toggle between the two run-time displays

Programmed total hold time of current segment

Current file number

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## How to Create a Method

A method is a series of files linked together in a specific sequence. To create a method:

1. *Edit or create the first file in the sequence.*
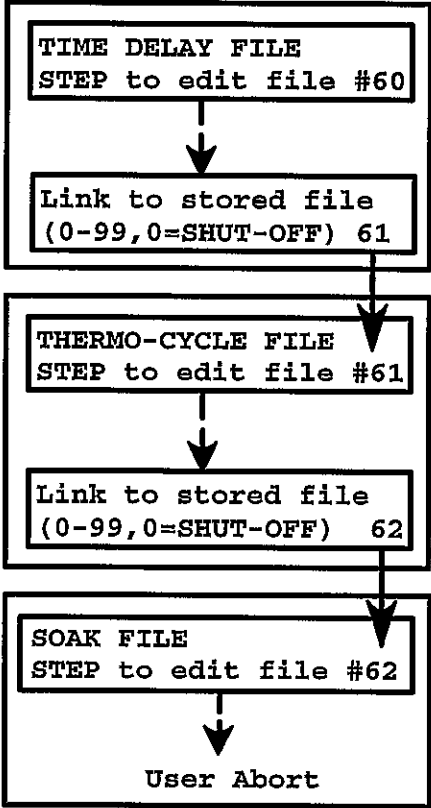
   *Link this file to the file number of the second file in the sequence, using the "Link to stored file" parameter..*

2. *Store the file. Remember to assign the correct file number.*

3. *Edit or create the second file in the sequence.*

   *Link this file to the file number of the third file in the sequence.*

4. *Edit or create the third file in the sequence.*

   *Link the file to shut-off if it is the last file in the method, unless the last file in the method is a Soak file, in which case you will have to manually abort the run.*

5. *Store the file. Remember to assign the correct file number.*

## How to Run a Method

1. *Run the first file in the method.*

2. *When that file has been run, the second file in the method will run automatically.*

3. *When the second file has been run, the third file in the method will run automatically.*

4. *When the last file in the method has been run, temperature control will end and the block temperature will drift to ambient.*

```
┌─────────────────────────┐
│ TIME DELAY FILE         │
│ STEP to edit file #60   │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ Link to stored file     │
│ (0-99,0=SHUT-OFF) 61    │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ THERMO-CYCLE FILE       │
│ STEP to edit file #61   │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ Link to stored file     │
│ (0-99,0=SHUT-OFF)   62  │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ SOAK FILE               │
│ STEP to edit file #62   │
└─────────────────────────┘
            │
            ▼
      User Abort
```

In the example method on the right, File #60, a pre-PCR cycle incubation Time Delay file, was linked to File #61, a Thermo-Cycle file. This file was linked to File #62, a post-PCR cycle incubation file. Soak files run indefinitely until aborted by the user.

# The Configuration File

This file contains the two configuration parameters.

| | |
|---|---|
| **Select Function**<br>**CONFIG-DIAGNOSTIC** | *Press ENTER to access the Configuration file.* |
| **User Configuration**<br>**STEP to edit** | *Press STEP to edit the first configuration parameter.* |
| **Pause Time-out limit**<br>**(9-999)        99sec** | *The pause time-out limit is the time at which a manually paused run will automatically abort.*<br><br>• *Press STEP to accept a default value and move to the next display.*<br>*Or, to change a value and move to the next display, use the numeric keys then press ENTER.*<br><br>• *Press HELP to move to the previous display.* |
| **Printer Mode**<br>**OFF-ON** | *Press NO to select the ON option then press ENTER to configure your instrument for printer output.*<br>*Or, press STEP to select the OFF option if you are not using a printer.* |
| **End of config. file**<br>**STEP to continue** | *Press STEP to re-edit the first configuration parameter.*<br>*Press STOP to exit the file.* |

# The Diagnostic File

This file contains six diagnostic tests.

---

```
Select Function
CONFIG-DIAGNOSTIC
```

Press **NO** to select DIAGNOSTIC, then press **ENTER** to access the tests in the Diagnostic file.

```
Diagnostic Tests
Enter test #     (1-6)
```

Use the numeric keys and **ENTER** to select the test you wish to run:

**Test #1** - Display/Keypad Test

**Test #2** - Delete User Files (This test deletes ALL user files.)

**Test #3** - Heater Test

**Test #4** - Chiller Test

**Test #5** - Overshoot Test

**Test #6** - Undershoot Test

---

## Using the Keypad

| To Do This | Press This Key |
|---|---|
| Start a run from the first display in the file | **Start** |
| View the next display or parameter in a file<br><br>Accept a default value or condition and move to the next parameter in a file | **Step** |
| While editing a file, view the previous display parameter<br><br>While running a file, toggle between the two run-time displays | **Help** |
| While editing a file, move to the last display in the file | **Stop** |
| Pause a run in progress | **Stop** |
| Abort a run in progress | **Stop** **Stop** |
| Access a file (for example, File #4) | **File** **4** **Enter** |
| Get to the File Directory | **File** **Enter** |
| Get to the Configuration and Diagnostic Files | **File** **Yes** |
| Delete an individual file from the first display in that file | **File** **Clear** |
| Enter numerical values | **0** to **9** , **Enter** |
| Erase numerical values not yet entered | **Clear** |
| Move the screen cursor to the next option in a hyphenated list on a display | **No** |
| Accept a selection | **Enter** |

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|---|---|---|
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|---|---|---|
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| | 1-800-899-5858, and press 1, then press 6 | 508-383-7855 |
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| by phone from the United States or Canada | a. Call 1-800-487-6809 from a touch-tone phone. Have your fax number ready.<br><br>b. Press **1** to order an index of available documents and have it faxed to you. Each document in the index has an ID number. (Use this as your order number in step "d" below.)<br><br>c. Call 1-800-487-6809 from a touch-tone phone a second time.<br><br>d. Press **2** to order up to five documents and have them faxed to you. |
| by phone from outside the United States or Canada | a. Dial your international access code, then 1-858-712-0317, from a touch-tone phone.<br><br>Have your complete fax number and country code ready (011 precedes the country code).<br><br>b. Press **1** to order an index of available documents and have it faxed to you. Each document in the index has an ID number. (Use this as your order number in step "d" below.)<br><br>c. Call 1-858-712-0317 from a touch-tone phone a second time.<br><br>d. Press **2** to order up to five documents and have them faxed to you. |

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