ABI PRISM™ 6700 Automated Nucleic Acid Workstation

User Guide

Applied Biosystems

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Glossary

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1 Introduction

Overview

About This Chapter

This chapter describes the organization of this User Guide. It also includes safety information and a limited warranty statement for the ABI PRISM™ 6700 Automated Nucleic Acid Workstation.

In This Chapter

This chapter contains the following topics:

Topic	See Page
6700 Workstation Manuals	1-2
Limited Warranty Statement	1-3
Safety	1-4

6700 Workstation Manuals

6700 Workstation Manual Set

The manuals for the 6700 workstation are described below.

Title	Part Number	Description
ABI PRISM 6700 Automated Nucleic Acid Workstation Site Preparation and Safety Guide	4304419	This manual contains installation requirements, an installation checklist, and information about instrument and chemical safety.
ABI PRISM 6700 Automated Nucleic Acid Workstation User Guide	4304309	This manual contains a detailed description of instrument operation.
Database Administration Guide for the ABI PRISM 6700 Automated Nucleic Acid Workstation	4314342	This manual contains information about maintaining the 6700 database and managing database users. **Note** This manual is intended for the Database Administrator.

Purpose of This User Guide

This User Guide describes the ABI PRISM 6700 Automated Nucleic Acid Workstation and contains procedures for operating, maintaining, and testing this instrument.

Contents of This User Guide

The table below describes the contents of this User Guide.

Chapter/Appendix	Topics
Chapter 2 System Description	This chapter describes the components of the 6700 workstation: the instrument, the computer hardware and accessories, and the software.
Chapter 3 Instrument Operation	This chapter describes how to log in to the 6700 workstation software, set up a run, set up the deckspace, and start the run.
Chapter 4 Protocol Creation	This chapter describes the 6700 workstation protocols and contains procedures for defining protocols.
Chapter 5 Maintenance	This chapter describes the maintenance schedules and procedures for the 6700 workstation.
Chapter 6 Function Tests and Instrument Calibration	This chapter describes function tests and instrument calibration and contains procedures for performing them.
Appendix A Instrument Decontamination	This appendix provides information for decontaminating the 6700 instrument.
Appendix B 6700 Workstation Materials	This appendix contains descriptions and part numbers of consumables and reagents designed for use on the 6700 workstation.
Appendix C Troubleshooting	This appendix contains troubleshooting information and a list of common error messages.
Appendix D References	This appendix contains a bibliography of references cited in this manual.
Appendix E Technical Support	This appendix provides information for contacting Applied Biosystems via telephone, fax, or Internet.

Limited Warranty Statement

Applera Corporation Limited Warranty Statement

Applera Corporation warrants to the customer that, for a period ending on the earlier of 1 year from the completion of installation or 15 months from the date of shipment to the customer (the “Warranty Period”), the ABI PRISM™ 6700 Automated Nucleic Acid Workstation purchased by the customer (the “Instrument”) will be free from defects in material and workmanship, and will perform in accordance with the functional test specifications set forth in the Installation Worksheet (the “Specifications”).

During the Warranty Period, if the Instrument's hardware becomes damaged or contaminated or if the Instrument otherwise fails to meet the Specifications, Applera Corporation will repair or replace the Instrument so that it meets the Specifications, at Applera Corporation’s expense. However, if the instrument becomes damaged or contaminated, or if the chemical performance of the Instrument otherwise deteriorates due to solvents and/or reagents other than those supplied or expressly recommended by Applera Corporation, Applera Corporation will return the Instrument to Specification at the customer's request and at the customer's expense. After this service is performed, coverage of the parts repaired or replaced will be restored thereafter for the remainder of the original Warranty Period.

This Warranty does not extend to any Instrument or part which has been (a) the subject of an accident, misuse, or neglect, (b) modified or repaired by a party other than Applera Corporation, or (c) used in a manner not in accordance with the instructions contained in the Instrument User Guide. This Warranty does not cover the customer-installable accessories or customer-installable consumable parts for the Instrument that are listed in the Instrument User Guide. Those items are covered by their own warranties.

Applera Corporation’s obligation under this Warranty is limited to repairs or replacements that Applera Corporation deems necessary to correct those failures of the Instrument to meet the Specifications of which Applera Corporation is notified prior to expiration of the Warranty Period. All repairs and replacements under this Warranty will be performed by Applera Corporation on site at the customer's location at Applera Corporation’s sole expense.

No agent, employee, or representative of Applera Corporation has any authority to bind Applera Corporation to any affirmation, representation, or warranty concerning the Instrument that is not contained in Applera Corporation's printed product literature or this Warranty Statement. Any such affirmation, representation or warranty made by any agent, employee, or representative of Applera Corporation will not be binding on Applera Corporation.

Applera Corporation shall not be liable for any incidental, special, or consequential loss, damage or expense directly or indirectly arising from the purchase or use of the Instrument. Applera Corporation makes no warranty whatsoever with regard to products or parts furnished by third parties.

This Warranty is limited to the original location and electrical power connection, unless the customer with written consent of Applera Corporation arranges for relocation of the instrument. This warranty is not transferable.

THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY AS TO THE INSTRUMENT AND IS IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY

OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND IS IN LIEU OF ANY OTHER OBLIGATION ON THE PART OF Applera Corporation.

Safety

Documentation User Attention Words

Five user attention words appear in the text of all Applied Biosystems user documentation. Each word implies a particular level of observation or action as described below.

Note Calls attention to useful information.

IMPORTANT Indicates information that is necessary for proper instrument operation.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

Chemical Hazard Warning

⚠ WARNING CHEMICAL HAZARD. Some of the chemicals used with Applied Biosystems instruments and protocols are potentially hazardous and can cause injury, illness, or death.

- Read and understand the material safety data sheets (MSDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (*e.g.,* safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the MSDS.
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (*e.g.*, fume hood). For additional safety guidelines, consult the MSDS.
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended on the MSDS.
- Comply with all local, state/provincial, or national laws and regulations related to chemical storage, handling, and disposal.

Chemical Waste Hazard Warning

⚠ WARNING CHEMICAL WASTE HAZARD. Wastes produced by Applied Biosystems instruments are potentially hazardous and can cause injury, illness, or death.

- Read and understand the material safety data sheets (MSDSs) provided by the manufacturers of the chemicals in the waste container before you store, handle, or dispose of chemical waste.
- Handle chemical wastes in a fume hood.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (*e.g.,* safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the MSDS.
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (*e.g.*, fume hood). For additional safety guidelines, consult the MSDS.
- After emptying the waste container, seal it with the cap provided.
- Dispose of the contents of the waste tray and waste bottle in accordance with good laboratory practices and local, state/provincial, or national environmental and health regulations.

Site Preparation and Safety Guide

A site preparation and safety guide is a separate document sent to all customers who have purchased an Applied Biosystems instrument. Refer to the guide written for your instrument for information on site preparation, instrument safety, chemical safety, and waste profiles.

About MSDSs

Some of the chemicals used with this instrument may be listed as hazardous by their manufacturer. When hazards exist, warnings are prominently displayed on the labels of all chemicals.

Chemical manufacturers supply a current MSDS before or with shipments of hazardous chemicals to new customers and with the first shipment of a hazardous chemical after an MSDS update. MSDSs provide you with the safety information you need to store, handle, transport and dispose of the chemicals safely.

We strongly recommend that you replace the appropriate MSDS in your files each time you receive a new MSDS packaged with a hazardous chemical.

⚠ WARNING CHEMICAL HAZARD. Be sure to familiarize yourself with the MSDSs before using reagents or solvents.

Ordering MSDSs

You can order free additional copies of MSDSs for chemicals manufactured or distributed by Applied Biosystems using the contact information below.

<table>
<tr><th>To order MSDSs...</th><th>Then...</th></tr>
<tr><td>Over the Internet</td><td>a. Go to our Web site at www.appliedbiosystems.com/techsupp
b. Click MSDSs
<table><tr><th>If you have...</th><th>Then...</th></tr><tr><td>The MSDS document number or the Document on Demand index number</td><td>Enter one of these numbers in the appropriate field on this page.</td></tr><tr><td>The product part number</td><td rowspan="2">Select Click Here, then enter the part number or keyword(s) in the field on this page.</td></tr><tr><td>Keyword(s)</td></tr></table>c. You can open and download a PDF (using Adobe® Acrobat® Reader™) of the document by selecting it, or you can choose to have the document sent to you by fax or email.</td></tr>
<tr><td>By automated telephone service</td><td>Use “To Obtain Documents on Demand” under “Technical Support.”</td></tr>
<tr><td>By telephone in the United States</td><td>Dial 1-800-327-3002, then press 1.</td></tr>
<tr><td>By telephone from Canada</td><td><table><tr><th>To order in...</th><th>Dial 1-800-668-6913 and...</th></tr><tr><td>English</td><td>Press 1, then 2, then 1 again</td></tr><tr><td>French</td><td>Press 2, then 2, then 1</td></tr></table></td></tr>
<tr><td>By telephone from any other country</td><td>See the specific region under “To Contact Technical Support by Telephone or Fax” under “Technical Support.”</td></tr>
</table>

For chemicals not manufactured or distributed by Applied Biosystems, call the chemical manufacturer.

Instrument Safety Labels

Safety labels are located on the instrument. Each safety label has three parts:

- A signal word panel, which implies a particular level of observation or action (*e.g.,* CAUTION or WARNING). If a safety label encompasses multiple hazards, the signal word corresponding to the greatest hazard is used.
- A message panel, which explains the hazard and any user action required.
- A safety alert symbol, which indicates a potential personal safety hazard. See the *ABI PRISM 6700 Automated Nucleic Acid Workstation Site Preparation and Safety Guide* for an explanation of all the safety alert symbols provided in several languages.

About Waste Profiles

A waste profile was provided with this instrument and is contained in the *ABI PRISM 6700 Automated Nucleic Acid Workstation Site Preparation and Safety Guide.* Waste profiles list the percentage compositions of the reagents within the waste stream at installation and the waste stream during a typical user application, although this application may not be used in your laboratory. These profiles assist users in planning for instrument waste handling and disposal. Read the waste profiles and all applicable MSDSs before handling or disposing of waste.

IMPORTANT Waste profiles are not a substitute for MSDS information.

About Waste Disposal

As the generator of potentially hazardous waste, it is your responsibility to perform the actions listed below.

- Characterize (by analysis if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- Ensure the health and safety of all personnel in your laboratory.
- Ensure that the instrument waste is stored, transferred, transported, and disposed of according to all local, state/provincial, or national regulations.

Note Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

Before Operating the Instrument

Ensure that everyone involved with the operation of the instrument has:

- Received instruction in general safety practices for laboratories
- Received instruction in specific safety practices for the instrument
- Read and understood all related MSDSs

⚠ CAUTION Avoid using this instrument in a manner not specified by Applied Biosystems. Although the instrument has been designed to protect the user, this protection can be impaired if the instrument is used improperly.

Safe and Efficient Computer Use

Operating the computer correctly prevents stress-producing effects such as fatigue, pain, and strain.

To minimize these effects on your back, legs, eyes, and upper extremities (neck, shoulder, arms, wrists, hands and fingers), design your workstation to promote neutral or relaxed working positions. This includes working in an environment where heating, air conditioning, ventilation, and lighting are set correctly. See the guidelines below.

⚠ CAUTION **MUSCULOSKELETAL AND REPETITIVE MOTION HAZARD**. These hazards are caused by the following potential risk factors which include, but are not limited to, repetitive motion, awkward posture, forceful exertion, holding static unhealthy positions, contact pressure, and other workstation environmental factors.

- Use a seating position that provides the optimum combination of comfort, accessibility to the keyboard, and freedom from fatigue-causing stresses and pressures.
  - The bulk of the person's weight should be supported by the buttocks, not the thighs.
  - Feet should be flat on the floor, and the weight of the legs should be supported by the floor, not the thighs.

  - Lumbar support should be provided to maintain the proper concave curve of the spine.
- Place the keyboard on a surface that provides:
  - The proper height to position the forearms horizontally and upper arms vertically.
  - Support for the forearms and hands to avoid muscle fatigue in the upper arms.
- Position the viewing screen to the height that allows normal body and head posture. This height depends upon the physical proportions of the user.
- Adjust vision factors to optimize comfort and efficiency by:
  - Adjusting screen variables, such as brightness, contrast, and color, to suit personal preferences and ambient lighting.
  - Positioning the screen to minimize reflections from ambient light sources.
  - Positioning the screen at a distance that takes into account user variables such as nearsightedness, farsightedness, astigmatism, and the effects of corrective lenses.
- When considering the user's distance from the screen, the following are useful guidelines:
  - The distance from the user's eyes to the viewing screen should be approximately the same as the distance from the user's eyes to the keyboard.
  - For most people, the reading distance that is the most comfortable is approximately 20 inches.
  - The workstation surface should have a minimum depth of 36 inches to accommodate distance adjustment.
  - Adjust the screen angle to minimize reflection and glare, and avoid highly reflective surfaces for the workstation.
- Use a well-designed copy holder, adjustable horizontally and vertically, that allows referenced hard-copy material to be placed at the same viewing distance as the screen and keyboard.
- Keep wires and cables out of the way of users and passersby.
- Choose a workstation that has a surface large enough for other tasks and that provides sufficient legroom for adequate movement.

System Description 2

Overview

About This Chapter

This chapter describes the features and functions of the ABI PRISM™ 6700 Automated Nucleic Acid Workstation components.

In This Chapter

This chapter contains the following topics:

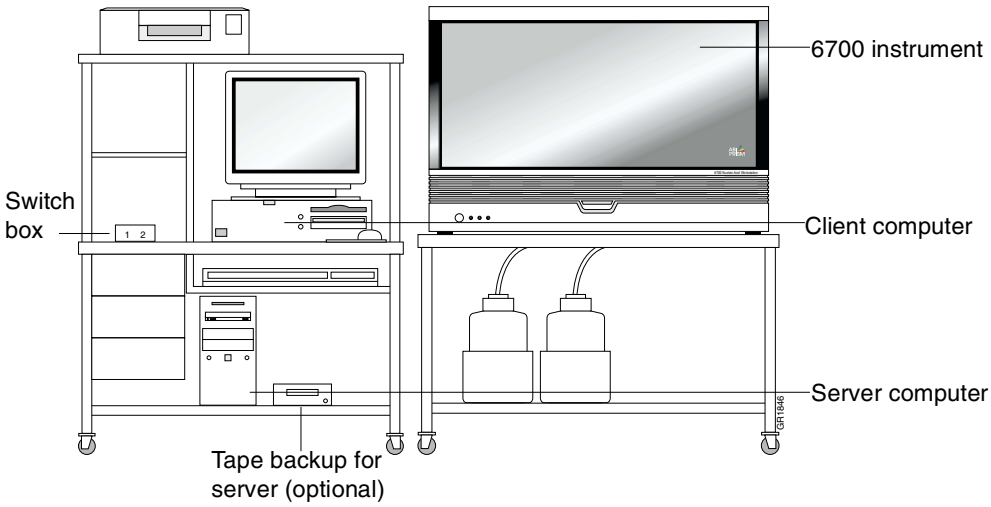
Topic	See Page
System Overview	2-2
6700 Instrument Components	2-3
Computer Hardware and Accessories	2-6
About the Software	2-7

System Overview

System Components

The 6700 Automated Nucleic Acid Workstation is an automated, high-throughput system that consists of the following components.

- 6700 instrument
- Client computer for the ABI PRISM™ 6700 Automated Nucleic Acid Workstation software
- Server computer for the 6700 database



System Functions

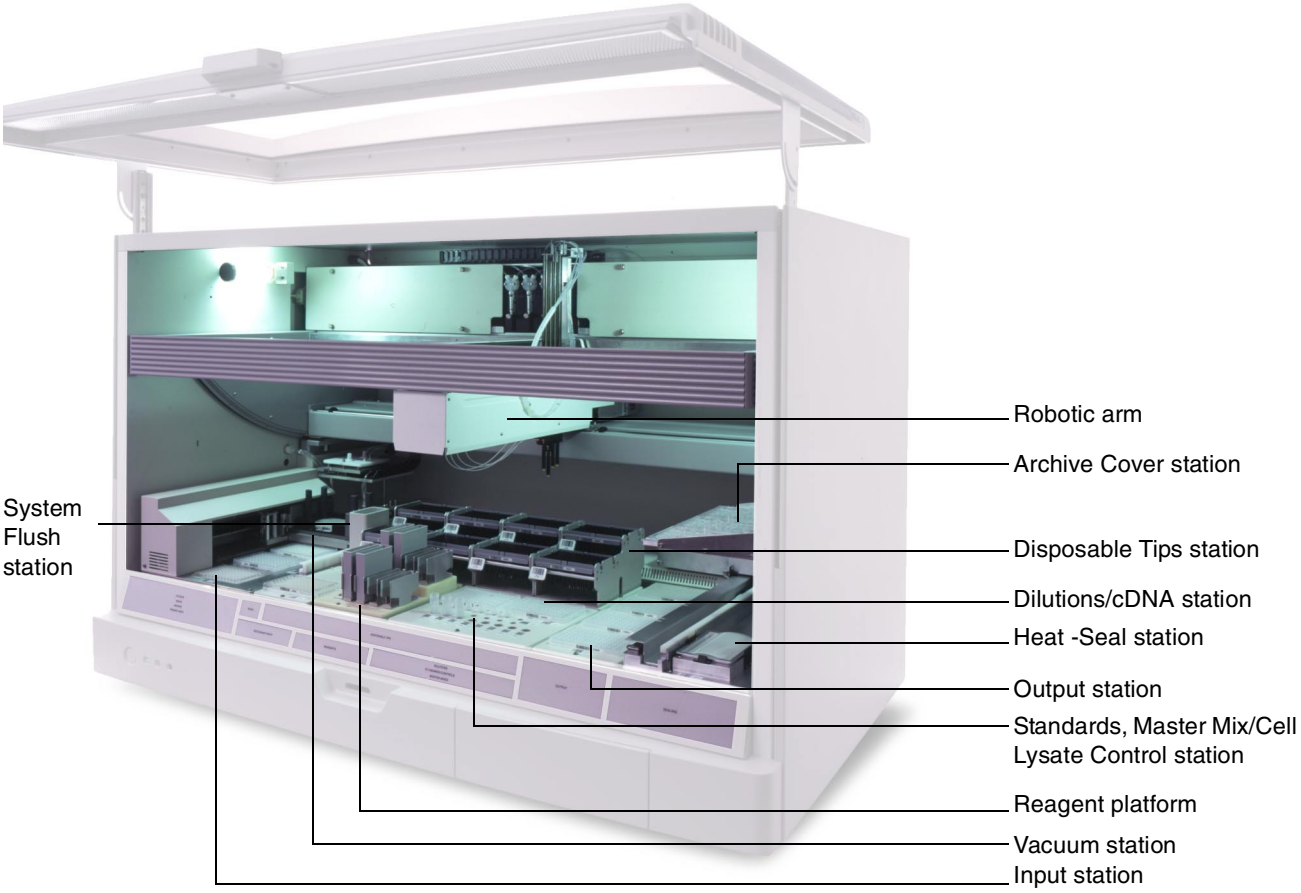
The 6700 workstation can perform the following nucleic acid preparation protocols:

Protocol	Function
Lysis	Lyse cells with Applied Biosystems reagents
DNA Precipitation	Precipitate DNA with Applied Biosystems reagents
RNA Archive	Purify RNA from lysed cells
DNA Archive	Purify DNA from precipitated DNA
cDNA Archive	Synthesize cDNA from RNA
Dilution Archive	Dilute nucleic acid samples
Assay	Prepare plates for nucleic acid assays

6700 Instrument Components

Instrument Diagram

The picture below shows the 6700 instrument and its components.



Robotic Arm Functions

The robotic arm moves to different deckspace locations to transfer samples, standards, controls, reagents, and archive covers as specified in the protocols.

The table below describes the robotic arm components and functions.

Component	Function
Robotic arm tip assemblies (4)	♦ Aspirate, deliver, and dispense reagents with disposable tips ♦ Pick up and transfer archive covers from the Archive Cover station to the archive plates
Diluters (4)	Control the volume and rate of liquid aspiration and dispensing

Deckspace Stations

The deckspace is a 1.17 x 0.43-m (46 x 17-in.) plate divided into stations for holding samples, reagents, plastic consumables, and waste for automated protocols.

The table below describes the deckspace stations.

Station	Description
Archive Cover station	Holds up to three archive covers
Disposable Tips station	Holds: ♦ Four rear-position racks for 1000-mL or 200-mL tips ♦ Four front-position racks for 200-mL tips
Dilutions/cDNA station	♦ Holds up to two archive plates ♦ Can be heated to 50 °C ♦ Can be cooled by Peltier units to 4 °C
Heat-Seal station	Holds up to four optical heat-seal covers
Output station	♦ Holds up to four output plates: – Four 96-well optical plates, OR – Three 96-well optical plates and one 384-well optical plate (for instruments with the 384-well upgrade) ♦ Cooled by Peltier units (The Peltier units can be set to cool from 4 °C to 15 °C. The default is 4 °C.)
Standards, Master Mix/Cell Lysate Control station	♦ Holds: – Up to twelve 2-mL microcentrifuge tubes for standards and controls – Up to eight 10-mL reagent tubes for master mixes or cell lysate controls ♦ Cooled by Peltier units to 4 °C
Reagent platform	Consists of the: ♦ Reagent reservoirs (holds up to eight) ♦ Tip eject plate and tip eject bin
Vacuum station	♦ Holds: – Splash guard in the waste position – Archive plate – Deep-well plate – Purification tray in the purification tray carriage ♦ Moves the purification carriage over the waste position, the filtrate position, or the archive position ♦ Applies vacuum pressure to the purification tray
Input station	♦ Holds 96-well cell culture plate (Falcon, Costar, or Nunc) in the Input 1 position ♦ Holds deep-well plate in the Input 2 position ♦ Input 1 position is cooled by Peltier units to 4 °C
System Flush station	Collects and recycles any system fluid dispensed when the diluters are primed or when the system fluid is flushed

Enclosure Functions

The 6700 instrument enclosure provides a controlled environment for performing protocols.

The table below describes the 6700 instrument enclosure components and functions.

<table>
<tr><th>Component</th><th>Description</th></tr>
<tr><td>Safety-interlocked door</td><td>Stops the instrument from operating when the door is opened by turning off power to the robotic arm</td></tr>
<tr><td>Blower</td><td>Provides user protection from aerosols</td></tr>
<tr><td>HEPA filter</td><td>Filters airborne particles and aerosols from the air leaving the instrument</td></tr>
<tr><td>Prefilters</td><td>Filter airborne particles and aerosols from the air entering the instrument</td></tr>
<tr><td>Interior lighting</td><td>Consists of two 32-watt, fluorescent bulbs</td></tr>
<tr><td>LED lights</td><td>Indicate instrument status as follows:
<table>
<tr><th>Color</th><th>Indication</th></tr>
<tr><td>Solid red</td><td>An instrument error occurred.</td></tr>
<tr><td>Flashing red (fast)</td><td>The instrument requires firmware download.</td></tr>
<tr><td>Flashing red (slow) accompanied with audible buzzer</td><td>There is an instrument malfunction. Call service.</td></tr>
<tr><td>Flashing yellow</td><td>Data transfer is occurring.</td></tr>
<tr><td>Green</td><td>The instrument door is closed, the system is ready, and the HEPA fans are on low speed.</td></tr>
<tr><td>Green off</td><td>The instrument door is open and the HEPA fans are fully on.</td></tr>
</table>
</td></tr>
</table>

Computer Hardware and Accessories

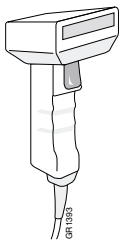
Computer Components

The computer hardware for the 6700 workstation consists of the following items:

Computer Component	Function
Server computer for the 6700 database (runs on the Windows NT® operating system)	♦ Stores the 6700 database, which contains protocols and run histories ♦ Stores the user account information for the 6700 database
Client computer for the 6700 software (runs on the Windows NT operating system)	♦ Used by the 6700 workstation database administrator, scientists, and operators to: – Access the 6700 database for protocols and run histories – Operate and maintain the 6700 instrument ♦ Used by the 6700 workstation database administrator to: – Manage the 6700 database user accounts – Troubleshoot the 6700 database – Maintain and back up the 6700 database
Monitor, keyboard, and mouse	Accesses the server and client computers
Switchbox	Switches the monitor, keyboard, and mouse between the server computer and the client computer
Barcode reader	Scans the barcodes of plastic consumables and deckspace stations during run setup
Keyboard wedge	Connects the barcode reader to the keyboard

Barcode Reader Description

The barcode reader is a handheld model manufactured by PSC, Inc. It is connected to the keyboard by a keyboard wedge.



IMPORTANT Shut down both the server computer and client computer before disconnecting the barcode reader. If you try to disconnect the barcode reader while either computer is running, the systems will fail.

⚠ WARNING LASER HAZARD. Exposure to direct or reflected laser light can burn the retina and leave permanent blind spots. Never look into the laser beam. Remove jewelry and anything else that can reflect the beam into your eyes. Protect others from exposure to the beam.

About the Software

Software Overview

The ABI PRISM™ 6700 Automated Nucleic Acid Workstation software provides:

- Control of instrument functions
- Access to the 6700 database for protocols, run logs, sample information, detectors, dyes, and archive plates created

Software Tabs

There are three main tabs in the 6700 software for interacting with the instrument:

- Protocol tab
- Deckspace tab
- Instrument tab

Tab Commands

Each tab is designed for performing tasks related to specific stages of a 6700 workstation run.

Tab	Run Stage	Possible Actions
Protocol	Run setup	♦ View stored protocols ♦ Create new protocols ♦ Select protocols for a run ♦ Enter archive sample names ♦ Import archive sample names from a previous run ♦ Import archive sample names from a file ♦ Export archive sample names to a file ♦ Select the input plate ♦ Define the input plate ♦ Select specific samples to start protocols ♦ Select specific samples for the Assay protocol ♦ Verify protocol setup
Deckspace	Deckspace preparation	♦ View the deckspace ♦ View the consumables and reagents required for the run ♦ Load the deckspace with consumables and reagents ♦ Enter barcodes
Instrument	Instrument run	♦ Cool Peltiers or stop Peltiers from cooling ♦ Start, stop, or pause a run ♦ Monitor the status of the instrument ♦ Monitor the run log in real time ♦ View and print protocol details and sample lists

Menu Bar Items

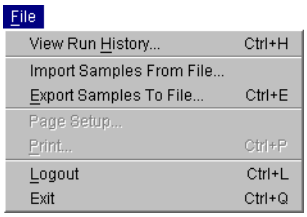
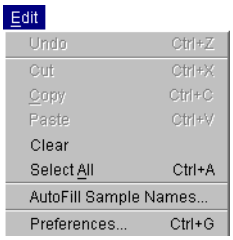
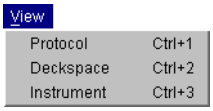
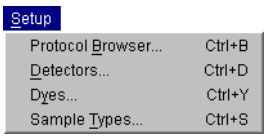
The menu bar contains seven main menu items:

- File
- Edit
- View
- Setup
- Protocol
- Instrument
- Help

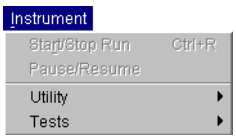
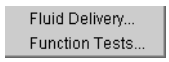
Menu Commands

The table below describes the commands under each menu bar item

Description of the Menu Commands

Menu Items	Command	Function
	View Run History…	View stored runs.
	Import Samples From File…	Import archive sample names from a tab-delimited text file.
	Export Samples To File...	Export archive sample names to a tab-delimited text file.
	Page Setup...	These are standard commands. Refer to a Windows NT platform manual for more information.
	Print...	
	Logout	Log out of the 6700 software.
	Exit	Log out and exit the 6700 software.
	Undo	These are standard commands. Refer to a Windows NT platform manual for more information.
	Cut	
	Copy	
	Paste	
	Clear	Clear all samples selected in the archive sample name list.
	Select All	Select all samples in the archive sample name list.
	AutoFill Sample Names...	Fill archive sample names according to a preset formula.
	Preferences...	Set preferences for viewing protocols.
	Protocol	View the Protocol tab.
	Deckspace	View the Deckspace tab.
	Instrument	View the Instrument tab.
	Protocol Browser…	View protocols in the 6700 database.
	Detectors…	View detectors used in master mixes for the Assay protocol.
	Dyes…	View dyes used in detectors.
	Sample Types…	View sample types used in the Assay protocol.

Description of the Menu Commands *(continued)*

Menu Items	Command	Function
	Start/Stop Run	Start or stop a run from the Instrument tab.
	Pause/Resume	Pause or resume a run from the Instrument tab.
	Utility	
	♦ Initialize…	Initialize the robotic arm, diluters, automatic Heat-Seal station, automatic Vacuum station, and safety-interlocked door.
	♦ Seal Plates…	Command the heat sealer to seal the output plates independent of a protocol run.
	♦ System Flush…	Purge the system fluid lines and/or prime and purge the diluters.
	♦ Calibration…	Calibrate the robotic arm to the deckspace. **Note** This function requires an Administrator login.
	♦ Download Firmware…	Download the firmware for the instrument and the robotic arm. **Note** This function requires an Administrator login.
	♦ Edit Calibration Values...	These commands are for service use only.
	♦ Set Instrument Serial Number...	
	♦ Set Pressure Sensor...	
	♦ Single Command...	
	♦ Touchoff Adjust...	
	Tests	
	♦ Fluid Delivery…	Test accuracy and precision of fluid delivery.
	♦ Function Tests…	Troubleshoot instrument performance.

Instrument Operation 3

Overview

About This Chapter

This chapter contains procedures for operating the ABI PRISM™ 6700 Automated Nucleic Acid Workstation.

In This Chapter

This chapter contains the following topics:

Topic	See Page
Instrument Run Overview	3-2
Software Login	3-5
Protocol Setup	3-10
Deckspace Setup	3-20
Instrument Run	3-30
After the Instrument Run	3-34

Instrument Run Overview

Run Description

A run refers to a user-defined combination of various protocol types (as described on page 3-3). Once the parameters are set by the user, the run is automated by the 6700 workstation.

Order of Operations

The table below shows the order of operations required for a 6700 workstation run.

6700 Workstation Run: Order of Operations

Stage	Description
1	The user logs in to the ABI PRISM™ 6700 Automated Nucleic Acid Workstation software from the client computer.
2	If needed, the user creates new protocol(s).
3	The user completes tasks on the **Protocol** tab: a. Selects the protocol(s) b. Names the archive samples c. Selects the input plate type d. Selects samples for the Assay protocol (optional)
4	The user completes tasks on the **Deckspace** tab: a. Scans deckspace barcodes with the barcode reader b. Scans consumable barcodes c. Places required consumables and reagents on the deckspace
5	The user completes tasks on the **Instrument** tab: a. Cools the deckspace Peltier units b. Starts the run
6	The 6700 instrument performs the specified protocol(s).
7	After the 6700 instrument completes the run, the user retrieves the archive(s) and/or output plate(s), stores the plates until needed, and clears the deckspace.

About Input Plates

The 6700 instrument requires an input plate to start a run. The table below describes the contents of each input plate type.

Description of the Input Plate Types

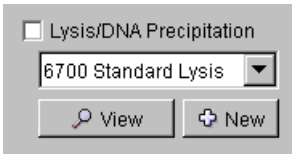
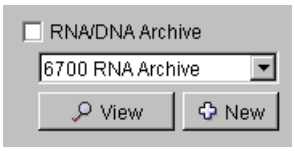
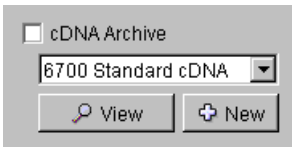
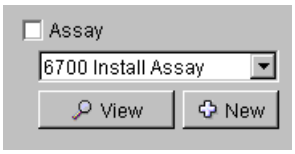
Input Plate Type	Description
Raw	Cells suspended in buffer
Lysed	Lysed cells
Deep-well	♦ Filtrate collected by the 6700 instrument during an RNA Archive protocol or DNA Archive protocol or ♦ Precipitated DNA
RNA archive	♦ Purified RNA or ♦ Dilution archive of an RNA Archive protocol

Description of the Input Plate Types *(continued)*

Input Plate Type	Description
DNA archive	♦ Purified DNA or ♦ Dilution archive of a DNA Archive protocol
cDNA archive	♦ Synthesized cDNA or ♦ Dilution archive of a cDNA Archive protocol

About the Protocols

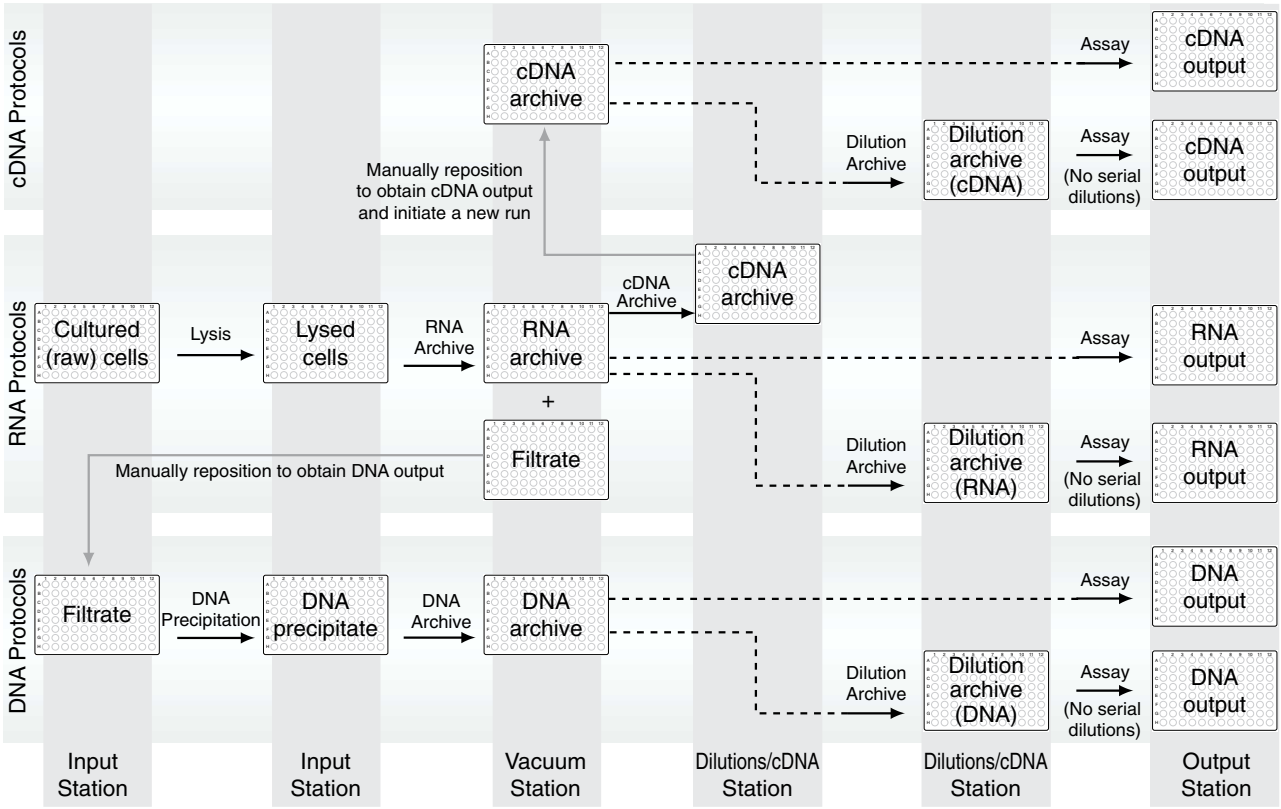
The 6700 workstation can perform five basic protocols, which can be customized depending on your application. The five basic protocols are described briefly below. See Chapter 4, "Protocol Creation," for more detailed descriptions of the 6700 workstation protocols.

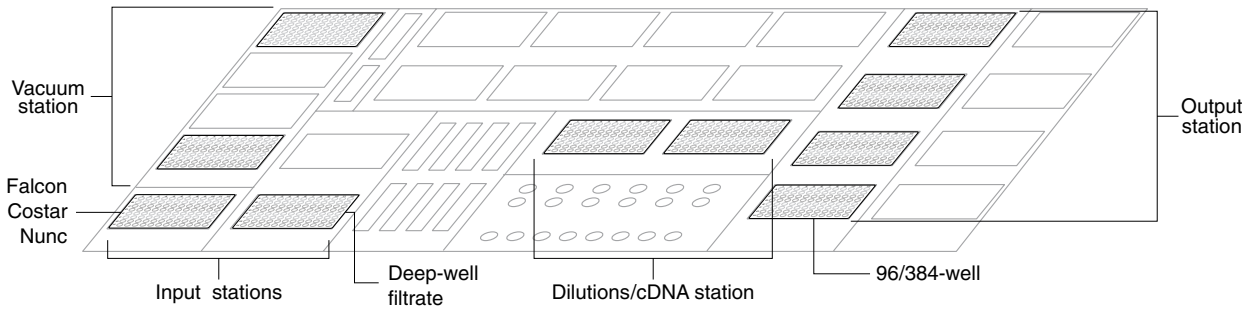
6700 Protocol	Purpose	See Page
Lysis/DNA Precipitation 	♦ To lyse cells with Applied Biosystems reagents ♦ To precipitate DNA with Applied Biosystems reagents	4-11, 4-15
RNA/DNA Archive 	♦ To purify RNA from lysed cells ♦ To purify DNA from precipitated DNA	4-19, 4-31
cDNA Archive 	To synthesize cDNA from RNA	4-43
Dilution Archive 	To dilute RNA, DNA, or cDNA	4-47
Assay 	To prepare output plates for assays	4-53

Protocol Flow

The figure below shows the protocols possible on the 6700 workstation, the flow of these protocols, the input and output plates, and the location of the input and output plates on the deckspace.

IMPORTANT Assay protocols that specify sample dilutions other than “Neat” cannot follow a Dilution Archive protocol.





Configurations for the Output Station

The Output station can be configured as follows:

Platform	Configuration
96-well	♦ Four 96-well optical plates
384-well	♦ Three 96-well optical plates ♦ One 384-well optical plate **Note** 96-well and 384-well optical plates cannot be run simultaneously.

Software Login

Establishing an Account

The ABI PRISM™ 6700 Automated Nucleic Acid Workstation software supports an electronic signature system to log system use and to log the creation, modification, and deletion of protocols.

Before you can use the 6700 workstation, you must establish a database account with the 6700 workstation database administrator. The database administrator will provide you with a user name and password and will assign a user level.

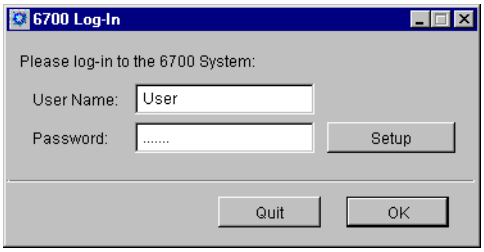
User Levels

The table below lists the assigned privileges for each user level.

User Level	Privileges
Operator	♦ Log in to the 6700 workstation ♦ View protocols, detectors, dyes, and sample types ♦ View run history, import samples from file, and export samples to file ♦ Set up and begin 6700 workstation runs ♦ Perform instrument utility functions: – Initialize the instrument – Seal plates – Flush the system ♦ Perform instrument tests: – Function tests
Scientist	The operator privileges listed above, plus: ♦ Create protocols, detectors, dyes, and sample types ♦ Duplicate or delete protocols created by the user (identified by the user name and password combination) ♦ Edit or delete detectors, dyes, and sample types created by the user (identified by the user name and password combination)
Administrator	The scientist privileges listed above, plus: ♦ Add, delete, or edit user accounts ♦ Perform database administration utilities ♦ Calibrate the instrument ♦ Download firmware

Logging In

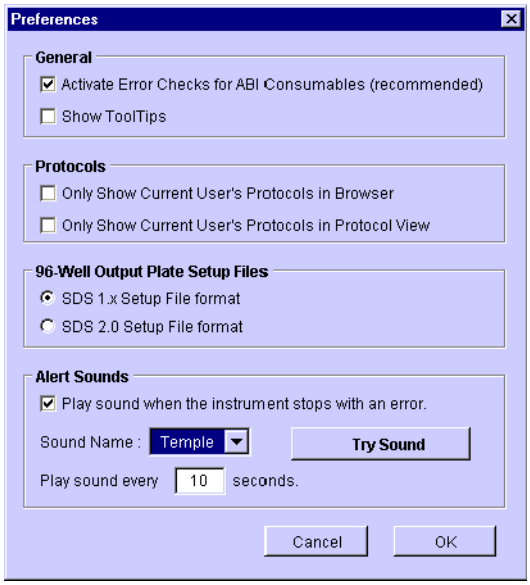
To log in to the 6700 workstation:

Step	Action
1	Launch the 6700 software: a. Go to the client computer's **Start** menu. b. Scroll to **Programs**. c. Select **ABI 6700 Instrument Application**. A **6700 Log-In** dialog box appears.
2	Enter the correct **User Name** and **Password** combination. **IMPORTANT** Entries are case-sensitive. 
3	Click **OK**.

If login was...	Then...
successful	the **Protocol** tab of the 6700 software appears.
unsuccessful the first time	a **Login Error** dialog box appears. Click **OK** and repeat step 2.
unsuccessful the second time	a **Login Error** dialog box appears. a. Click **OK**. b. Make sure the server computer is on and the Windows NT® platform is running. c. Repeat step 1 and step 2. d. If login is still unsuccessful, contact your on-site 6700 workstation database administrator to confirm your account information.

Setting Preferences

To set preferences:

Step	Action
1	From the **Edit** menu, select **Preferences…** A **Preferences** dialog box opens. 
2	Set the following **General** preferences: ♦ **Activate Error Checks for ABI Consumables (recommended)** – Check this box if you want the 6700 workstation to display error messages if the consumables are incorrect or if the consumables are in the wrong place. **IMPORTANT** It is strongly recommended that you check this box. If the box is not selected, it may cause the run to abort. ♦ **Show ToolTips** – Check the box if you want hints to appear as you move the cursor to different areas of each tab. – Uncheck the box if you do not want hints to appear.
3	Set the following **Protocols** preferences: ♦ **Only Show Current User's Protocols in Browser** – Check the box if you want to see only protocols that you created in the **Protocol Browser**. – Uncheck the box if you want to see all protocols in the database in the **Protocol Browser**. ♦ **Only Show Current User's Protocols in Protocol View** – Check the box if you want to see only protocols that you created in the protocol pop-up menus on the **Protocol** tab. – Uncheck the box if you want to see all protocols in the database in the protocol pop-up menus on the **Protocol** tab.

To set preferences: *(continued)*

Step	Action
4	Set the following **96-Well Output Plate Setup Files** preferences: ♦ **SDS 1.x Setup File format** – Check this box if you are analyzing output plates only on the ABI PRISM® 7700 Sequence Detection System (7700 SDS). The list of consumables for the 7700 SDS is small and is incompatible with the ABI PRISM® 7900HT Sequence Detection System (7900HT SDS). – Uncheck this box if you will be analyzing output plates with both the 7700 SDS and 7900HT SDS. ♦ **SDS 2.0 Setup File format** – Check this box if you are analyzing output plates only on the 7900HT SDS. – Uncheck this box if you will be analyzing output plates with both the 7700 SDS and 7900HT SDS.
5	Set the following **Alert Sounds** preferences: ♦ **Play sound when the instrument stops with an error.** – Check this box if you want to hear a sound when the instrument stops with an error. Choose a **Sound Name** and frequency as desired. – Uncheck this box if you do not want to hear any sound.

Adding Users

Only the database administrator and service engineers can add users.

To add users:

Step	Action
1	Go to the computer's **Start** menu, scroll to **Programs**, and select **ABI User Account Manager**. A **Connect to User Account Database** dialog box appears.
2	Log into the user account database with a database administrator or service engineer account.
3	Click **Connect**. A **User Account Manager** window appears.
4	Click **New**. An **Add User** dialog box appears.
5	Enter the **Login Name**, **Password**, **Confirm Password**, and **Full Name**. **Note** Spaces are not allowed in the login name or the password. The login name and password must begin with a letter of the alphabet.
6	Select the type of user account to set up.
7	Click **Add**. The new user information appears in the **User Account Manager** window.

Deleting Users

Only the database administrator and service engineers can delete users.

To delete users:

Step	Action
1	Go to the computer's **Start** menu, scroll to **Programs**, and select **ABI User Account Manager**. A **Connect to User Account Database** dialog box appears.
2	Log into the user account database with a database administrator or service engineer account.
3	Click **Connect**. A **User Account Manager** window appears.
4	Select the user account to be deleted. **IMPORTANT** Do not delete the **pebio** account.
5	Click **Delete**. A dialog box appears, requesting whether or not you wish to delete the selected account.
6	Click **OK** to delete the user account.

Protocol Setup

Protocol Setup Overview

Protocol setup occurs via the Protocol tab of the 6700 software. The process involves the following stages:

Stage	See Page
Selecting Protocols	3-11
Viewing Protocols	3-11
Creating Protocols	3-11
Entering Archive Sample Names	3-12
Selecting an Input Plate Type	3-17
Selecting Samples for the Assay Protocol	3-18

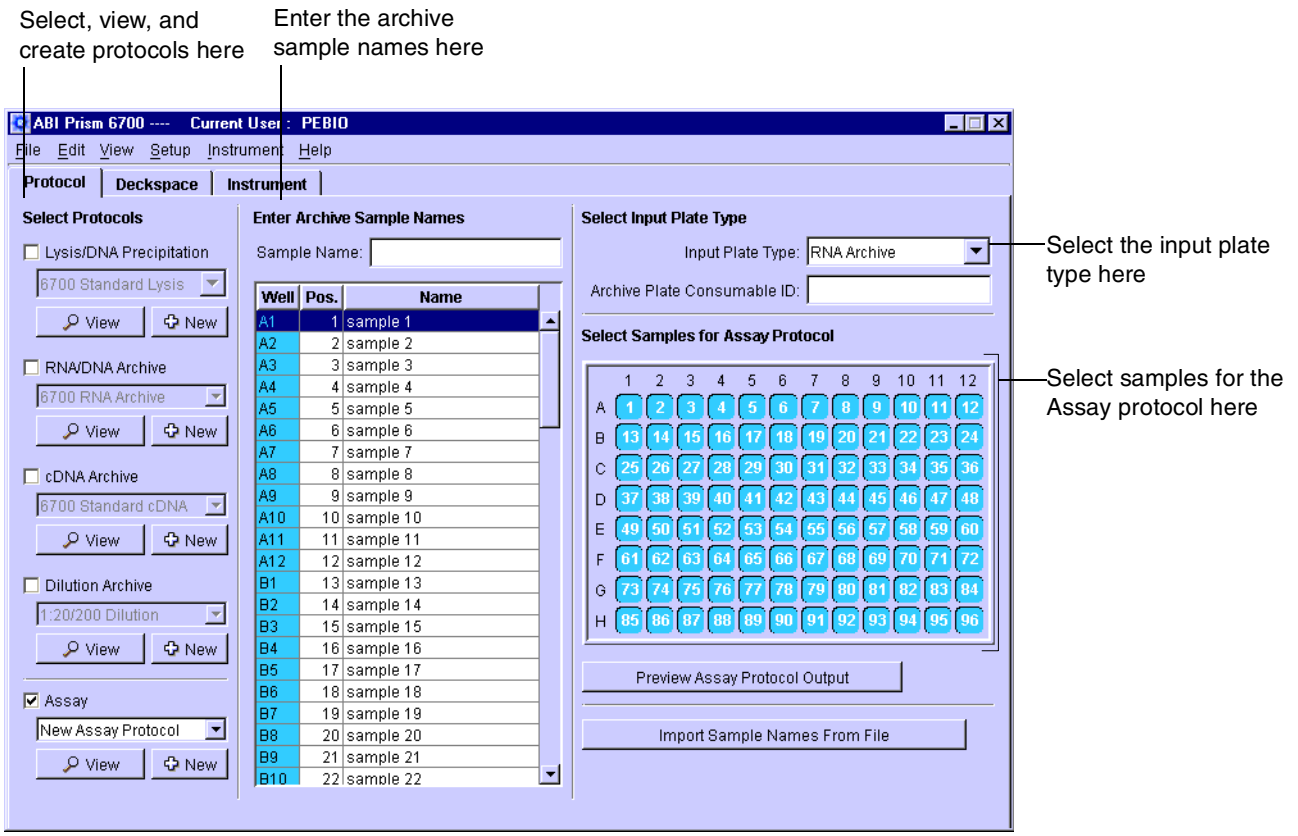
Protocol Tab View

Accessing the Protocol Tab

To access the Protocol tab:

Step	Action
1	Launch the 6700 software. The **Protocol** tab is automatically displayed, as shown below.

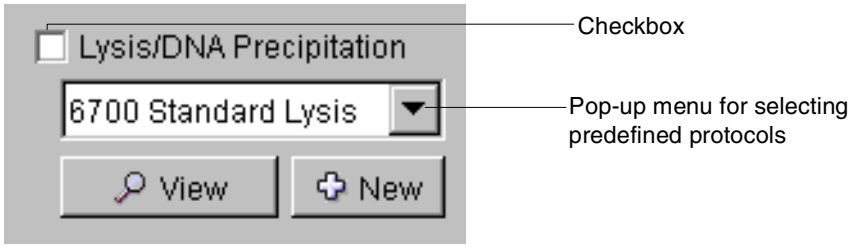
The figure below shows the different areas of the Protocol tab.



Selecting Protocols

You can select up to four protocols for one run. The number of protocols required varies according to the input plate and the goal of the run.

To select protocols:

Step	Action
1	In the **Select Protocols** section of the **Protocol** tab, check the box next to the protocols required for the run. 
2	For each protocol you checked in step 1, select a predefined protocol from the pop-up menu. **Note** By default, the pop-up menu contains all protocols in the database that are in use. To view protocols created only by the current user, you need to change your preferences (see “Setting Preferences” on page 3-7). **Note** Assay protocols with 384-well output and 96-well output cannot be run simultaneously.

Viewing Protocols

You can view protocols to confirm conditions.

To view protocols:

Step	Action
1	In the **Select Protocols** section of the **Protocol** tab, click the **View** button underneath the protocol you wish to view. The protocol conditions appear. **Note** The windows displayed when viewing protocol conditions are identical to those displayed when creating new protocols (*i.e.,* changing protocol conditions). However, you cannot make any changes to the protocols using this procedure. If you want to make changes, see Chapter 4, “Protocol Creation.”
2	Click **OK** or **Close** to close the window and return to the **Protocol** tab.

Creating Protocols

Note Protocol creation requires the Scientist or Administrator login.

To create protocols:

Step	Action
1	In the **Select Protocols** section of the **Protocol** tab, click the **New** button underneath the protocol you wish to create.
2	For details on creating and defining protocols, see Chapter 4, “Protocol Creation.”

Entering Archive Sample Names

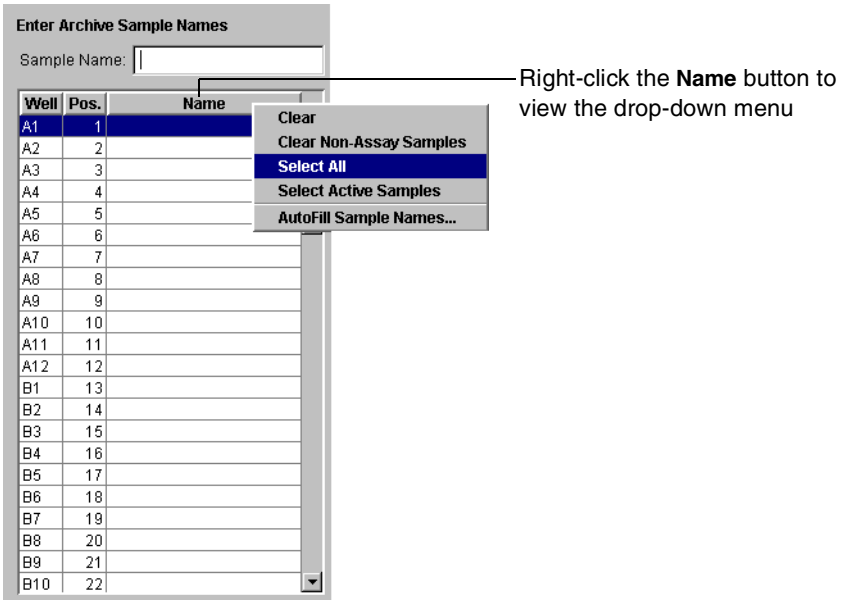
Guidelines

Follow the guidelines below when entering archive sample names.

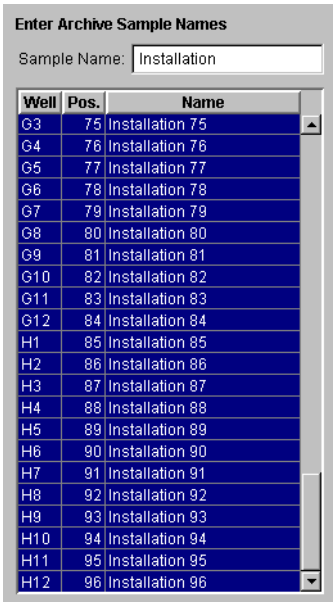
- Enter names in one of three ways:
  - Use the Sample Name field (see below).
  - Use the AutoFill Sample Names menu command (see page 3-14).
  - Import archive sample names from a previous run (see page 3-16).
- Use names that are unique for the run.
- Create names that contain ≤94 characters.
- Enter names for all samples to be prepared from the input plate.

Using the Sample Name Field

To name the samples using the Sample Name field:

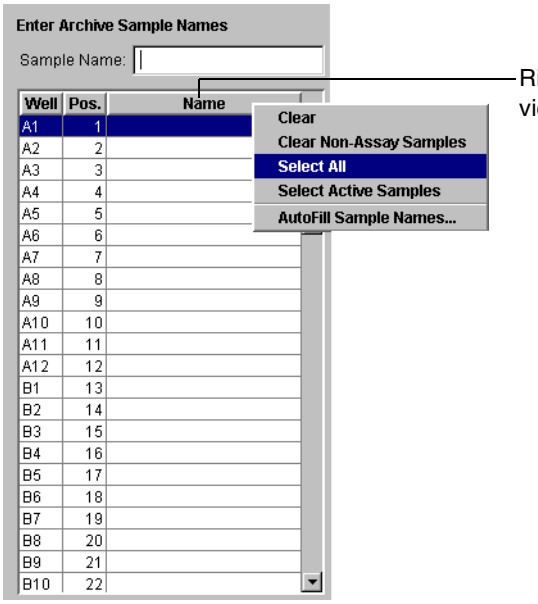
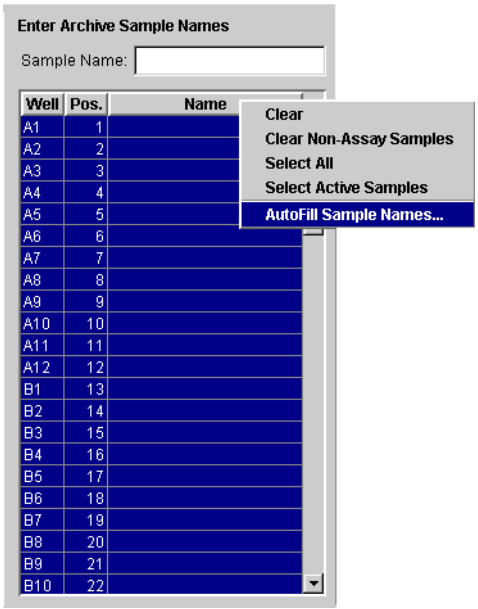
Step	Action
1	In the **Enter Archive Sample Names** section of the **Protocol** tab, highlight the rows corresponding to the sample wells. **Note** To select all 96 samples, right-click the **Name** button and choose **Select All** from the drop-down menu. 

To name the samples using the Sample Name field: *(continued)*

Step	Action
2	Place the cursor in the **Sample Name** field and enter a name. The software assigns the **Sample Name** to the sample.  **Note** If you selected more than one row in step 1, the software assigns the **Sample Name** to each sample with a number.
3	Repeat steps 1 and 2 until you name all the samples.

Using the AutoFill Menu Command

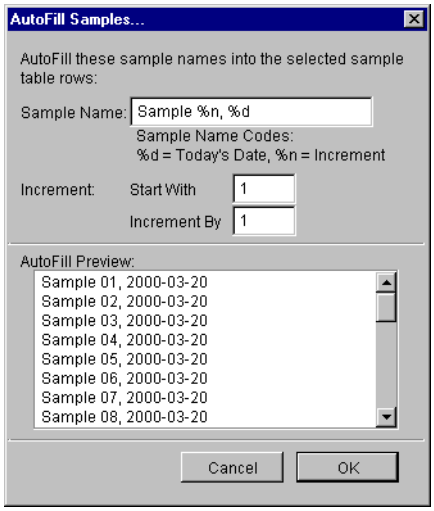
To name the samples using the AutoFill menu command:

Step	Action
1	In the **Enter Archive Sample Names** section of the **Protocol** tab, highlight the rows corresponding to the sample wells. **Note** To select all 96 samples, right-click the **Name** button and choose **Select All** from the drop-down menu. 
2	Right-click the **Name** button and select **AutoFill Sample Names** from the drop-down menu.  The **AutoFill Samples...** dialog box appears.

To name the samples using the AutoFill menu command: *(continued)*

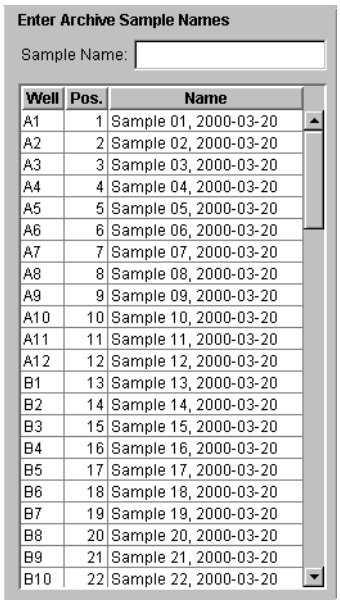
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Place the cursor in the Sample Name field and enter a name, using the Sample Name Codes shown below.

<table>
<tr><th>Sample Name Code</th><th>Meaning</th></tr>
<tr><td>%n</td><td>Increment</td></tr>
<tr><td>%d</td><td>Today's Date (year-month-day)</td></tr>
</table>

Note The default Sample Name is Sample %n, %d.</td></tr>
<tr><td>4</td><td>If you choose to name the samples with incremental numbers (the %n Sample Name Code) select the Increment parameters:
a. Enter the number for the first sample in the Start With field.
b. Enter the increment value in the Increment By field.</td></tr>
<tr><td>5</td><td>Preview the sample names in the AutoFill Preview pane.</td></tr>
</table>

To name the samples using the AutoFill menu command: *(continued)*

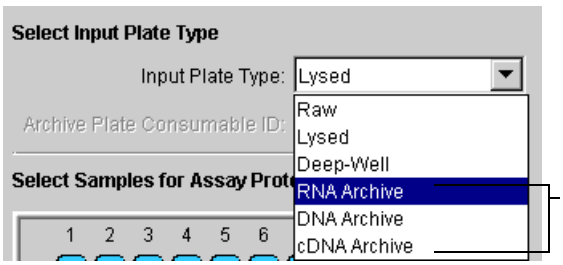
Step	Action
6	Click **OK**. The software names the samples using the formula in the **Sample Name** field. 

Well	Pos.	Name
A1	1	Sample 01, 2000-03-20
A2	2	Sample 02, 2000-03-20
A3	3	Sample 03, 2000-03-20
A4	4	Sample 04, 2000-03-20
A5	5	Sample 05, 2000-03-20
A6	6	Sample 06, 2000-03-20
A7	7	Sample 07, 2000-03-20
A8	8	Sample 08, 2000-03-20
A9	9	Sample 09, 2000-03-20
A10	10	Sample 10, 2000-03-20
A11	11	Sample 11, 2000-03-20
A12	12	Sample 12, 2000-03-20
B1	13	Sample 13, 2000-03-20
B2	14	Sample 14, 2000-03-20
B3	15	Sample 15, 2000-03-20
B4	16	Sample 16, 2000-03-20
B5	17	Sample 17, 2000-03-20
B6	18	Sample 18, 2000-03-20
B7	19	Sample 19, 2000-03-20
B8	20	Sample 20, 2000-03-20
B9	21	Sample 21, 2000-03-20
B10	22	Sample 22, 2000-03-20

Importing Archive Sample Names

If your input plate type is an archive plate from a previous run, you can import the archive sample names from the 6700 database.

To import archive sample names from the 6700 database:

Step	Action
1	In the **Select Input Plate Type** section of the **Protocol** tab, select one of the following plates from the **Input Plate Type** pop-up menu: ♦ **RNA Archive** ♦ **cDNA Archive** ♦ **DNA Archive** **Note** If your input plate type is a dilution archive plate, select either **RNA Archive**, **cDNA Archive**, or **DNA Archive**.  The **Archive Plate Consumable ID** field becomes active.

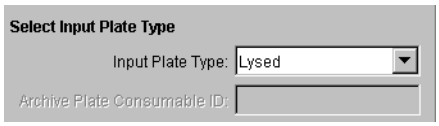
To import archive sample names from the 6700 database: *(continued)*

Step	Action
2	Using the barcode reader, scan the **Archive Plate Consumable ID** barcode on the archive plate. **⚠ WARNING LASER HAZARD.** Exposure to direct or reflected laser light can burn the retina and leave permanent blind spots. Never look into the laser beam. Remove jewelry and anything else that can reflect the beam into your eyes. Protect others from exposure to the beam. a. The software enters the barcode, then searches the 6700 database for the barcode and the corresponding archive sample names.  b. The software imports the **Sample Names** and enters the **Consumable ID** on the Deckspace tab. **Note** You cannot edit archive sample names imported from the database.

Selecting an Input Plate Type

Note These are general procedures for selecting an input plate type. If you are importing archive sample names, select an input plate type per step 1 of "Importing Archive Sample Names" on page 3-16.

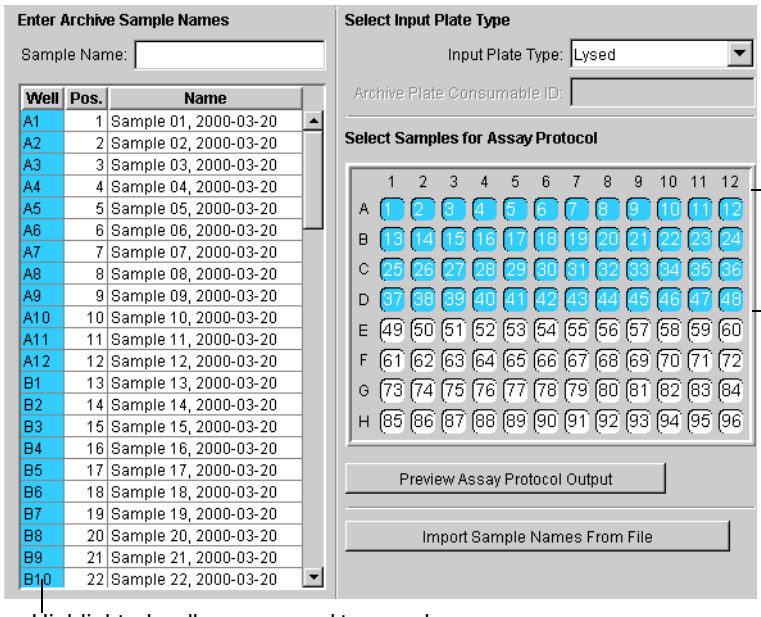
To select an input plate type:

Step	Action
1	In the **Select Input Plate Type** section of the **Protocol** tab, select a plate from the **Input Plate Type** pop-up menu. **Note** See "About Input Plates" on page 3-2 for descriptions of input plate types.  **If the first protocol in the run is… / Then select…** Lysis → **Raw** DNA Precipitation → **Deep-Well Filtrate Plate** RNA Archive → **Lysed** DNA Archive (using a deep-well plate) → **Deep-Well Filtrate Plate** cDNA Archive → **RNA Archive** Dilution Archive → **RNA Archive**, **DNA Archive**, or **cDNA Archive** Assay → **RNA Archive**, **DNA Archive**, or **cDNA Archive**

Selecting Samples for the Assay Protocol

If you selected an Assay protocol, select the samples to transfer to output plates.

To select samples for the Assay protocol:

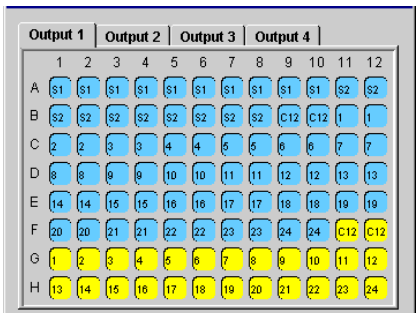
Step	Action
1	In the **Select Samples for Assay Protocol** section of the **Protocol** tab, click the appropriate wells. **Note** To select multiple wells, click and drag, or hold down the Ctrl key. The corresponding **Wells** in the **Enter Archive Sample Names** section of the **Protocol** tab are highlighted. 

To select samples for the Assay protocol: *(continued)*

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>2</td><td>Click the Preview Assay Protocol Output button to preview the arrangement of samples in the output plates.

A Preview Assay Protocol Output dialog box appears.

Note The dialog box indicates how many samples can be placed on the output plates, but the number of samples the system can handle may be less due to other limits, e.g., the number of tips the deckspace can hold.

<table>
<tr><th>If you are using a...</th><th>Then the dialog box shows...</th></tr>
<tr><td>96-well instrument</td><td>Output tabs 1, 2, 3, and 4.
 
</td></tr>
<tr><td>384-well upgrade and running a 384-well optical plate</td><td>Output tab 1 only.</td></tr>
<tr><td>384-well upgrade and running 96-well optical plate(s)</td><td>Output tabs 2, 3, and 4.</td></tr>
</table></td></tr>
<tr><td>3</td><td>Click the Output tab(s) to view the arrangement of samples in each output plate.

Note The well color indicates which master mix is present (see “Specifying the Master Mixes” on page 4-71 for more information).</td></tr>
<tr><td>4</td><td>Click Done.</td></tr>
</table>

Deckspace Setup

Deckspace Setup Overview

Deckspace setup occurs through the Deckspace tab of the 6700 software. The process involves the following stages:

Stage	See Page
Cooling the Deckspace	3-21
Selecting Plate Cover Options	3-22
Viewing Deckspace Information	3-22
Using the Barcode Reader and Deckspace Tab	3-23
Placing Required Consumables, Reagents, or Placeholders	3-26
Verifying the Deckspace	3-29

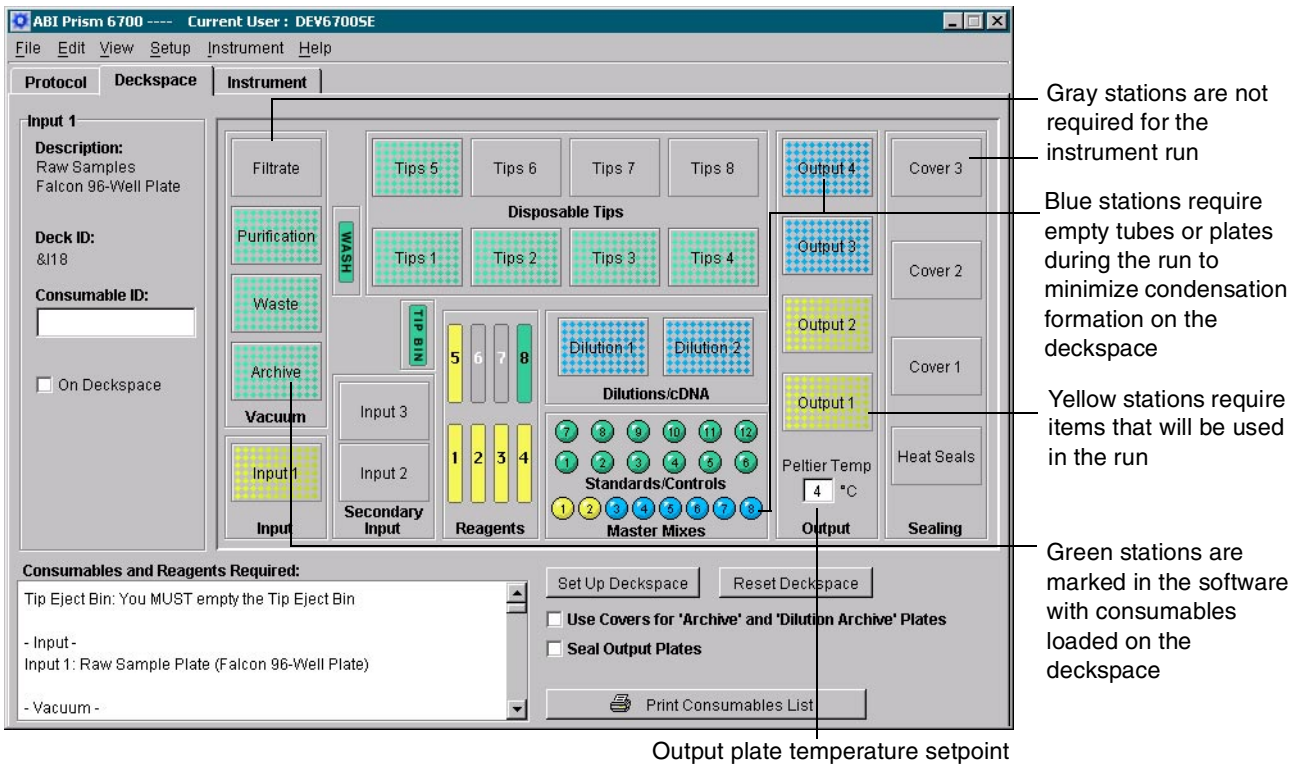
Deckspace Tab View

Accessing the Deckspace Tab

To access the Deckspace tab:

Step	Action
1	Launch the 6700 software. The **Protocol** tab is automatically displayed.
2	Click the **Deckspace** tab. The **Deckspace** tab is displayed, as shown below.

The figure below shows the different areas of the Deckspace tab.



Deckspace Colors

Deckspace tab station colors indicate the requirements of the deckspace position.

If the station color is…	Then the position…
Yellow	requires a consumable (*e.g.*, plate or tip rack) or reagent to perform the run.
Blue	requires a placeholder (*e.g.*, an empty tube or 96-well optical plate). **IMPORTANT** Placeholders are required to minimize condensation formation on the deckspace.
Green	is marked in the software as loaded with the appropriate consumable or reagent.
Gray	will not be used in the run.

Cooling the Deckspace

IMPORTANT Begin cooling the deckspace Peltier units before setting up the deckspace to prevent degradation of the input, standards, controls, reagents, and master mixes.

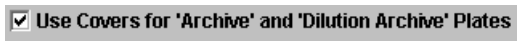
To cool the deckspace:

Step	Action
1	Go to the **Deckspace** tab.
2	In the **Peltier Temp** field, select the temperature setpoint for the output plates. The range is 4 °C to 15 °C. The default is 4 °C. 
3	Go to the **Instrument** tab.
4	Click the **Cool Peltiers** button.  The 6700 instrument begins to cool the following stations: ♦ Input station ♦ Standards, Master Mix/Cell Lysate Control station ♦ Dilutions/cDNA station ♦ Output station **Note** It takes up to 20 minutes to cool the stations.

Selecting Plate Cover Options

Select plate cover options for all archive plates and for all assay output plates. The 6700 workstation covers and seals plates after completing the protocols.

To select plate cover options:

Step	Action
1	Go to the **Deckspace** tab.
2	For the 6700 instrument to place archive covers on all of the archive plates and dilution archive plates after performing the run, check **Use Covers for 'Archive' and 'Dilution Archive' Plates**.  An appropriate number of **Cover** locations turns yellow. **Note** The instrument always places archive covers on cDNA archive plates.
3	For the 6700 instrument to seal all of the assay output plates with optical heat-seal covers immediately after performing the Assay protocol, check **Seal Output Plates**.  The **Heat Seals** location turns yellow. **IMPORTANT** Make sure to put enough optical heat-seal covers in the Heat-Seal station for your run, however, never add more than six. If you add more than six optical heat-seal covers, the instrument may fail to pick them up and seal the output plates.

Viewing Deckspace Information

To view deckspace information:

Step	Action
1	View the **Consumables and Reagents Required** for the run in the bottom-left panel. **Note** See Appendix B, "6700 Workstation Materials," for descriptions and part numbers of consumables and reagents.
2	To print the list, click the **Print Consumables List** button.
3	Gather the consumables and reagents required for the run before setting up the deckspace.

Loading the Deckspace

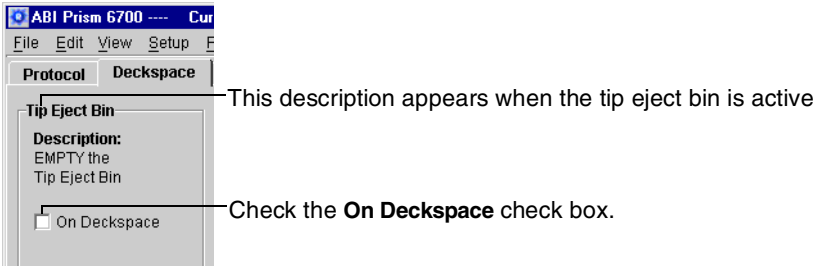
Guidelines

Follow the guidelines below when loading the deckspace.

- Load the deckspace in one of two ways:
  - Use the barcode reader and the Deckspace tab (see below).
  - Use the Setup Deckspace window (see page 3-25).
- Enter unique barcodes or consumable IDs for archive plates and output plates.
- Load placeholder items to minimize condensation on Peltier-cooled deckspace stations.
- To reset the deckspace, click the Reset Deckspace button.

Using the Barcode Reader and Deckspace Tab

To load the deckspace using the barcode reader and the Deckspace tab:

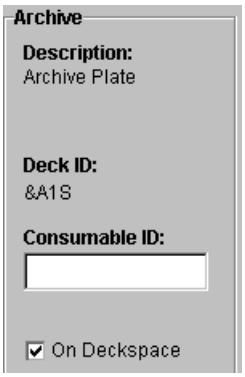
Step	Action
1	Empty the bin (see “Emptying the Tip Eject Bin” on page 5-4).
2	In the **Deckspace** tab: a. Click the **TIP BIN** button to activate the tip eject bin. b. Using the mouse, check the **On Deckspace** check box. 

To load the deckspace using the barcode reader and the Deckspace tab: *(continued)*

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Using the barcode reader, scan a barcode on the deckspace.

⚠ WARNING LASER HAZARD. Exposure to direct or reflected laser light can burn the retina and leave permanent blind spots. Never look into the laser beam. Remove jewelry and anything else that can reflect the beam into your eyes. Protect others from exposure to the beam.

♦ Details about the deckspace location appear in the Archive section of the Deckspace tab.
♦ The Consumable ID field becomes active.
♦ The software checks the On Deckspace check box.

 
</td></tr>
<tr><td>4</td><td><table>
<tr><th>If the required input…</th><th>Then…</th></tr>
<tr><td>has a barcode</td><td>scan the input barcode.

The software updates the Consumable ID field with the barcode.</td></tr>
<tr><td>does not have a barcode</td><td>either:

♦ Leave the Consumable ID field empty.

or

♦ Enter notes in the Consumable ID field.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Place the required input in the station.

⚠ CAUTION CHEMICAL HAZARD. RNA Purification Lysis Solution may cause eye, skin, and respiratory tract irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

⚠ CAUTION CHEMICAL HAZARD. RNA Purification Wash Solution 1 may cause eye, skin, and respiratory tract irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

⚠ WARNING CHEMICAL HAZARD. RNA Purification Wash Solution 2 is a flammable liquid and vapor. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.</td></tr>
</table>

To load the deckspace using the barcode reader and the Deckspace tab: *(continued)*

Step	Action
6	Repeat step 1 through step 5 until you place all of the following items on the deckspace: ♦ Plates ♦ Purification tray ♦ Tips ♦ Reagent reservoirs ♦ Master mix ♦ Standards and controls ♦ Optical heat-seal covers ♦ Archive covers ♦ Splash guard

Using the Deckspace Setup Window

To load the deckspace using the Deckspace Setup window:

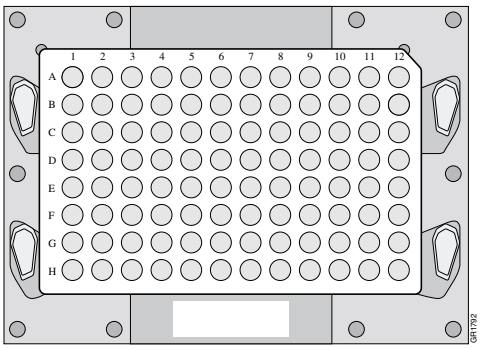
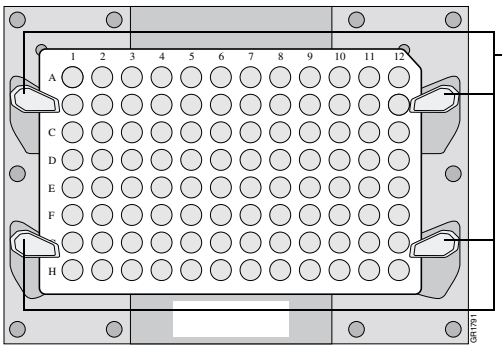
Step	Action
1	Go to the **Deckspace** tab and click the **Set Up Deckspace** button. The **Deckspace Setup** window appears.
2	Using the barcode reader, perform the tasks listed on each tab: ♦ Plates ♦ Tips ♦ Reagents ♦ Master mix ♦ Standards ♦ Misc. **⚠ WARNING LASER HAZARD.** Exposure to direct or reflected laser light can burn the retina and leave permanent blind spots. Never look into the laser beam. Remove jewelry and anything else that can reflect the beam into your eyes. Protect others from exposure to the beam.
3	Click **Done**. The **Deckspace Setup** dialog box closes and the **Deckspace** tab becomes active.

Placing Required Consumables, Reagents, or Placeholders

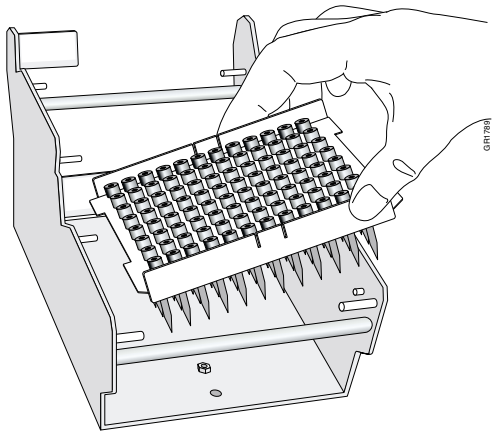
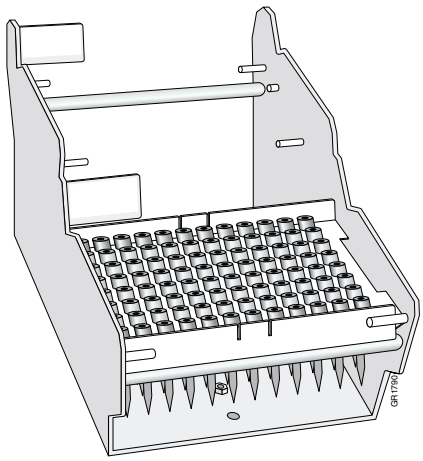
Most of the steps in this procedure require use of the barcode reader. Please note the warning below.

⚠ WARNING LASER HAZARD. Exposure to direct or reflected laser light can burn the retina and leave permanent blind spots. Never look into the laser beam. Remove jewelry and anything else that can reflect the beam into your eyes. Protect others from exposure to the beam.

To place the required items on the deckspace:

Step	Action
1	Set up the plates: a. Using the barcode reader, scan a plate location barcode on the deckspace. b. Scan the barcode of the plate. c. Place the plate in its correct location on the deckspace. d. Repeat steps a through c until you place all plates on the deckspace. **IMPORTANT** Load empty placeholder plates to minimize condensation on the deckspace.
2	If you are performing an RNA/DNA Archive protocol, set up the purification tray: a. Using the barcode reader, scan the purification tray carriage barcode. b. Scan the barcode of the purification tray. **IMPORTANT** Make sure you load the appropriate purification tray for the nucleic acid you are purifying. c. Firmly place the purification tray in the purification tray carriage.  d. Move the four pins to lock the purification tray in place.  Move the four pins to lock the purification tray in place

To place the required items on the deckspace: *(continued)*

Step	Action
3	Set up the disposable conductive pipette tips: a. Using the barcode reader, scan a tip rack barcode on the deckspace. b. Place the required tips on the deckspace.   c. Repeat steps a and b until you place all tips on the deckspace. **Note** Disposable tip positions 1–4 only accommodate 200-µL tips. Positions 5–8 accommodate 200- or 1000-µL tips. Load the tip size indicated by the **Deckspace** tab in the 6700 software.

To place the required items on the deckspace: *(continued)*

Step	Action
4	Set up the reagent reservoirs: a. Using the barcode reader, scan a reagent reservoir barcode on the deckspace. b. Fill a reagent reservoir with the specified amount of reagent. c. Repeat steps a and b until you place all reagents on the deckspace. **⚠ CAUTION** **CHEMICAL HAZARD**. **RNA Purification Lysis Solution** may cause eye, skin, and respiratory tract irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ CAUTION** **CHEMICAL HAZARD**. **RNA Purification Wash Solution 1** may cause eye, skin, and respiratory tract irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ WARNING** **CHEMICAL HAZARD**. **RNA Purification Wash Solution 2** is a flammable liquid and vapor. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
5	Set up the master mixes: a. Using the barcode reader, scan a master mix barcode on the deckspace. b. Place master mixes or an empty tube into the specified deckspace position. c. Repeat steps a and b until you place all required master mix tubes on the deckspace. **IMPORTANT** Load empty placeholder tubes to minimize condensation on the deckspace.
6	Set up specified standards, controls, and empty placeholder tubes: a. Place all specified standards, controls, and empty placeholder tubes in position on the deckspace. b. Click each standard/control/placeholder and use the mouse to check each item as **On Deckspace**. c. Repeat step c until all standards positions are checked as **On Deckspace**. **IMPORTANT** Load empty placeholder tubes to minimize condensation on the deckspace.
7	Set up the optical heat-seal covers: a. Using the barcode reader, scan the optical heat-seal covers barcode on the deckspace. b. Place the optical heat-seal covers in position. **⚠ CAUTION** Place optical heat-seal covers with the dull side facing downward and the shiny side facing upward. Incorrect placement will cause irreparable damage to the heat sealer. **IMPORTANT** Make sure to put enough optical heat-seal covers in the Heat-Seal station for your run, however, never add more than six. If you add more than six optical heat-seal covers, the instrument may fail to pick them up and seal the output plates.

To place the required items on the deckspace: *(continued)*

Step	Action
8	Set up the archive covers: a. Using the barcode reader, scan an archive cover barcode on the deckspace. b. Place an archive cover in position on the deckspace. c. Repeat steps a and b until you place all required archive covers on the deckspace.
9	Set up the splash guard: a. Scan the waste position barcode on the deckspace. b. Place a splash guard in the waste position. **IMPORTANT** The splash guard is a blue plate with bottomless wells. Do not load a 96-well optical plate in the waste position or waste will collect on the deckspace.

Verifying the Deckspace

To verify the deckspace:

Step	Action
1	Verify that all active stations on the **Deckspace** tab are green. **Note** This indicates that all required deckspace stations are marked as on the deckspace.
2	Verify that all required items are placed in the appropriate deckspace position.
3	Verify that the volumes for reagents, master mixes, standards, and controls are correct. **IMPORTANT** Missing items or insufficient amounts may cause the 6700 instrument to quit the run.

Instrument Run

Instrument Run Overview

The instrument run occurs via the Instrument tab of the 6700 software. The process involves the following stages:

Stage	See Page
Starting a Run	3-31
Pausing a Run (optional)	3-32
Completing a Run	3-32

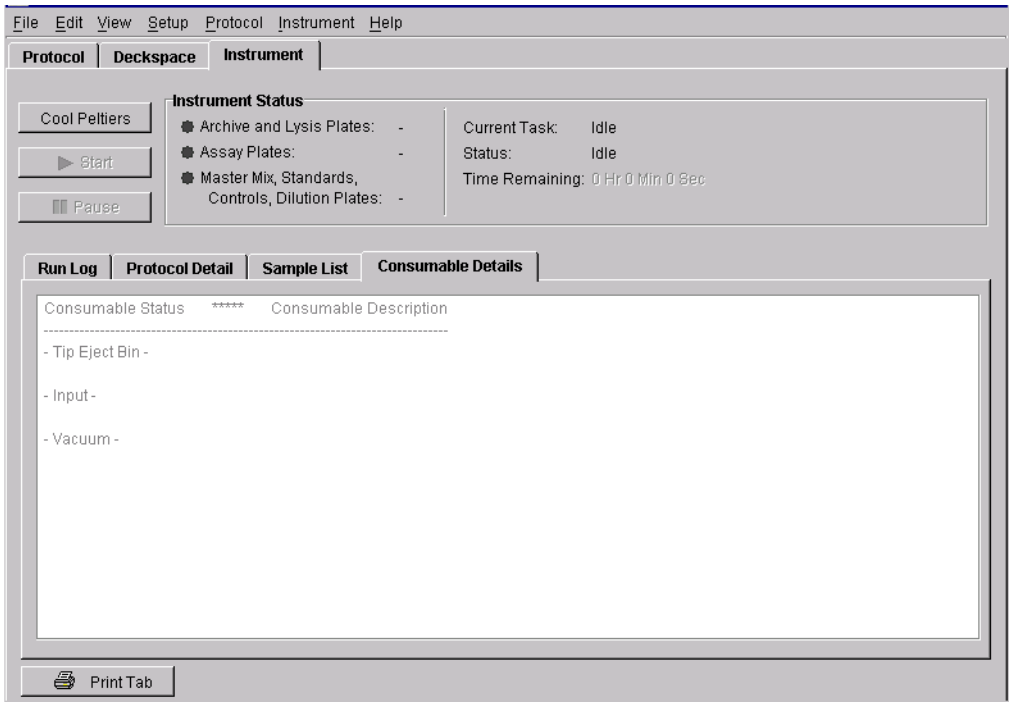
Instrument Tab View

Accessing the Instrument Tab

To access the Instrument tab:

Step	Action
1	Launch the 6700 software. The **Protocol** tab is automatically displayed.
2	Click the **Instrument** tab. The **Instrument** tab is displayed, as shown below.

The figure below shows the different areas of the Instrument tab.



Guidelines for Instrument Runs

Follow the guidelines below during an instrument run.

- Do not use the barcode reader during the run.
- Do not disconnect the barcode reader from the client computer or server computer during the run or while either computer is turned on. If you try to disconnect the barcode reader while either computer is running, the systems will fail.
- If you pause the run, wait for the robotic arm to stop moving before opening the instrument door.

IMPORTANT Opening the instrument door before the robotic arm stops moving shuts down power to the robotic arm and quits the run.

Starting a Run

To start a run:

Step	Action
1	Close the instrument door.
2	Go to the **Instrument** tab of the 6700 software.
3	Click the **Start** button. The software verifies that all required items are marked as **On Deckspace**. If you forgot to scan a station on the deckspace, an error message will appear asking you to return to the **Deckspace** tab.
4	Make sure the instrument door is completely closed before proceeding.  Click **OK**.
5	Enter a name for the run in the **Name Run** dialog box that appears.  **Note** The run name must contain fewer than 25 characters. Click **OK**. If you have not already clicked the **Cool Peltiers** button, the Peltier units begin to cool. **Note** If the run includes a cDNA Archive protocol, the instrument stops cooling the Dilutions/cDNA station at this time.
6	Click the **Run Log** tab to monitor the process.

Pausing a Run

To pause a run:

Step	Action
1	While the instrument is running, click the **Pause** button on the **Instrument** tab. The robotic arm continues to move until the protocol reaches an appropriate time to pause. A message appears on the computer indicating that the robotic arm has reached a safe position and that you may now open the door.
2	Wait for the above message to appear, then open the instrument door. **⚠ CAUTION** Opening the instrument door while the robotic arm is moving shuts off power to the robotic arm and causes the 6700 workstation to quit the run. If you open the instrument door before the robotic arm stops moving, you must restart the 6700 instrument and 6700 software before continuing. Failure to restart may damage the robotic arm.
3	Resume the run: a. Close the instrument door. b. In the 6700 software, click **OK** to close the error message. c. Click the **Resume** button on the **Instrument** tab.

Completing a Run

Cooled Stations

After a run is completed, the instrument maintains the following stations at the temperatures indicated below.

Station	Temperature
Input station	4 °C
Standards, Master Mix/Cell Lysate Control station	
Dilutions/cDNA station	
Output station	4 °C to 15 °C **Note** To select the temperature setpoint for the output plates, see “Cooling the Deckspace” on page 3-21.

Completing a Run

To complete a run:

Step	Action
1	Verify that the run is completed by checking the **Instrument Status** section of the **Instrument** tab.
2	Open the door of the 6700 instrument.

To complete a run: *(continued)*

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Clear the deckspace:
a. Remove the archive plate(s) and/or output plate(s) from the deckspace.
b. Store the plates until needed.

<table>
<tr><th>Output Plate</th><th>Deckspace Location</th><th>Recommended Storage Temperature</th></tr>
<tr><td>Lysed cells</td><td>Input station</td><td>2 to 8 °C</td></tr>
<tr><td>RNA/DNA archive</td><td>Vacuum station</td><td>–15 to –25 °C</td></tr>
<tr><td>Deep-well</td><td>Vacuum station</td><td>N/A[a]</td></tr>
<tr><td>cDNA archive[b]</td><td>Dilutions/cDNA station</td><td>–15 to –25 °C</td></tr>
<tr><td>Dilution archive</td><td>Dilutions/cDNA station</td><td>–15 to –25 °C</td></tr>
<tr><td>Output plate</td><td>Output station</td><td>2 to 8 °C</td></tr>
</table>
a. Manually reposition the deep-well plate to obtain DNA output.

b. The archive cover may contain condensation. Briefly centrifuge the plate with the cover on to collect contents at the bottom of the wells before storing the plate or using it in another run.</td></tr>
<tr><td>4</td><td>Click the Turn Peltiers Off button.

Note This is a toggle button: Turn Peltiers Off and Cool Peltiers.

⚠ CAUTION If you leave the Peltier units on, condensation will collect on the deckspace. If this occurs, the temperature sensors may malfunction and report inaccurate deckspace temperatures.</td></tr>
</table>

After the Instrument Run

After the Instrument Run Overview

After the instrument run you can perform the following tasks:

Task	See Page
Using Output Plate Setup Files with the 7700 SDS	3-34
Using Output Plate Setup Files with the 7900HT SDS	3-35
About the Run History	3-35

About Output Plate Setup Files

After the run, the 6700 database exports information about each output plate in an output plate setup file.

File Attribute	Output Plate Setup File Information
Location	D:\pebio\6700\Output Plate Setup Files
Name	**If you…** / **Then the file is named with the…** scanned consumable IDs / consumable ID. did not scan consumable IDs / year-month-day and the output plate number.

Using Output Plate Setup Files with the 7700 SDS

IMPORTANT Only 96-well optical plates can be used with the ABI PRISM® 7700 Sequence Detection System (7700 SDS). If you are using 384-well optical plates, see “Using Output Plate Setup Files with the 7900HT SDS” on page 3-35.

To use output plate setup files with the 7700 SDS:

Step	Action
1	Locate the output plate setup files on the client computer’s hard drive: a. Go to **D:\pebio\6700\Output Plate Setup Files** on the client computer. b. Find the appropriate output plate setup file. **Note** The setup file is named with the consumable ID or with the year-month-day and output plate number.
2	Use a floppy disk to transfer the file to the 7700 SDS.
3	Launch the 7700 SDS software on the 7700 SDS computer. Close the untitled window that appears.
4	Create a new file with the settings appropriate for your assay: a. From the **File** menu, select **New Plate…** b. Choose appropriate options in the **New Plate** dialog box. c. Click **OK**. A new window appears in the setup view.
5	From the **File** menu, scroll to **Import** and select **Import Setup File**.
6	Locate the appropriate output plate setup file and click **Open**. The 7700 SDS software imports the plate setup information.

Using Output Plate Setup Files with the 7900HT SDS

To use output plate setup files with the 7900HT SDS:

Step	Action
1	Locate the output plate setup files on the client computer's hard drive: a. Go to **D:\pebio\6700\Output Plate Setup Files** on the client computer. b. Find the appropriate output plate setup file. **Note** The setup file is named with the consumable ID or with the year-month-day and output plate number.
2	Transfer the file to the ABI PRISM® 7900HT Sequence Detection System (7900HT SDS) computer. **If the 6700 database server is…** / **Then transfer the file using…** networked / the network. not networked / a floppy disk.
3	Launch the 7900HT SDS software on the 7900HT SDS computer. Close the untitled window that appears.
4	Create a new file with the settings appropriate for your assay: a. From the **File** menu, select **New Plate…** b. Choose appropriate options in the **New Plate** dialog box. c. Click **OK**. A new window appears in the setup view.
5	From the **File** menu, scroll to **Import** and select **Import Setup File**.
6	Locate the appropriate output plate setup file and click **Open**. The 7900HT SDS software imports the plate setup information.

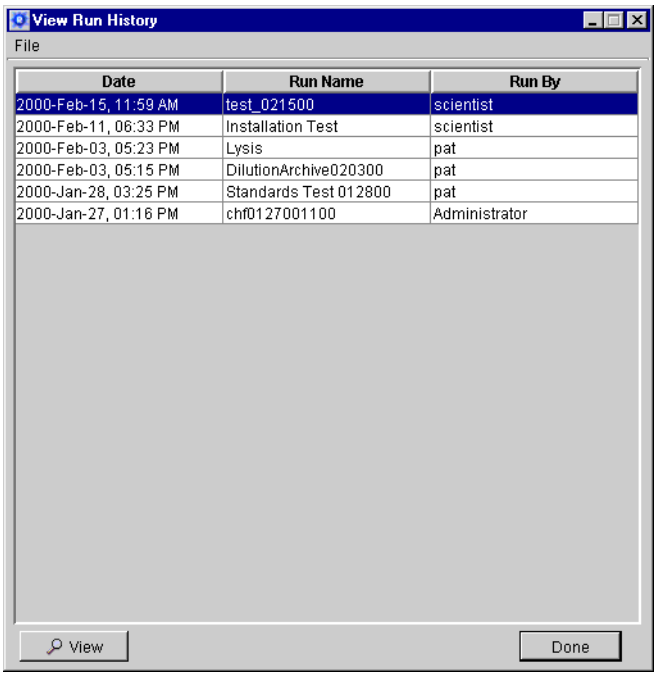
About the Run History

The 6700 database stores the history of all runs. The run history includes the following information:

- Date of the run
- Run name
- User name
- Protocol tab information
- Deckspace tab information
- Instrument tab information

Viewing the Run History

To view the run history:

Step	Action
1	In the 6700 software, go to the **File** menu.
2	Select **View Run History**. A **View Run History** window appears. 
3	Locate the run you want to view and select it by clicking it. **Note** Click **Date**, **Run Name**, or **Run By** in the header row to sort the runs.
4	Click the **View** button. The **Run History** file with the **Protocol** tab, **Deckspace** tab, and **Instrument** tab appears.
5	Close the **Run History** file when finished.
6	Close the **View Run History** window when finished.

4 Protocol Creation

Overview

About This Chapter

This chapter describes the types of protocols that the ABI PRISM™ 6700 Automated Nucleic Acid Workstation can perform, how these protocols flow, the protocol conditions, and the procedures for creating and defining each type of protocol.

In This Chapter

Topic	See Page
Protocol Overview	4-2
Using the Protocol Browser	4-6
Section: Lysis Protocols	4-11
Lysis Protocol Overview	4-11
Lysis Protocol Creation	4-12
Section: DNA Precipitation Protocols	4-15
DNA Precipitation Protocol Overview	4-15
DNA Precipitation Protocol Creation	4-16
Section: RNA Archive Protocols	4-19
RNA Archive Protocol Overview	4-19
RNA Archive Protocol Creation	4-21
Section: DNA Archive Protocols	4-31
DNA Archive Protocol Overview	4-31
DNA Archive Protocol Creation	4-33
Section: cDNA Archive Protocols	4-43
cDNA Archive Protocol Overview	4-43
cDNA Archive Protocol Creation	4-44
Section: Dilution Archive Protocols	4-47
Dilution Archive Protocol Overview	4-47
Dilution Archive Protocol Creation	4-48
Section: Assay Protocols	4-53
Assay Protocol Setup	4-54
Assay Protocol Creation Overview	4-61
Assay Protocol Creation for 96-Well Output	4-70
Assay Protocol Creation for 384-Well Output	4-79

Protocol Overview

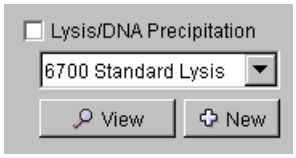
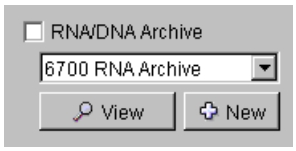
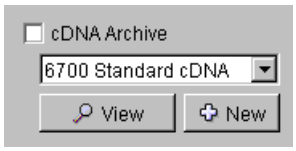
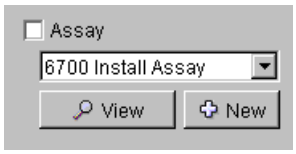
About Designing Runs

The 6700 workstation automates cell lysis, nucleic acid purification, dilution, and assay setup. Use this section to familiarize yourself with the following:

- Descriptions of protocols that the 6700 workstation can perform
- How protocols flow on the 6700 workstation to generate the desired output

About the Protocols

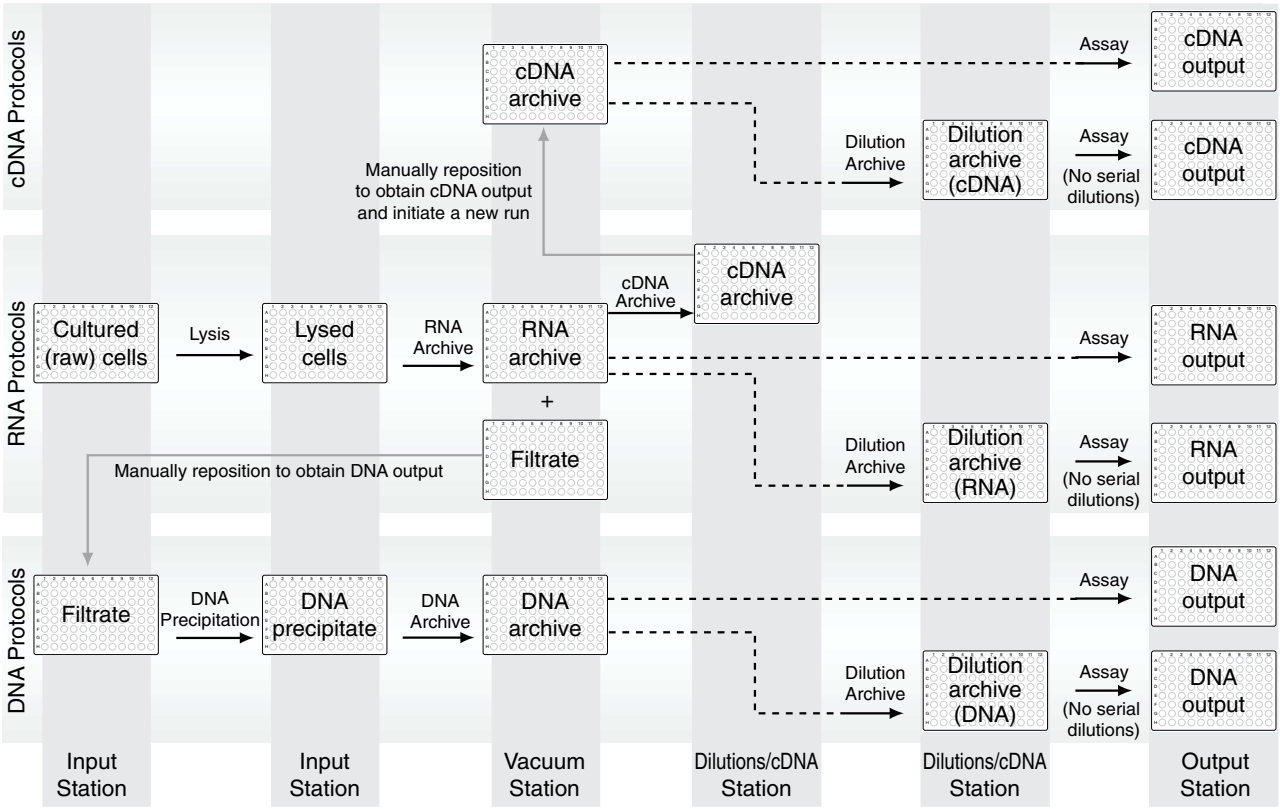
The 6700 workstation can perform five basic protocols, which can be customized depending on your application.

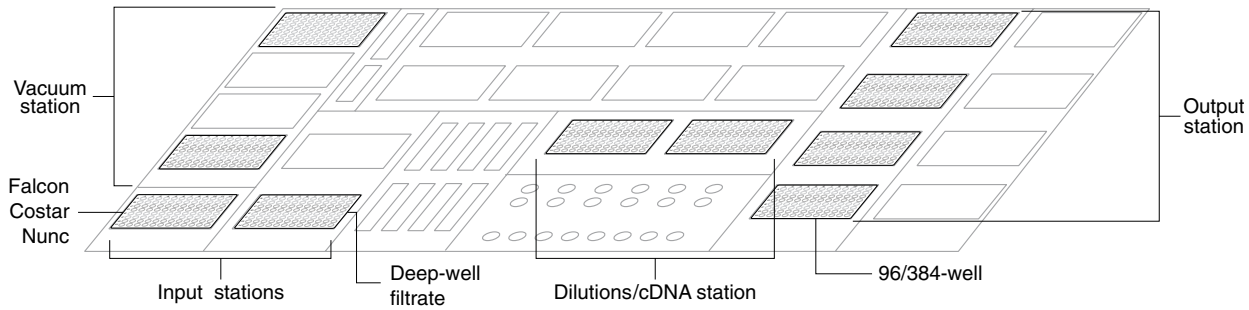
6700 Protocol	Purpose	See Page
Lysis/DNA Precipitation 	♦ To lyse cells with Applied Biosystems reagents ♦ To precipitate DNA with Applied Biosystems reagents	4-11, 4-15
RNA/DNA Archive 	♦ To purify RNA ♦ To purify DNA	4-19, 4-31
cDNA Archive 	To synthesize cDNA from RNA	4-43
Dilution Archive 	To dilute RNA, DNA, or cDNA	4-47
Assay 	To prepare output plates for assays	4-53

Protocol Flow

The figure below shows the protocols possible on the 6700 workstation, the flow of these protocols, the input and output plates, and the location of input and output plates on the deckspace.

IMPORTANT Assay protocols that specify sample dilutions cannot follow Dilution Archive protocols.





Configurations for the Output Station

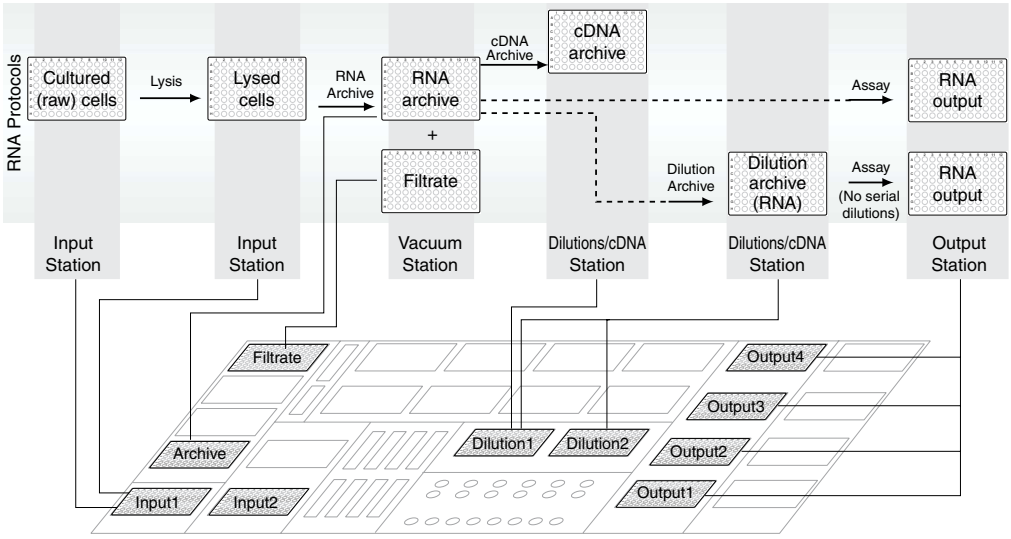
The Output station can be configured as follows:

Platform	Configuration
96-well	♦ Four 96-well optical plates
384-well	♦ Three 96-well optical plates ♦ One 384-well optical plate **Note** 96-well and 384-well optical plates cannot be run simultaneously.

Protocol Flow for RNA Output

The flow chart below shows the protocols that the 6700 instrument performs to prepare plates containing RNA, the flow of these protocols, the input and output plates, and the location of input and output plates on the deckspace.

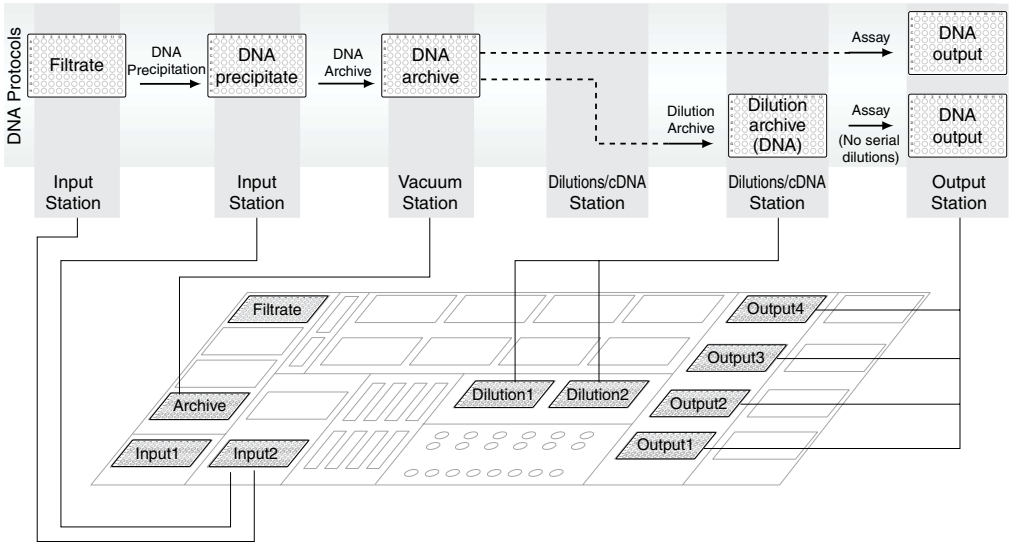
IMPORTANT Assay protocols that specify sample dilutions cannot follow Dilution Archive protocols.



Protocol Flow for DNA Output

The flow chart below shows the protocols that the 6700 instrument performs to prepare plates containing DNA, the flow of these protocols, the input and output plates, and the location of input and output plates on the deckspace.

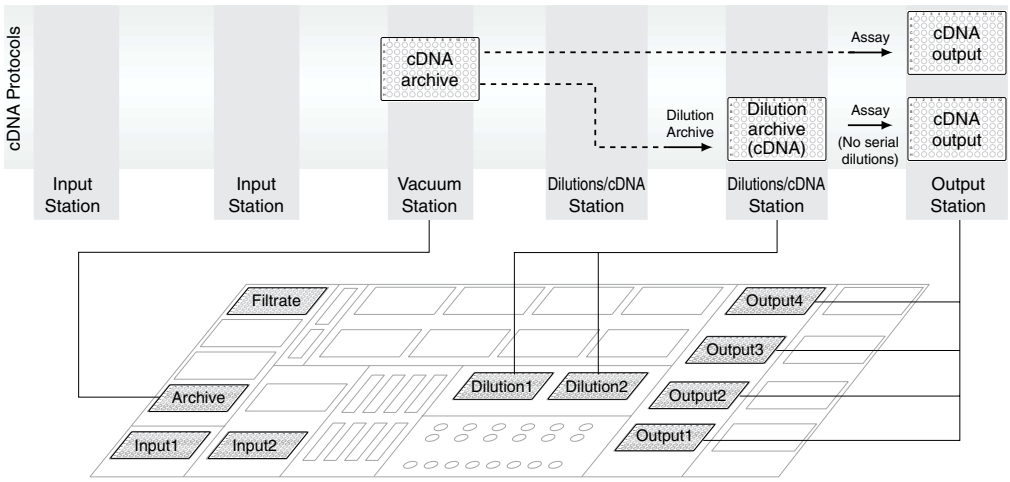
IMPORTANT Assay protocols that specify sample dilutions cannot follow Dilution Archive protocols.



Protocol Flow for cDNA Output

The flow chart below shows the protocols that the 6700 instrument performs to prepare plates containing cDNA, the flow of these protocols, the input and output plates, and the location of input and output plates on the deckspace.

IMPORTANT Assay protocols that specify sample dilutions cannot follow Dilution Archive protocols.



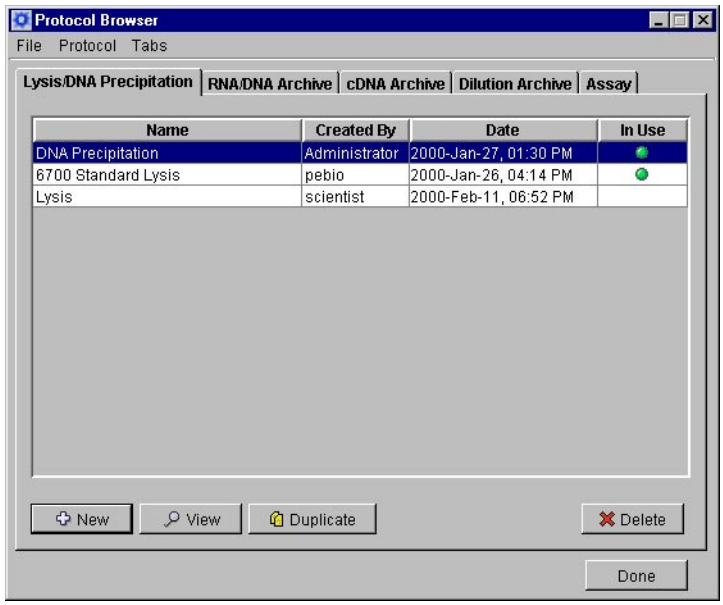
Using the Protocol Browser

About the Protocol Browser

The Protocol Browser contains all 6700 workstation protocols created or used in an instrument run.

Accessing the Protocol Browser Window

To access the Protocol Browser window:

Step	Action
1	In the ABI PRISM™ 6700 Automated Nucleic Acid Workstation software, go to the **Setup** menu.
2	Select **Protocol Browser**. The **Protocol Browser** window opens. 

When to Use the Protocol Browser

Use the Protocol Browser to perform the following:

- Create protocols
- Duplicate and edit protocols
- Delete protocols
- Change protocol use settings

Creating Protocols

To create protocols with the Protocol Browser:

Step	Action
1	In the **Protocol Browser** window, click the tab of the type of protocol you want to create: ♦ Lysis/DNA Precipitation ♦ RNA/DNA Archive ♦ cDNA Archive ♦ Dilution Archive ♦ Assay
2	Click the **New** button. A **New Protocol** dialog box appears.
3	Complete the dialog box as described in this chapter.

If you want to create…	Then see page…
a Lysis protocol	4-11
a DNA Precipitation protocol	4-15
an RNA Archive protocol	4-19
a DNA Archive protocol	4-31
a cDNA Archive protocol	4-43
a Dilution Archive protocol	4-47
an Assay protocol	4-53

4	Click **OK** when you are finished entering protocol conditions.

Duplicating and Editing Protocols

To duplicate and edit a protocol:

Step	Action
1	In the **Protocol Browser** window, click the tab of the type of protocol you want to duplicate: ♦ Lysis/DNA Precipitation ♦ RNA/DNA Archive ♦ cDNA Archive ♦ Dilution Archive ♦ Assay
2	Select the protocol you want to duplicate by clicking it once. The selected protocol is highlighted. **Note** Default preference settings allow you to see all protocols in the database. To see only protocols that you created, change your preference settings (“Setting Preferences” on page 3-7).
3	Click the **Duplicate** button. A protocol dialog box appears with the settings of the protocol you selected.

To duplicate and edit a protocol: *(continued)*

Step	Action
4	Enter a **Protocol Name**. **Note** The protocol name must be: ♦ A unique combination of letters, numbers, and spaces ♦ No more than 32 characters long
5	To edit the protocol, change the settings.
6	Click **OK** to add the duplicated or edited protocol and to return to the **Protocol Browser**.

Deleting Protocols

To delete a protocol, it must fulfill the following criteria:

- You created the protocol.
- The protocol was never used in an instrument run.

To delete a protocol:

Step	Action
1	In the **Protocol Browser** window, click the tab of the type of protocol you want to delete: ♦ Lysis/DNA Precipitation ♦ RNA/DNA Archive ♦ cDNA Archive ♦ Dilution Archive ♦ Assay
2	Select the protocol you want to delete by clicking it once. The selected protocol is highlighted. **Note** The 6700 database requires protocol information for all protocols used in instrument runs to keep the run history intact. See the next section, “Changing Protocol Use Settings,” to remove a protocol from use if you do not want it to appear in the protocol pop-up menu on the **Protocol** tab.
3	Click the **Delete** button. The software asks whether you really want to delete the protocol.
4	Click **OK** to delete the protocol and to return to the **Protocol Browser**.

Changing Protocol Use Settings

Change the use settings to perform the following:

- Remove a protocol from use if you do not want it to appear in the protocol pop-up menu on the Protocol tab.
- Add a protocol for use if you want to use the protocol in an instrument run.

To change use settings:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>In the Protocol Browser window, click the tab of the type of protocol for which you want to change In Use settings:
♦ Lysis/DNA Precipitation
♦ RNA/DNA Archive
♦ cDNA Archive
♦ Dilution Archive
♦ Assay</td></tr>
<tr><td>2</td><td>Double-click the protocol you want to set.
A View Protocol dialog box appears.</td></tr>
<tr><td>3</td><td><table><tr><th>If you want to…</th><th>Then…</th></tr><tr><td>remove the protocol from use</td><td>uncheck the In Use box.</td></tr><tr><td>add the protocol for use</td><td>check the In Use box.</td></tr></table></td></tr>
<tr><td>4</td><td>Click OK to change the setting and to return to the Protocol Browser.</td></tr>
</table>

Section: Lysis Protocols

In This Section The following topics are covered in this section:

Topic	See Page
Lysis Protocol Overview	4-11
Lysis Protocol Creation	4-12

Lysis Protocol Overview

Description During a Lysis protocol, the 6700 workstation lyses cells with Applied Biosystems reagents.

Lysis Process The table below describes how the 6700 workstation performs a Lysis protocol.

Lysis Process

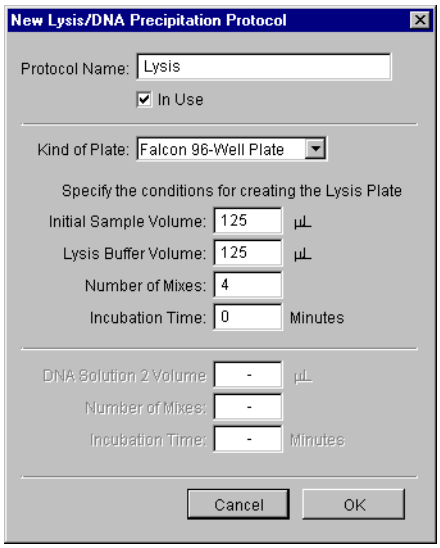
Stage	Description
1	The 6700 instrument adds lysis buffer to the samples in the input plate.
2	The 6700 instrument mixes the samples and lysis buffer.
3	The instrument incubates the plate containing the samples and lysis buffer at 4 °C. **Note** Incubation is optional.

Output Applications Lysis output can be used for RNA Archive protocols.

Lysis Protocol Creation

Lysis Conditions

When you create a new Lysis protocol, you define the conditions displayed in the New Lysis/DNA Precipitation Protocol dialog box, as shown below.



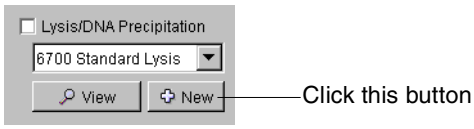
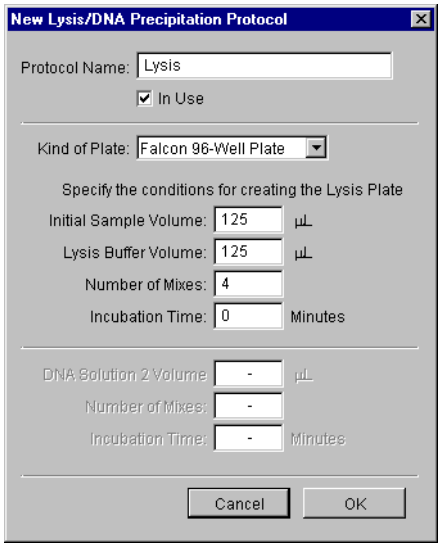
These conditions are described in the table below.

Lysis Protocol Conditions

Condition	Description	Accepted Values
Protocol Name	A unique name for a specific Lysis protocol	♦ A unique combination of letters, numbers, and spaces ♦ Up to 32 characters
Kind of Plate	The kind of input plate to use	♦ Input 1: – Falcon 96-well plate – Costar 3596 plate – Nunc 168055 plate ♦ Input 2 or 3: – Deep-well plate
Initial Sample Volume	The volume of raw cells in the input plate	10 to 200 µL **Note** The sum of the **Initial Sample Volume** and **Lysis Buffer Volume** must be ≤300 µL.
Lysis Buffer Volume	The volume of lysis buffer to add to raw cells	10 to 200 µL **Note** The sum of the **Initial Sample Volume** and **Lysis Buffer Volume** must be ≤300 µL.
Number of Mixes	The number of times to mix the raw cells and lysis buffer by pipetting up and down	0 to 9 times
Incubation Time	The length of time to incubate the samples with lysis buffer at 4 °C	0 to 99 minutes

Creating Lysis Protocols

To create Lysis protocols:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **Lysis/DNA Precipitation** protocol.  The **New Lysis/DNA Precipitation Protocol** dialog box appears. 
3	Enter a **Protocol Name**.

Defining Lysis Conditions

To define lysis conditions:

Step	Action
1	Select the plate that will be used from the **Kind of Plate** pop-up menu.
2	Enter a value from 10 to 200 (µL) for **Initial Sample Volume**. **Note** The sum of the **Initial Sample Volume** and **Lysis Buffer Volume** must be ≤300 µL.
3	Enter a value from 10 to 200 (µL) for **Lysis Buffer Volume**. **Note** The sum of the **Initial Sample Volume** and **Lysis Buffer Volume** must be ≤300 µL.
4	Enter a value from 0 to 9 for **Number of Mixes**.
5	Enter a value from 0 to 99 (minutes) for **Incubation Time**.
6	Click **OK** to save this protocol and to return to the **Protocol** tab.

Section: DNA Precipitation Protocols

In This Section

The following topics are covered in this section:

Topic	See Page
DNA Precipitation Protocol Overview	4-15
DNA Precipitation Protocol Creation	4-16

DNA Precipitation Protocol Overview

Description

During a DNA Precipitation protocol, the 6700 workstation adds up to two solutions to filtrate in a deep-well plate to precipitate DNA.

DNA Precipitation Process

The table below describes how the 6700 workstation performs a DNA Precipitation protocol.

DNA Precipitation Process

Stage	Description
1	The 6700 instrument adds solution 1 to the filtrate plate.
2	The 6700 instrument mixes filtrate and solution 1.
3	The instrument incubates the plate containing the filtrate-solution 1 mixture at 4 °C. **Note** Incubation is optional.
4	The 6700 instrument adds solution 2 to the filtrate-solution 1 mixture.
5	The 6700 instrument mixes the filtrate-solution 1-solution 2 mixture.
6	The instrument incubates the plate containing filtrate, solution 1, and solution 2 at 4 °C. **Note** Incubation is optional.

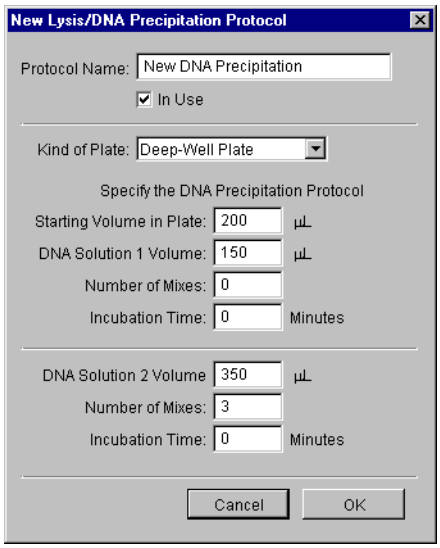
Output Applications

DNA precipitation output can be used for DNA Archive protocols.

DNA Precipitation Protocol Creation

DNA Precipitation Conditions

When you create a new DNA Precipitation protocol, you define the conditions displayed in the New Lysis/DNA Precipitation Protocol dialog box, as shown below.



These conditions are described in the table below.

DNA Precipitation Protocol Conditions

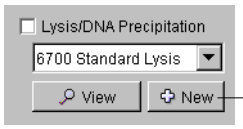
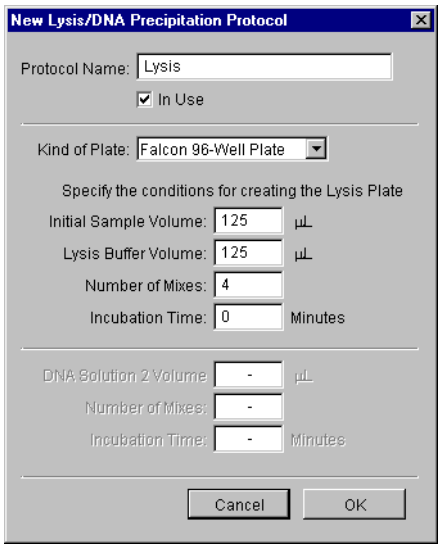
Condition	Description	Accepted Values
Protocol Name	A unique name for a specific DNA Precipitation protocol	♦ A unique combination of letters, numbers, and spaces ♦ Up to 32 characters
Kind of Plate	The kind of input plate to use	Deep-well plate
Starting Volume in Plate	The starting volume in the deep-well plate	≥10 µL **Note** The sum of the **Starting Volume in Plate**, **DNA Solution 1 Volume**, and **DNA Solution 2 Volume** must be ≤850 µL.
DNA Solution 1 Volume	The volume of solution 1 to add to the deep-well plate	≥10 µL **Note** The sum of the **Starting Volume in Plate**, **DNA Solution 1 Volume**, and **DNA Solution 2 Volume** must be ≤850 µL.
Number of Mixes	The number of times to mix the filtrate and solution 1 by pipetting up and down	0 to 9 times
Incubation Time	The length of time to incubate the filtrate-solution 1 mixture at 4 °C	0 to 99 minutes
DNA Solution 2 Volume	The volume of solution 2 to add to the filtrate-solution 1 mixture.	≥0 µL **Note** The sum of the **Starting Volume in Plate**, **DNA Solution 1 Volume**, and **DNA Solution 2 Volume** must be ≤850 µL.
Number of Mixes	The number of times to mix the filtrate-solution 1-solution 2 mixture by pipetting up and down	0 to 9 times

DNA Precipitation Protocol Conditions *(continued)*

Condition	Description	Accepted Values
Incubation Time	The length of time to incubate the filtrate-solution 1-solution 2 mixture at 4 °C	0 to 99 minutes

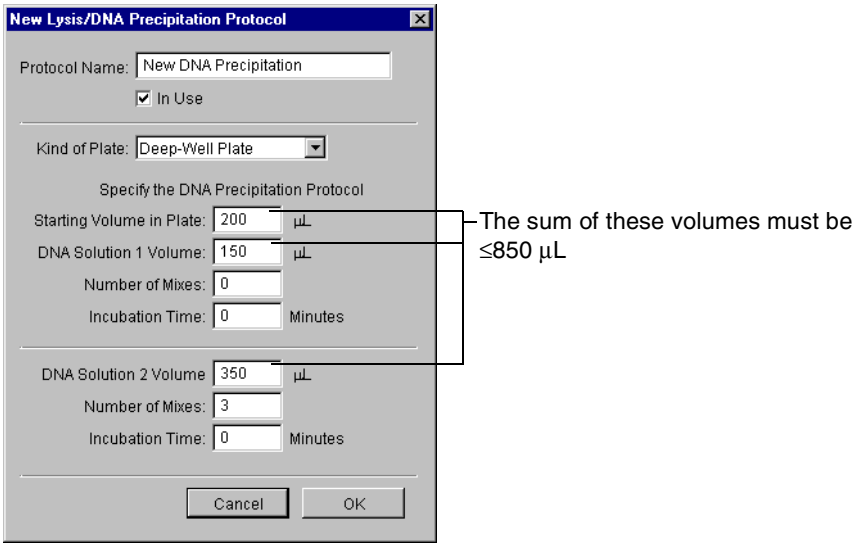
Creating DNA Precipitation Protocols

To create DNA Precipitation protocols:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **Lysis/DNA Precipitation** protocol.  The **New Lysis/DNA Precipitation Protocol** dialog box appears. 
3	Enter a **Protocol Name**.

Defining DNA Precipitation Conditions

To define DNA precipitation conditions:

Step	Action
1	Select **Deep-Well Plate** from the **Kind of Plate** pop-up menu. The dialog box changes to show conditions for defining a DNA Precipitation protocol. 
2	Enter a value ≥10 (µL) for **Starting Volume in Plate**. **Note** The sum of the **Starting Volume in Plate**, **DNA Solution 1 Volume**, and **DNA Solution 2 Volume** must be ≤850 µL.
3	Enter a value ≥10 (µL) for **DNA Solution 1 Volume**. **Note** The sum of the **Starting Volume in Plate**, **DNA Solution 1 Volume**, and **DNA Solution 2 Volume** must be ≤850 µL.
4	Enter a value from 0 to 9 for **Number of Mixes**.
5	Enter a value from 0 to 99 (minutes) for **Incubation Time**.
6	Enter a value ≥0 µL for **DNA Solution 2 Volume**. **Note** The sum of the **Starting Volume in Plate**, **DNA Solution 1 Volume**, and **DNA Solution 2 Volume** must be ≤850 µL.
7	Enter a value from 0 to 9 for **Number of Mixes**.
8	Enter a value from 0 to 99 (minutes) for **Incubation Time**.
9	Click **OK** to save this protocol and to return to the **Protocol** tab.

Section: RNA Archive Protocols

In This Section The following topics are covered in this section:

Topic	See Page
RNA Archive Protocol Overview	4-19
RNA Archive Protocol Creation	4-21

RNA Archive Protocol Overview

Description During an RNA Archive protocol, the 6700 workstation purifies RNA from cells lysed with Applied Biosystems reagents.

RNA Archive Process The table below describes how the 6700 workstation performs an RNA Archive protocol.

RNA Archive Process

Stage	Description
1	The 6700 instrument transfers cell lysate to a purification tray, which contains a filter in each well.
2	The 6700 instrument applies vacuum pressure to the purification tray: a. The filter captures the RNA. b. DNA and other cellular debris flow through the filter into a filtrate plate or waste. **Note** You can save the filtrate from this step for use in another run to purify DNA.
3	The 6700 instrument washes the filter-bound RNA.
4	The 6700 instrument elutes the RNA: a. The instrument adds elution solution to release the RNA from the filter. b. The instrument applies vacuum pressure to the purification tray. c. The purified RNA elutes into the RNA archive plate at the vacuum station.
5	If specified, the 6700 instrument adds a final addition fluid: a. The instrument adds a final addition fluid, as specified by the user. b. The instrument applies vacuum pressure to the purification tray. c. The purified RNA elutes into the RNA archive plate at the vacuum station.
6	If specified, the 6700 instrument covers the RNA archive plate with an archive cover.

Output Applications

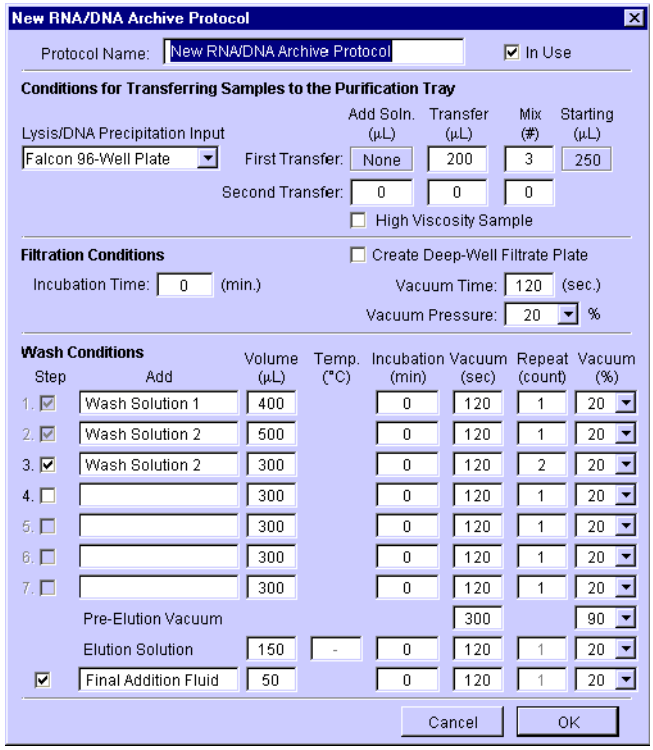
RNA archive output can be used for:

- cDNA Archive protocols
- Dilution Archive protocols
- Assay protocols
- Northern blots, cDNA cloning, and transcript imaging
- Long-term storage at –80 °C

RNA Archive Protocol Creation

RNA Archive Conditions

When you create a new RNA Archive protocol, you define the conditions displayed in the New RNA/DNA Archive Protocol dialog box, as shown below.



These conditions are described in the table below.

RNA Archive Protocol Conditions

Conditions	Description	Accepted Values
Protocol Name	A unique name for a specific RNA Archive protocol	♦ A unique combination of letters, numbers, and spaces ♦ Up to 32 characters
Transfer Conditions		
Lysis/DNA Precipitation Input	The kind of input plate to use	♦ Falcon 96-well plate ♦ Costar 3596 plate ♦ Nunc 168055 plate ♦ Deep-well plate

RNA Archive Protocol Conditions *(continued)*

<table>
<tr><th colspan="2">Conditions</th><th>Description</th><th>Accepted Values</th></tr>
<tr><td>First Transfer:</td><td>Transfer (µL)</td><td>The volume to transfer from the input plate to the purification tray</td><td>
<table>
<tr><th>Input Plate</th><th>Accepted Values</th></tr>
<tr><td>♦ Falcon 96-well plate
♦ Costar 3596 plate
♦ Nunc 168055 plate</td><td>5 to 250 µL</td></tr>
<tr><td>Deep-well plate</td><td>5 to 700 µL</td></tr>
</table>
IMPORTANT You must leave behind ≥50 µL in the lysis input plate. To transfer more cells, enter Second Transfer conditions.
</td></tr>
<tr><td></td><td>Mix (#)</td><td>The number of times to mix the lysed cells by pipetting up and down before aspirating</td><td>0 to 9 times</td></tr>
<tr><td rowspan="3">Second Transfer:

Note Specify Second Transfer conditions to maximize transfer of lysed cells to the purification tray.</td><td>Add Soln. (µL)</td><td>The volume of solution to add to the input plate before transferring to the purification tray

Note Adding solution to the input plate permits the robotic arm to access more of the sample.</td><td>≤ First Transfer: Transfer volume</td></tr>
<tr><td>Transfer (µL)</td><td>The volume to transfer from the input plate to the purification tray.</td><td>≤ Second Transfer: Add Soln. volume

IMPORTANT You must leave behind ≥50 µL in the lysis input plate.</td></tr>
<tr><td>Mix (#)</td><td>The number of times to mix the lysed cells by pipetting up and down before aspirating</td><td>0 to 9 times</td></tr>
<tr><td colspan="2">High Viscosity Sample</td><td>Whether or not to decrease the rate of aspirating and dispensing samples by the robotic arm tips</td><td>♦ Checked
♦ Unchecked

Note Check the box when the sample is viscous, e.g., when using crushed tissue samples.</td></tr>
<tr><td colspan="4">Filtration Conditions</td></tr>
<tr><td colspan="2">Create Deep-Well Filtrate Plate</td><td>Whether or not to collect the first filtrate for a subsequent protocol</td><td>♦ Checked
♦ Unchecked</td></tr>
<tr><td colspan="2">Incubation Time (min.)</td><td>The length of time to capture samples on the purification tray before applying vacuum pressure</td><td>0 to 99 minutes</td></tr>
<tr><td colspan="2">Vacuum Time (sec.)</td><td>The length of time to apply vacuum pressure</td><td>0 to 999 seconds</td></tr>
<tr><td colspan="2">Vacuum Pressure %</td><td>The level of vacuum pressure to apply during transfer of samples to the purification tray</td><td>10 to 100%, in 10% increments</td></tr>
</table>

RNA Archive Protocol Conditions *(continued)*

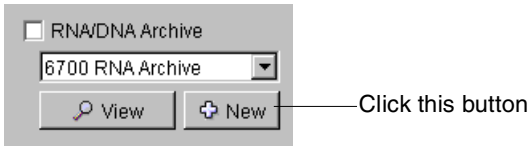
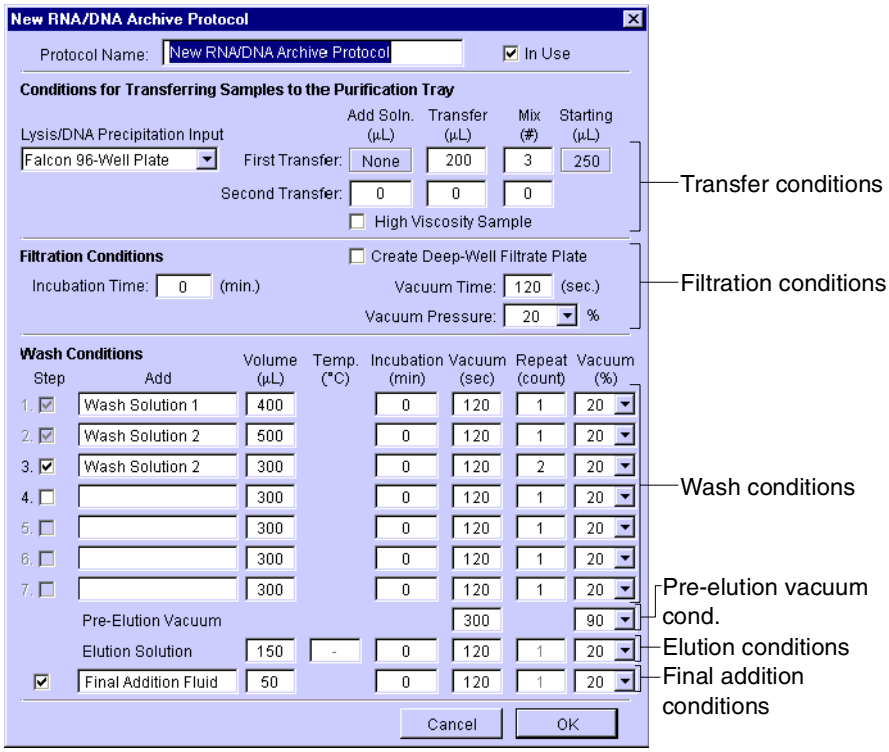
Conditions		Description	Accepted Values
Wash Conditions			
Step		The number of wash steps to include **Note** At least one wash step is required to pre-wet the purification tray before elution.	1 to 7 contiguous steps
Add		For each wash step, the name of the wash solution to add over the purification tray	Up to 32 characters
Volume (µL)		For each wash step, the volume of wash solution to add over the purification tray	40 to 650 µL
Incubation (min)		For each wash step, the length of time to wash the samples on the purification tray before applying vacuum pressure	0 to 99 minutes
Vacuum (sec)		For each wash step, the length of time to apply vacuum pressure	0 to 999 seconds
Repeat (count)		For each wash step, the number of times to repeat the step	1 to 9
Vacuum (%)		For each wash step, the amount of vacuum pressure to apply	10 to 100%, in 10% increments
Pre-Elution Vacuum Conditions			
Pre-Elution Vacuum	**Vacuum (sec)**	The length of time to apply vacuum pressure before elution	1 to 999 seconds
	Vacuum (%)	The amount of vacuum pressure to apply before elution	10 to 100%, in 10% increments
Elution Conditions			
Elution Solution	**Volume (µL)**	The volume of elution solution to add over the purification tray	40 to 200 µL **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
	Incubation (min)	The length of time to incubate the elution solution and samples on the purification tray before applying vacuum pressure	0 to 99 minutes
	Vacuum (sec)	The length of time to apply vacuum pressure during elution	1 to 999 seconds
	Vacuum (%)	The amount of vacuum pressure to apply to the purification tray during elution	10 to 100%, in 10% increments

RNA Archive Protocol Conditions *(continued)*

Conditions		Description	Accepted Values
Final Addition Fluid **Note** This is an optional step.	**Volume (µL)**	The volume of final addition fluid to add over the purification tray	5 to 200 µL **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
	Incubation (min)	The length of time to incubate the final addition fluid and samples on the purification tray before applying vacuum pressure	0 to 99 minutes
	Vacuum (sec)	The length of time to apply vacuum pressure	1 to 999 seconds
	Vacuum (%)	The amount of vacuum pressure to apply to the purification tray	10 to 100%, in 10% increments

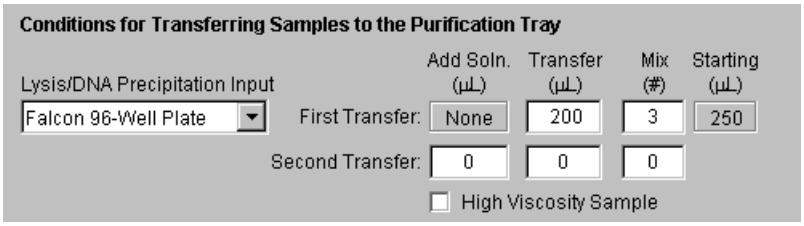
Creating RNA Archive Protocols

To create RNA Archive protocols:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **RNA/DNA Archive** protocol.  The **New RNA/DNA Archive Protocol** dialog box appears. 
3	Enter a **Protocol Name**.

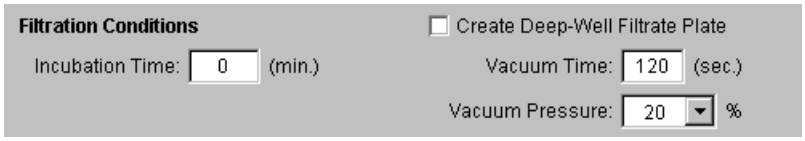
Defining Transfer Conditions

To define transfer conditions:

Step	Action
1	Select the plate that will be used from the **Lysis/DNA Precipitation Input** pop-up menu. 
2	Enter the **First Transfer** conditions: a. In the **Transfer (µL)** field, enter the amount of lysed cells to add to the purification tray. <table><tr><th>Input Plate</th><th>Accepted Value (µL)</th></tr><tr><td>♦ Falcon 96-well plate ♦ Costar 3596 plate ♦ Nunc 168055 plate</td><td>5 to 250</td></tr><tr><td>Deep-well plate</td><td>5 to 700</td></tr></table>**IMPORTANT** You must leave behind ≥50 µL in the input plate. To transfer more cells, enter the **Second Transfer** conditions using step 3. b. In the **Mix (#)** field, enter a value from 0 to 9 for the number of times to mix before aspirating samples.
3	To transfer more lysed cells, enter the **Second Transfer** conditions: a. In the **Add Soln. (µL)** field, enter a volume ≤ **First Transfer: Transfer** volume for the amount of solution to add to the input plate. b. In the **Transfer (µL)** field, enter a volume ≤ **Second Transfer: Add Soln.** volume for the amount of lysed cells-solution mixture to add to the purification tray. **IMPORTANT** You must leave behind ≥50 µL in the input plate. c. In the **Mix (#)** field, enter a value from 0 to 9 for the number of times to mix before aspirating samples.
4	To decrease the rate of aspiration for high-viscosity samples (*e.g.*, crushed tissue samples), check the **High-Viscosity Sample** box.

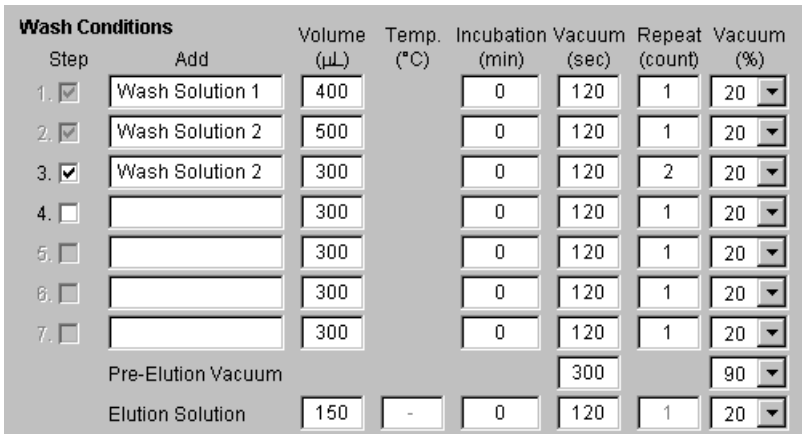
Defining Filtration Conditions

To define filtration conditions:

Step	Action
1	To save the filtrate, check the **Create Deep-Well Filtrate Plate** box. **Note** When this box is checked, the 6700 instrument saves the filtrate that flows through the purification tray from sample transfer(s). 
2	In the **Incubation Time (min.)** field, enter a value from 0 to 99 (minutes) for the length of time to capture samples on the purification tray before applying vacuum pressure.
3	Enter a value from 0 to 999 (seconds) in the **Vacuum Time (sec.)** field.
4	Select the **Vacuum Pressure %** from the pop-up menu. Select the vacuum pressure based on sample viscosity: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%) high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%)

Defining Wash Conditions

To define wash conditions:

Step	Action
1	Check up to 7 boxes in the **Step** column for each wash step to perform. **Note** At least one wash step is required to pre-wet the purification tray before elution. 
2	In the **Add** field for each wash step, enter the name of the wash solution to add.
3	In the **Volume (µL)** field for each wash step, enter a volume from 40 to 650 (µL) for the volume of wash solution to add over the purification tray.

To define wash conditions: *(continued)*

Step	Action
4	In the **Incubation (min)** field for each wash step, enter a value from 0 to 99 (minutes) for the length of time to wash the samples on the purification tray before applying vacuum pressure.
5	In the **Vacuum (sec)** field for each wash step, enter a value from 0 to 999 (seconds) for the length of time to apply vacuum pressure.
6	In the **Repeat (count)** field for each wash step, enter a value from 1 to 9 for the number of times to repeat the wash step.
7	Select the vacuum pressure for each wash step from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).

Defining Pre-Elution Vacuum Conditions

To define pre-elution vacuum conditions:

Step	Action
1	In the **Vacuum (sec)** field, enter a value from 1 to 999 (seconds) for the length of time to apply vacuum pressure before performing elution.
2	Select the vacuum pressure from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).

Defining Elution Conditions

To define elution conditions:

Step	Action
1	In the **Volume (µL)** field, enter a volume from 40 to 200 (µL) for the volume of elution solution to add over the purification tray. **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
2	In the **Incubation (min)** field, enter a value from 0 to 99 (minutes) for the length of time to incubate the elution solution and samples on the purification tray before applying vacuum pressure.
3	In the **Vacuum (sec)** field, enter a value from 1 to 999 (seconds) for the length of time to apply vacuum pressure during elution.
4	Select the vacuum pressure from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).

To define elution conditions: *(continued)*

Step	Action
5	Click **OK** to save this protocol and to return to the **Protocol** tab.

Defining Final Addition Fluid Conditions

Note This is an optional step.

To define final addition fluid conditions:

Step	Action
1	If you would like to add a final addition fluid, check the **Final Addition Fluid** checkbox and, if desired, type the name of the fluid in the text field (replacing **Final Addition Fluid**). **Note** This is often a second elution step, in which more elution solution is added. However, you may add a different fluid per your specific chemistry requirements.
2	In the **Volume (µL)** field, enter a volume from 5 to 200 (µL) for the volume of elution solution to add over the purification tray. **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
3	In the **Incubation (min)** field, enter a value from 0 to 99 (minutes) for the length of time to incubate the final addition fluid and samples on the purification tray before applying vacuum pressure.
4	In the **Vacuum (sec)** field, enter a value from 1 to 999 (seconds) for the length of time to apply vacuum pressure.
5	Select the vacuum pressure from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).
6	Click **OK** to save this protocol and to return to the **Protocol** tab.

Section: DNA Archive Protocols

In This Section The following topics are in this section:

Topic	See Page
DNA Archive Protocol Overview	4-31
DNA Archive Protocol Creation	4-33

DNA Archive Protocol Overview

Description During a DNA Archive protocol, the 6700 workstation purifies DNA from DNA precipitate.

DNA Archive Process The table below describes how the 6700 workstation performs a DNA Archive protocol.

DNA Archive Process

Stage	Description
1	The 6700 instrument transfers DNA precipitate to a purification tray, which contains a filter in each well.
2	The 6700 instrument applies vacuum pressure to the purification tray: a. The filter captures the DNA. b. Cellular debris flows through the filter. **Note** You can save the filtrate from this step for use in a subsequent protocol.
3	The 6700 instrument washes the filter-bound DNA.
4	The 6700 instrument elutes the DNA: a. The instrument adds elution solution to release the DNA from the filter. b. The instrument applies vacuum pressure to the purification tray. c. The purified DNA elutes into a DNA archive plate at the Archive Cover station.
5	If specified, the 6700 instrument adds a final addition fluid: a. The instrument adds a final addition fluid, as specified by the user. b. The instrument applies vacuum pressure to the purification tray. c. The purified RNA elutes into the RNA archive plate at the vacuum station.
6	If specified, the 6700 instrument covers the DNA archive plate with an archive cover.

Output Applications

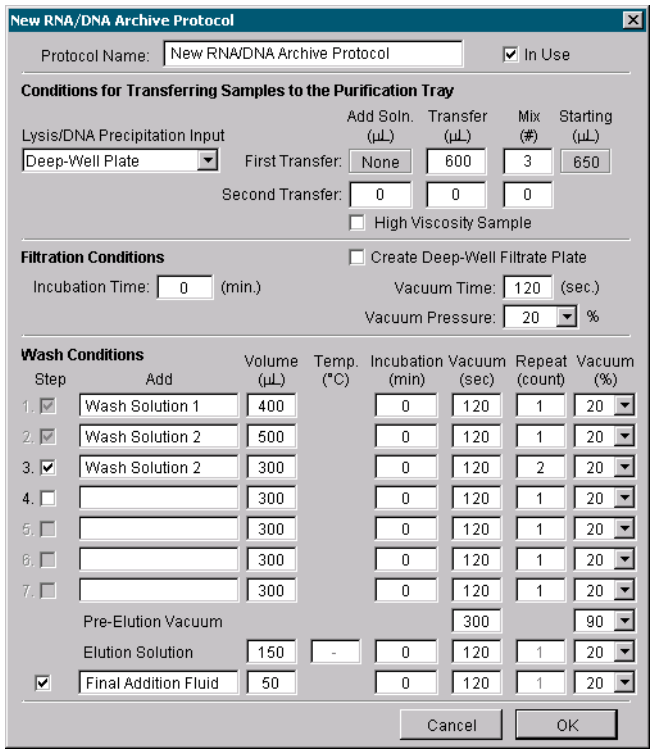
DNA archive output can be used for:

- Dilution Archive protocols
- Assay protocols
- Southern blots, cloning, and sequencing
- Long-term storage at –80 °C

DNA Archive Protocol Creation

DNA Archive Conditions

When you create a new DNA Archive protocol, you define the conditions displayed in the New RNA/DNA Archive Protocol dialog box, as shown below.



These conditions are described in the table below.

DNA Archive Protocol Conditions

Conditions	Description	Accepted Values
Protocol Name	A unique name for a specific DNA Archive protocol	♦ A unique combination of letters, numbers, and spaces ♦ Up to 32 characters
Transfer Conditions		
Lysis/DNA Precipitation Input	The kind of input plate to use	♦ Falcon 96-well plate ♦ Costar 3596 plate ♦ Nunc 168055 plate ♦ Deep-well plate

DNA Archive Protocol Conditions *(continued)*

<table>
<tr><th colspan="2">Conditions</th><th>Description</th><th>Accepted Values</th></tr>
<tr><td>First Transfer:</td><td>Transfer (µL)</td><td>The volume to transfer from the input plate to the purification tray</td><td>
<table>
<tr><th>Input Plate</th><th>Accepted Values</th></tr>
<tr><td>♦ Falcon
♦ Costar
♦ Nunc</td><td>5 to 250 µL</td></tr>
<tr><td>Deep-well plate</td><td>5 to 700 µL</td></tr>
</table>
IMPORTANT You must leave behind ≥50 µL in the lysis input plate. To transfer more cells, enter Second Transfer conditions.
</td></tr>
<tr><td></td><td>Mix (#)</td><td>The number of times to mix the lysed cells by pipetting up and down before aspirating</td><td>0 to 9 times</td></tr>
<tr><td rowspan="3">Second Transfer:

Note Specify Second Transfer conditions to maximize transfer of lysed cells to the purification tray.</td><td>Add Soln. (µL)</td><td>The volume of solution to add to the input plate before transferring to the purification tray

Note Addition of solution to the input plate permits the robotic arm to access more of the sample.</td><td>≤ First Transfer: Transfer volume</td></tr>
<tr><td>Transfer (µL)</td><td>The volume to transfer from the input plate to the purification tray.</td><td>≤ Second Transfer: Add Soln. volume

IMPORTANT You must leave behind ≥50 µL in the lysis input plate</td></tr>
<tr><td>Mix (#)</td><td>The number of times to mix the lysed cells by pipetting up and down before aspirating</td><td>0 to 9 times</td></tr>
<tr><td colspan="2">High Viscosity Sample</td><td>Whether or not to decrease the rate of aspirating and dispensing samples by the robotic arm tips</td><td>♦ Checked
♦ Unchecked

Note Check the box when the sample is viscous, e.g., when using crushed tissue samples or chromosomal DNA.</td></tr>
<tr><td colspan="4">Filtration Conditions</td></tr>
<tr><td colspan="2">Create Deep-Well Filtrate Plate</td><td>Whether or not to collect the first filtrate for a subsequent protocol</td><td>♦ Checked
♦ Unchecked</td></tr>
<tr><td colspan="2">Incubation Time (min.)</td><td>The length of time to capture samples on the purification tray before applying vacuum pressure</td><td>0 to 99 minutes</td></tr>
<tr><td colspan="2">Vacuum Time (sec.)</td><td>The length of time to apply vacuum pressure</td><td>0 to 999 seconds</td></tr>
<tr><td colspan="2">Vacuum Pressure %</td><td>The level of vacuum pressure to apply during transfer of samples to the purification tray</td><td>10 to 100%, in 10% increments</td></tr>
</table>

DNA Archive Protocol Conditions *(continued)*

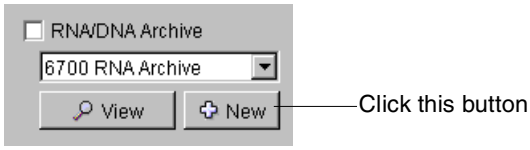
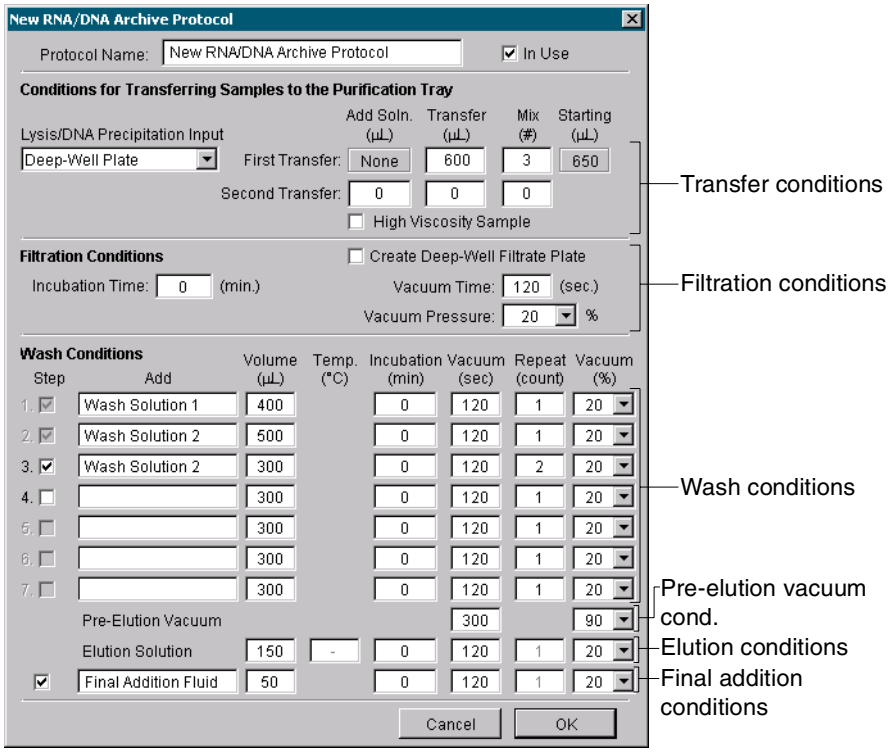
Conditions		Description	Accepted Values
Wash Conditions			
Step		The number of wash steps to include **Note** At least one wash step is required to pre-wet the purification tray before elution.	1 to 7 contiguous steps
Add		For each wash step, the name of the Wash Solution to add over the purification tray	Up to 32 characters
Volume (µL)		For each wash step, the volume of Wash Solution to add over the purification tray	40 to 650 µL
Incubation (min)		For each wash step, the length of time to wash the samples on the purification tray before applying vacuum pressure	0 to 99 minutes
Vacuum (sec)		For each wash step, the length of time to apply vacuum pressure	0 to 999 seconds
Repeat (count)		For each wash step, the number of times to repeat the step	1 to 9
Vacuum (%)		For each wash step, the amount of vacuum pressure to apply	10 to 100%, in 10% increments
Pre-Elution Vacuum Conditions			
Pre-Elution Vacuum	**Vacuum (sec)**	The length of time to apply vacuum pressure before elution	1 to 999 seconds
	Vacuum (%)	The amount of vacuum pressure to apply before elution	10 to 100%, in 10% increments
Elution Conditions			
Elution Solution	**Volume (µL)**	The volume of elution solution to add over the purification tray	40 to 200 µL **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
	Incubation (min)	The length of time to incubate the elution solution and samples on the purification tray before applying vacuum pressure	0 to 99 minutes
	Vacuum (sec)	The length of time to apply vacuum pressure during elution	1 to 999 seconds
	Vacuum (%)	The amount of vacuum pressure to apply to the purification tray during elution	10 to 100%, in 10% increments

DNA Archive Protocol Conditions *(continued)*

Conditions		Description	Accepted Values
Final Addition Fluid **Note** This is an optional step.	**Volume (µL)**	The volume of final addition fluid to add over the purification tray	5 to 200 µL **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
	Incubation (min)	The length of time to incubate the final addition fluid and samples on the purification tray before applying vacuum pressure	0 to 99 minutes
	Vacuum (sec)	The length of time to apply vacuum pressure	1 to 999 seconds
	Vacuum (%)	The amount of vacuum pressure to apply to the purification tray	10 to 100%, in 10% increments

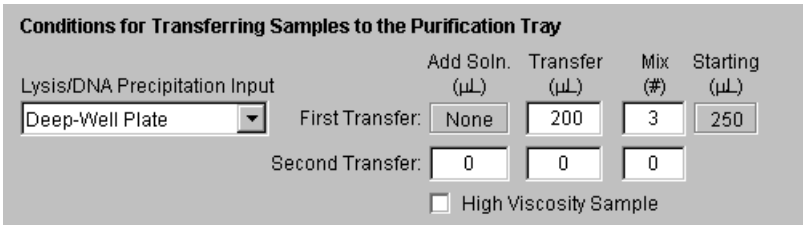
Creating DNA Archive Protocols

To create DNA Archive protocols:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **RNA/DNA Archive** protocol.  The **New RNA/DNA Archive Protocol** dialog box appears. 
3	Enter a **Protocol Name**.

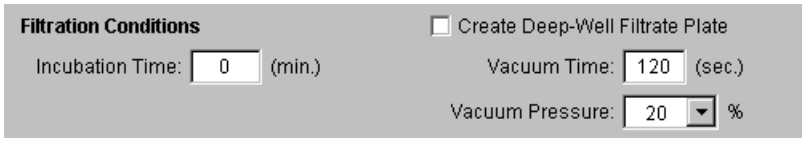
Defining Transfer Conditions

To define transfer conditions:

Step	Action
1	Select the plate that will be used from the **Lysis/DNA Precipitation Input** pop-up menu. 
2	Enter the **First Transfer** conditions: a. In the **Transfer (µL)** field, enter the amount of lysed cells to add to the purification tray. <table><tr><th>Input Plate</th><th>Accepted Values (µL)</th></tr><tr><td>♦ Falcon 96-well plate ♦ Costar 3596 plate ♦ Nunc 168055 plate</td><td>5 to 250</td></tr><tr><td>Deep-well plate</td><td>5 to 700</td></tr></table>**IMPORTANT** You must leave behind ≥50 µL in the input plate. To transfer more cells, enter the **Second Transfer** conditions using step 3. b. In the **Mix (#)** field, enter a value from 0 to 9 for the number of times to mix before aspirating samples.
3	To transfer more lysed cells, enter the **Second Transfer** conditions: a. In the **Add Soln. (µL)** field, enter a volume ≤ **First Transfer: Transfer** volume for the amount of solution to add to the input plate. b. In the **Transfer (µL)** field, enter a volume ≤ **Second Transfer: Add Soln.** volume for the amount of lysed cells-solution mixture to add to the purification tray. **IMPORTANT** You must leave behind ≥50 µL in the input plate. c. In the **Mix (#)** field, enter a value from 0 to 9 for the number of times to mix before aspirating samples.
4	To decrease the rate of aspiration for high-viscosity samples (*e.g.*, crushed tissue samples or chromosomal DNA), check the **High-Viscosity Sample** box.

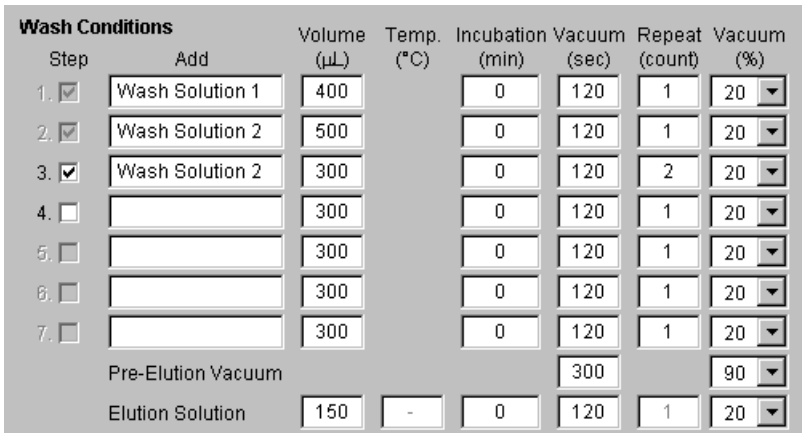
Defining Filtration Conditions

To define filtration conditions:

Step	Action
1	To save the filtrate, check the **Create Deep-Well Filtrate Plate** box. **Note** When this box is checked, the 6700 instrument saves the filtrate that flows through the purification tray from sample transfer(s). 
2	In the **Incubation Time (min.)** field, enter a value from 0 to 99 (minutes) for the length of time to capture samples on the purification tray before applying vacuum pressure.
3	Enter a value from 0 to 999 (seconds) in the **Vacuum Time (sec.)** field.
4	Select the **Vacuum Pressure %** from the pop-up menu. Select the vacuum pressure based on sample viscosity: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).

Defining Wash Conditions

To define wash conditions:

Step	Action
1	Check up to 7 boxes in the **Step** column for each wash step to perform. **Note** At least one wash step is required to pre-wet the purification tray before elution. 
2	In the **Add** field for each wash step, enter the name of the wash solution to add.
3	In the **Volume (µL)** field for each wash step, enter a volume from 40 to 650 (µL) for the volume of wash solution to add over the purification tray.

To define wash conditions: *(continued)*

Step	Action
4	In the **Incubation (min)** field for each wash step, enter a value from 0 to 99 (minutes) for the length of time to wash the samples on the purification tray before applying vacuum pressure.
5	In the **Vacuum (sec)** field for each wash step, enter a value from 0 to 999 (seconds) for the length of time to apply vacuum pressure.
6	In the **Repeat (count)** field for each wash step, enter a value from 1 to 9 for the number of times to repeat the wash step.
7	Select the vacuum pressure for each wash step from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).

Defining Pre-Elution Vacuum Conditions

To define pre-elution vacuum conditions:

Step	Action
1	In the **Vacuum (sec)** field, enter a value from 1 to 999 (seconds) for the length of time to apply vacuum pressure before performing elution.
2	Select the vacuum pressure from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).

Defining Elution Conditions

To define elution conditions:

Step	Action
1	In the **Volume (µL)** field, enter a volume from 40 to 200 (µL) for the volume of elution solution to add over the purification tray. **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
2	In the **Incubation (min)** field, enter a value from 0 to 99 (minutes) for the length of time to incubate the elution solution and samples on the purification tray before applying vacuum pressure.
3	In the **Vacuum (sec)** field, enter a value from 1 to 999 (seconds) for the length of time to apply vacuum pressure during elution.
4	Select the vacuum pressure from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).

To define elution conditions: *(continued)*

Step	Action
5	Click **OK** to save this protocol and to return to the **Protocol** tab.

Defining Final Addition Fluid Conditions

Note This is an optional step.

To define final addition fluid conditions:

Step	Action
1	If you would like to add a final addition fluid, check the **Final Addition Fluid** checkbox and, if desired, type the name of the fluid in the text field (replacing **Final Addition Fluid**). **Note** This is often a second elution step, in which more elution solution is added. However, you may add a different fluid per your specific chemistry requirements.
2	In the **Volume (µL)** field, enter a volume from 5 to 200 (µL) for the volume of elution solution to add over the purification tray. **Note** The sum of the **Elution Solution** and **Final Addition Fluid** must be ≤200 µL.
3	In the **Incubation (min)** field, enter a value from 0 to 99 (minutes) for the length of time to incubate the final addition fluid and samples on the purification tray before applying vacuum pressure.
4	In the **Vacuum (sec)** field, enter a value from 1 to 999 (seconds) for the length of time to apply vacuum pressure.
5	Select the vacuum pressure from the **Vacuum (%)** pop-up menu: **If sample viscosity is...** → **Then select...** low (similar to the consistency of water) → a lower vacuum pressure (*e.g.*, from 20% to 50%). high (similar to the consistency of glycerol) → a higher vacuum pressure (*e.g.*, from 50% to 90%).
6	Click **OK** to save this protocol and to return to the **Protocol** tab.

Section: cDNA Archive Protocols

In This Section This section covers the following topics:

Topic	See Page
cDNA Archive Protocol Overview	4-43
cDNA Archive Protocol Creation	4-44

cDNA Archive Protocol Overview

Description During a cDNA Archive protocol, the 6700 workstation transfers RNA and reverse transcription (RT) master mix to a cDNA archive plate and heats the plate to reverse transcribe cDNA from RNA.

cDNA Archive Process The table below describes how the 6700 workstation performs a cDNA Archive protocol.

cDNA Archive Process

Stage	Description
1	The 6700 instrument transfers RNA from the input plate to the cDNA archive plate.
2	The 6700 instrument adds RT master mix to the cDNA archive plate.
3	The 6700 instrument's robotic arm places an archive cover on the cDNA archive plate.
4	The 6700 instrument heats the cDNA archive plate to perform RT.
5	After completing the cDNA Archive protocol, the instrument cools the Dilutions/cDNA station to 4 °C.

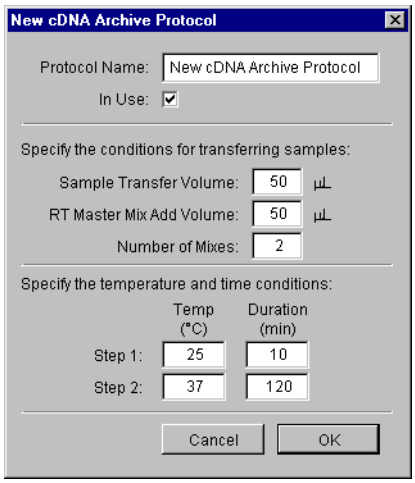
Output Applications cDNA archive output can be used for:

- Dilution Archive protocols
- Assay protocols
- cDNA cloning
- Long-term storage at –80 °C

cDNA Archive Protocol Creation

cDNA Archive Conditions

When you create a new cDNA Archive protocol, you define the conditions displayed in the New cDNA Archive Protocol dialog box, as shown below.



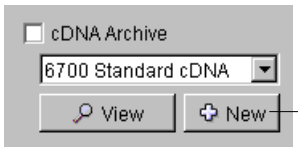
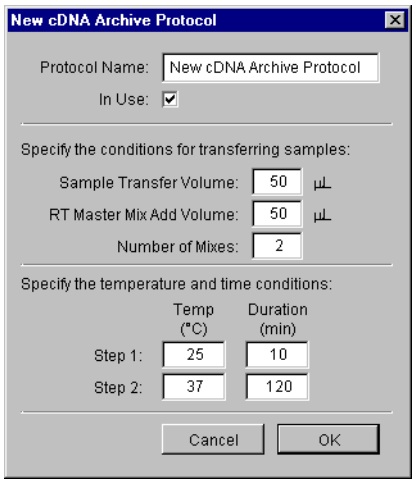
These conditions are described in the table below.

cDNA Archive Protocol Conditions

Condition		Description	Accepted Values
Protocol Name		A unique name for a specific cDNA Archive protocol	♦ A unique combination of numbers, letters, and spaces ♦ Up to 32 characters
Sample Transfer Volume		The volume of sample to transfer to the cDNA archive plate	5 to 145 µL **Note** The sum of the **Sample Transfer Volume** and **RT Master Mix Add Volume** must be ≤150 µL.
RT Master Mix Add Volume		The volume of RT master mix to transfer to the cDNA archive plate	5 to 145 µL **Note** The sum of the **Sample Transfer Volume** and **RT Master Mix Add Volume** must be ≤150 µL.
Number of Mixes		The number of times to mix sample and master mix by pipetting up and down	0 to 9 times
Step 1:	**Temp (°C)**	The temperature of the cDNA archive plate for **Step 1**	4 to 50 °C
	Duration (min)	The length of time to incubate the cDNA archive plate for **Step 1**	1 to 180 minutes
Step 2:	**Temp (°C)**	The temperature of the cDNA archive plate for **Step 2**	4 to 50 °C
	Duration (min)	The length of time to incubate the cDNA archive plate for **Step 2**	0 to 180 minutes

Creating cDNA Archive Protocols

To create cDNA Archive protocols:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **cDNA Archive** protocol.  The **New cDNA Archive Protocol** dialog box appears. 
3	Enter a **Protocol Name**.

Defining cDNA Archive Conditions

To define cDNA archive conditions:

Step	Action
1	In the **Sample Transfer Volume** field, enter a value from 5 to 145 (µL) for the volume of sample to transfer to the cDNA archive plate. **Note** The sum of the **Sample Transfer Volume** and **RT Master Mix Add Volume** must be ≤150 µL.
2	In the **RT Master Mix Add Volume** field, enter a value from 5 to 145 (µL) for the volume of RT master mix to add to the cDNA archive plate. **Note** The sum of the **Sample Transfer Volume** and **RT Master Mix Add Volume** must be ≤150 µL.
3	In the **Number of Mixes** field, enter a value from 0 to 9 for the number of times to mix sample and master mix by pipetting up and down.
4	Specify temperature and duration conditions for **Step 1**: a. In the **Temp (°C)** field, enter a value from 4 to 50 (°C) for the temperature of the cDNA archive plate. b. In the **Duration (min)** field, enter a value from 1 to 180 (minutes) for the length of time to incubate the cDNA archive plate for Step 1.

To define cDNA archive conditions: *(continued)*

Step	Action
5	Specify temperature and duration conditions for **Step 2**: a. In the **Temp (°C)** field, enter a value from 4 to 50 (°C) for the temperature of the cDNA archive plate. b. In the **Duration (min)** field, enter a value from 0 to 180 (minutes) for the length of time to incubate the cDNA archive plate for Step 2.
6	Click **OK** to save this protocol and to return to the **Protocol** tab.

Section: Dilution Archive Protocols

In This Section

This section covers the following topics:

Topic	See Page
Dilution Archive Protocol Overview	4-47
Dilution Archive Protocol Creation	4-48

Dilution Archive Protocol Overview

Description

During a Dilution Archive protocol, the 6700 workstation performs up to two serial dilutions of an RNA archive, DNA archive, or cDNA archive plate.

Dilution Archive Process

The table below describes how the 6700 workstation performs a Dilution Archive protocol.

Dilution Archive Process

Stage	Description
1	The 6700 instrument adds diluent (dilution solution) to dilution archive plate 1.
2	The 6700 instrument transfers the amount of RNA, DNA, or cDNA to be diluted to dilution archive plate 1.
3	The 6700 instrument mixes the sample and diluent in dilution archive plate 1.
4	If a serial dilution is specified in the Dilution Archive protocol, the 6700 instrument adds diluent (dilution solution) to dilution archive plate 2.
5	If specified, the 6700 instrument transfers diluted sample from dilution archive plate 1 into dilution archive plate 2.
6	The 6700 instrument mixes the sample and diluent in dilution archive plate 2.
7	If specified, the 6700 instrument covers the dilution archive plates with archive covers.

Output Applications

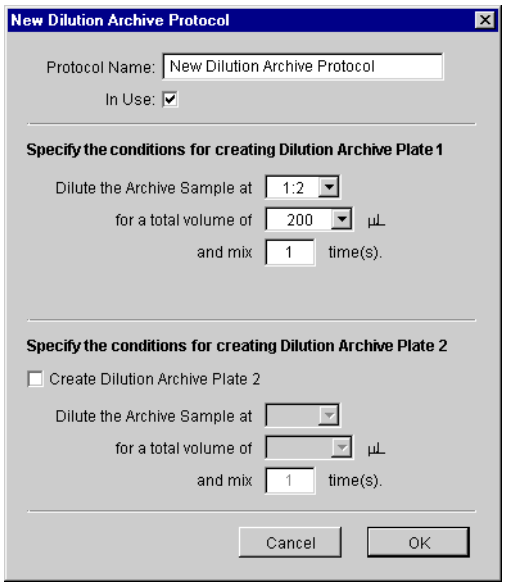
Dilution archive output can be used for:

- RNA Archive protocol output applications (see page 4-20)
- DNA Archive protocol output applications (see page 4-32)
- cDNA Archive protocol output applications (see page 4-43)

Dilution Archive Protocol Creation

Dilution Archive Conditions

When you create a new Dilution Archive protocol, you define the conditions displayed in the New Dilution Archive Protocol dialog box, as shown below.



These conditions are described in the table below.

Dilution Archive Protocol Conditions

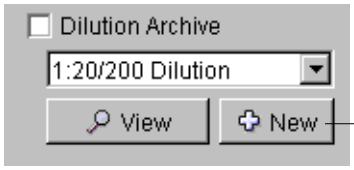
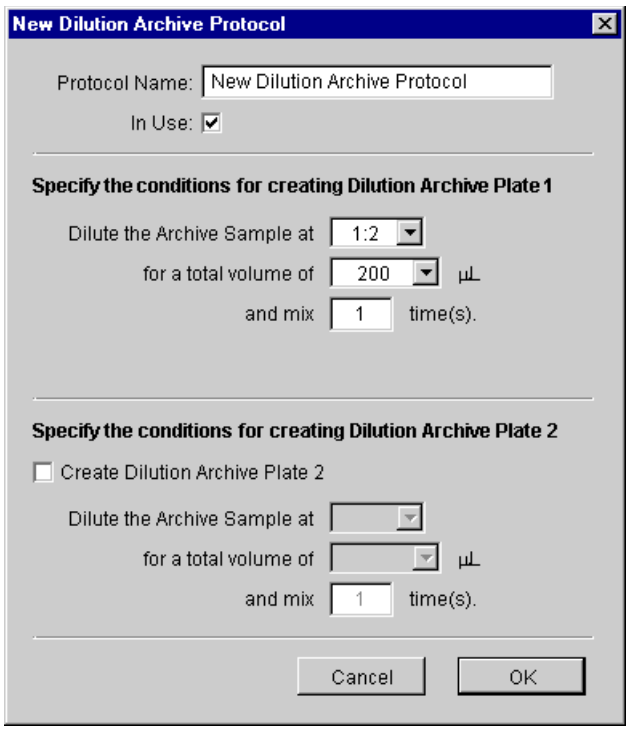
Condition	Description	Accepted Values
Protocol Name	A unique name for a specific Dilution Archive protocol	♦ A unique combination of letters, numbers, and spaces ♦ Up to 32 characters
Dilution Archive Plate 1		
Dilute the Archive Sample at (dilution factor)	The ratio of input archive sample volume to total diluted volume	1:2 to 1:20
for a total volume of	The total volume of diluted material to prepare	Values in the pop-up menu vary according to the dilution factor for plate 1 ♦ Minimum value is 20 µL (1:2 dilution) ♦ Maximum value is 200 µL
and mix	The number of times to mix the diluent and sample by pipetting up and down	1 to 9
Dilution Archive Plate 2		
Create Dilution Archive Plate 2	Indicates whether or not to perform a second dilution	♦ Checked ♦ Unchecked
Dilute the Archive Sample at (dilution factor)	The ratio of input archive sample volume to total diluted volume **Note** This dilution factor indicates the final dilution factor of the input archive sample in dilution archive plate 2.	Values in the pop-up menu vary according to the dilution factor for plate 1

Dilution Archive Protocol Conditions *(continued)*

Condition	Description	Accepted Values
for a total volume of	The total volume of diluted material to prepare	Values in the pop-up menu vary according to the dilution factor for plate 2 ♦ Minimum value is 20 µL ♦ Maximum value is 200 µL
and mix	The number of times to mix the diluent and sample by pipetting up and down	1 to 9

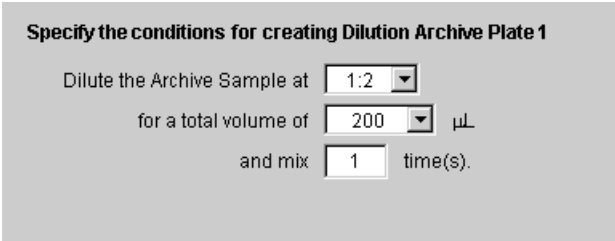
Creating Dilution Archive Protocols

To create Dilution Archive protocols:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **Dilution Archive** protocol.  The **New Dilution Archive Protocol** dialog box appears. 
3	Enter a **Protocol Name**.

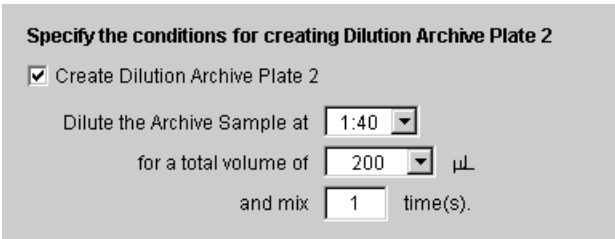
Defining Dilution Archive Plate 1 Conditions

To define dilution archive plate 1 conditions:

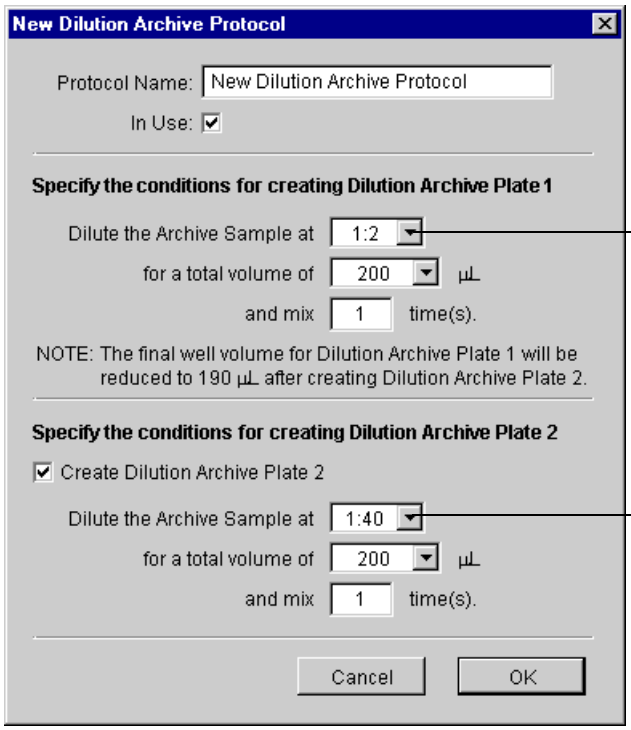
Step	Action
1	Select a dilution factor from the **Dilute the Archive Sample at** pop-up menu. 
2	Select the volume of diluted material to prepare from the **for a total volume of** pop-up menu.
3	In the **and mix** field, enter a value from 1 to 9 for the number of times to mix diluent (*e.g.*, dilution solution) and sample by pipetting up and down.
4	**If this is...** / **Then...** the only dilution you require — click **OK** to save this protocol and to return to the **Protocol** tab. not the only dilution you require — continue with "Defining Dilution Archive Plate 2 Conditions" below.

Defining Dilution Archive Plate 2 Conditions

To define dilution archive plate 2 conditions:

Step	Action
1	Check the **Create Dilution Archive Plate 2** check box. 
2	Select a dilution factor from the **Dilute the Archive Sample at** pop-up menu. **Note** This dilution factor indicates the final dilution factor of the input archive sample in dilution archive plate 2.

To define dilution archive plate 2 conditions: *(continued)*

Step	Action
3	Select the volume of diluted material to prepare from the **for a total volume of** pop-up menu. **Note** The software calculates the final volume that will remain in dilution archive plate 1 and updates the dialog box with this value.  The input archive sample is diluted 1:2 in dilution archive plate 1 The input archive sample is diluted 1:40 in dilution archive plate 2
4	In the **and mix** field, enter a value from 1 to 9 for the number of times to mix diluent (*e.g.*, dilution solution) and sample by pipetting up and down.
5	Click **OK** to save this protocol and to return to the **Protocol** tab.

Section: Assay Protocols

In This Section

This section covers the following topics:

Topic	See Page
Assay Protocol Overview	4-53
Assay Protocol Setup	4-54
Assay Protocol Creation Overview	4-61
Assay Protocol Creation for 96-Well Output	4-70
Assay Protocol Creation for 384-Well Output	4-79

Assay Protocol Overview

Description

During an Assay protocol, the 6700 workstation prepares assay output plates: up to four 96-well optical plates or one 384-well optical plate. These output plates contain master mixes, standards, controls, and samples from an RNA archive, DNA archive, cDNA archive, or dilution archive plate.

Assay Protocol Process

The table below describes how the 6700 workstation performs an Assay protocol.

Assay Protocol Process

Stage	Description
1	The 6700 instrument transfers master mix to the output plates.
2	If specified, the 6700 instrument dilutes the samples into dilution archive plates.
3	The 6700 instrument transfers standards, controls, and samples to the output plates.
4	If specified, the heat sealer places optical heat-seal covers on the output plates.

Output Applications

Assay output can be used for a variety of applications:

- Standard Curve
- Comparative Quantification
- Allelic Discrimination
- Plus/Minus
- Custom

Assay Protocol Setup

Overview

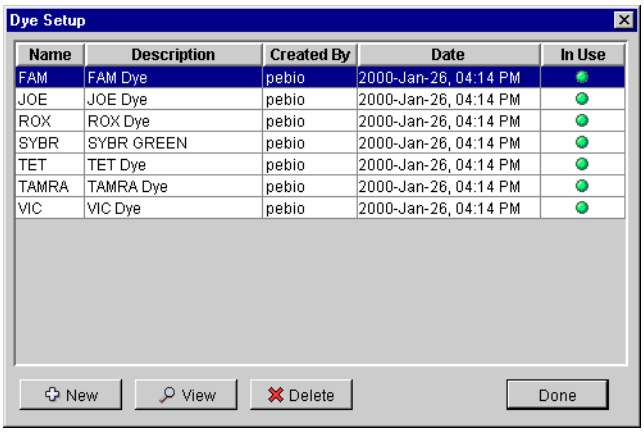
Before you create an Assay protocol, you need to set up the following in the 6700 database:

- Dyes
- Detectors
- Sample Types

Setting Up Dyes

Set up the dyes in the 6700 database before creating an Assay protocol.

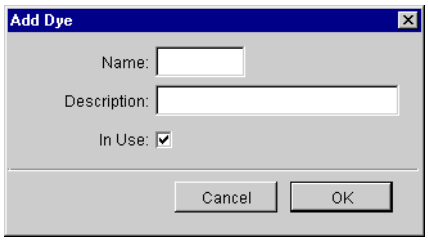
To set up dyes:

Step	Action
1	Determine the dyes used as reporters or quenchers in the detectors that your assay uses.
2	Go to the **Setup** menu of the 6700 software.
3	Select **Dyes**. The **Dye Setup** dialog box appears. 
4	View the list of dyes by **Name**.

If the dye is…	Then…
not listed	create a new dye to use in detectors for Assay protocols. See “Creating a New Dye” on page 4-55 to continue.
listed but not marked in the **In Use** column	change the **In Use** setting to view the dye when creating detectors. See “Changing the Dye’s In Use Setting” on page 4-55 to continue.
listed and marked in the **In Use** column	change the **In Use** setting to remove the dye from use in detectors. See “Deleting a Dye” on page 4-55 to continue.

Creating a New Dye

To create a new dye:

Step	Action
1	In the **Dye Setup** dialog box, click the **New** button. An **Add Dye** dialog box appears. 
2	Enter the **Name** of the dye and a **Description**.
3	Make sure that the **In Use** check box is checked.
4	Click **OK** to return to the **Dye Setup** dialog box, then click **Done**.

Changing the Dye's In Use Setting

To change the In Use setting:

Step	Action
1	In the **Dye Setup** dialog box, double-click the dye you want to reset. A **View Dye** dialog box appears.
2	Change the **In Use** check box by clicking it. **Note** You can change settings only for dyes you created.
3	Click **OK** to return to the **Dye Setup** dialog box, then click **Done**.

Deleting a Dye

To delete a dye:

Step	Action
1	In the **Dye Setup** dialog box, select the dye by clicking it once. The dye is highlighted.
2	Click the **Delete** button. **Note** To delete a dye, it must fulfill the following criteria: ♦ You created the dye. ♦ The dye is not used in any detectors in the 6700 database. **Note** Remove the dye from use if you do not want it to appear in the **Reporter** or **Quencher** pop-up menus in the **Add Detector** dialog box. See "Creating a New Detector" on page 4-57 for more information.

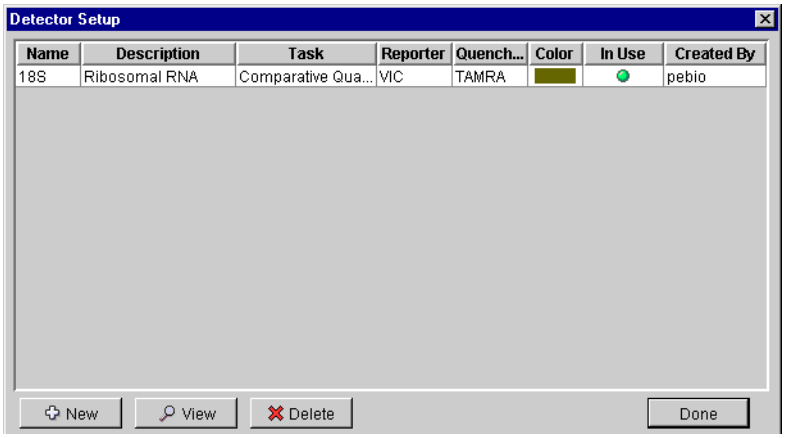
Setting Up Detectors

Set up detectors in the 6700 database before creating an Assay protocol.

To set up detectors:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Determine the detectors in the master mixes that your assay uses.</td></tr>
<tr><td>2</td><td>Go to the Setup menu of the 6700 software.</td></tr>
<tr><td>3</td><td>Select Detectors.

The Detector Setup dialog box appears.

 
</td></tr>
<tr><td>4</td><td>View the list of detectors by Name.

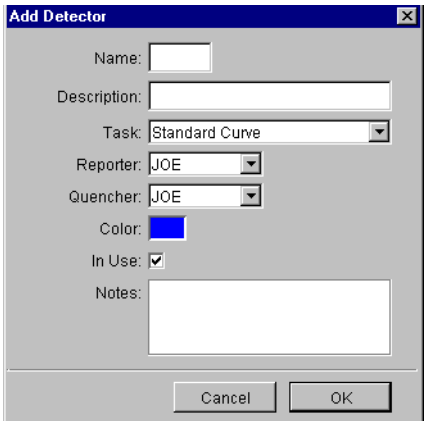
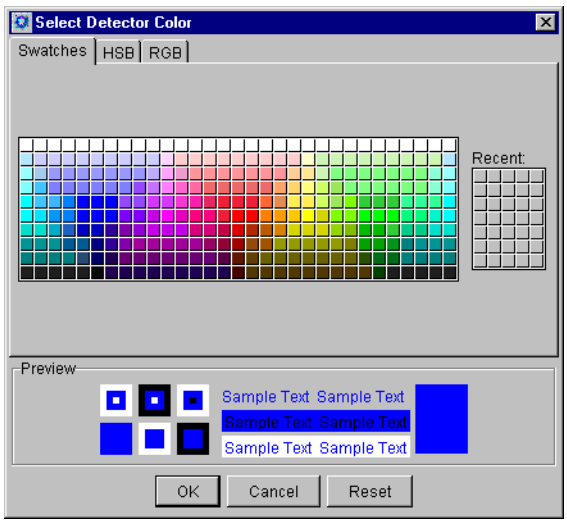
<table>
<tr><th>If the detector is…</th><th>Then…</th></tr>
<tr><td>not listed and you want to use the detector when creating Assay protocols</td><td>create a new detector. See “Creating a New Detector” on page 4-57 to continue.</td></tr>
<tr><td>listed but not marked in the In Use column and you want to use the detector when creating Assay protocols</td><td>change the In Use setting. See “Changing the Detector’s In Use Setting” on page 4-58 to continue.</td></tr>
<tr><td>listed and marked in the In Use column and you want to remove the detector from use in new Assay protocols,</td><td>♦ change the In Use setting. See “Changing the Detector’s In Use Setting” on page 4-58 to continue.

or

♦ Delete the detector. See “Deleting a Detector” on page 4-58 to continue.</td></tr>
</table>
</td></tr>
</table>

Creating a New Detector

To create a new detector:

Step	Action
1	In the **Detector Setup** dialog box, click the **New** button. The **Add Detector** dialog box appears. 
2	Enter the **Name** and **Description**.
3	Select the type of task this detector performs from the **Task** pop-up menu.
4	Select the reporter dye from the **Reporter** pop-up menu. **Note** If the reporter dye is not available, see “Setting Up Dyes” on page 4-54 to create a reporter dye or to mark an appropriate dye as **In Use**.
5	Select the quencher dye from the **Quencher** pop-up menu. **Note** If the quencher dye is not available, see “Setting Up Dyes” on page 4-54 to create a quencher dye or to mark an appropriate dye as **In Use**.
6	Set the color for the detector: a. Double-click the **Color** box. The **Select Detector Color** dialog box appears.  b. Set the colors using the **Swatches**, **HSB**, or **RGB** tabs. c. Click **OK**.

To create a new detector: *(continued)*

Step	Action
7	Make sure that the **In Use** check box is checked.
8	Click **OK** to return to the **Detector Setup** dialog box, then click **Done**.

Changing the Detector's In Use Setting

To change the In Use setting:

Step	Action
1	In the **Detector Setup** dialog box, double-click the detector that you want to reset. An **Edit Detector** dialog box appears.
2	Change the **In Use** check box by clicking it. **Note** You can change settings only for detectors you created.
3	Click **OK** to return to the **Detector Setup** dialog box, then click **Done**.

Deleting a Detector

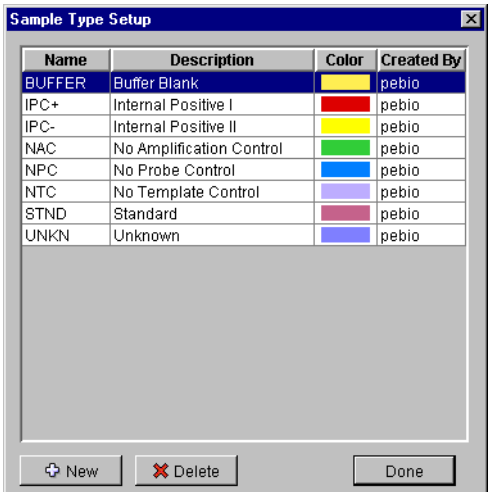
To delete a detector:

Step	Action
1	In the **Detector Setup** dialog box, select the detector by clicking it once.
2	Click the **Delete** button. **Note** To delete a detector, it must fulfill the following criteria: ♦ You created the detector. ♦ The detector is not used in any Assay protocols. **Note** Remove the detector from use if you do not want it to appear in the **Detector** pop-up menus when specifying master mixes for Assay protocols.

Setting Up Sample Types

Set up sample types in the 6700 database before creating a new Assay protocol.

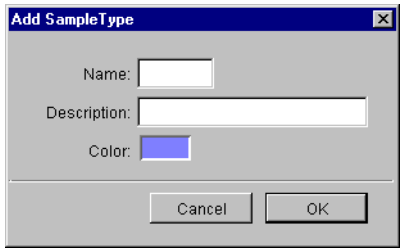
To set up sample types:

Step	Action
1	Determine the sample types for standards and controls that your assay uses.
2	Go to the **Setup** menu of the 6700 software.
3	Select **Sample Types**. The **Sample Type Setup** dialog box appears. 
4	View the list of sample types by **Name**.

If the sample type is…	Then…
not listed and you want to use the sample type when creating Assay protocols	create a new sample type. See “Creating a New Sample Type” on page 4-60 to continue.
listed and you want to remove the sample type from use in new Assay protocols,	delete the sample type. See “Deleting a Sample Type” on page 4-60 to continue.

Creating a New Sample Type

To create a new sample type:

1	In the **Sample Type Setup** dialog box, click the **New** button to add a new sample type to the 6700 database. The **Add Sample Type** dialog box appears. 
2	Enter a **Name** and a **Description**.
3	Set the color for this sample type: a. Double-click the **Color** box. The **Select Sample Type Color** dialog box appears. b. Set the colors using the **Swatches**, **HSB**, or **RGB** tabs. c. Click **OK**.
4	Click **OK** to return to the **Sample Type Setup** dialog box, then click **Done**.

Deleting a Sample Type

To delete a sample type:

1	In the **Sample Type Setup** dialog box, select a sample type by clicking it once.
2	Click the **Delete** button. **Note** To delete a sample type, it must fulfill the following criteria: ♦ You created the sample type. ♦ The sample type is not used in any Assay protocols in the 6700 database.

Assay Protocol Creation Overview

Assay Protocol Wizard

Defining the Assay protocol occurs through the Assay Protocol wizard.

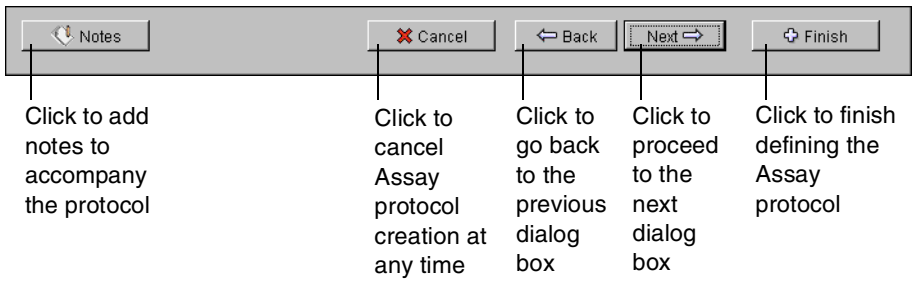
Assay Protocol Wizard Procedures

The Assay Protocol wizard takes you through the following procedures:

Topic	See Page
Assay Protocol Creation for 96-Well Output	4-70
Specifying the Master Mixes	4-71
Specifying Master Mix Detectors	4-72
Specifying Replicates for Master Mixes	4-73
Specifying Dilutions	4-74
Specifying Standards for Master Mixes	4-75
Specifying Standard Quantities	4-76
Specifying Controls for Master Mixes	4-77
Completing the Protocol	4-78
Assay Protocol Creation for 384-Well Output	4-79
Specifying the Master Mixes	4-80
Specifying Master Mix Detectors	4-81
Specifying Replicates for Master Mixes	4-82
Specifying Dilutions	4-83
Specifying Standards for Master Mixes	4-84
Specifying Standard Quantities	4-85
Specifying Controls for Master Mixes	4-86
Completing the Protocol	4-87

Assay Protocol Wizard Bar

The bar below is present on every Assay Protocol wizard dialog box when you create a new Assay protocol.

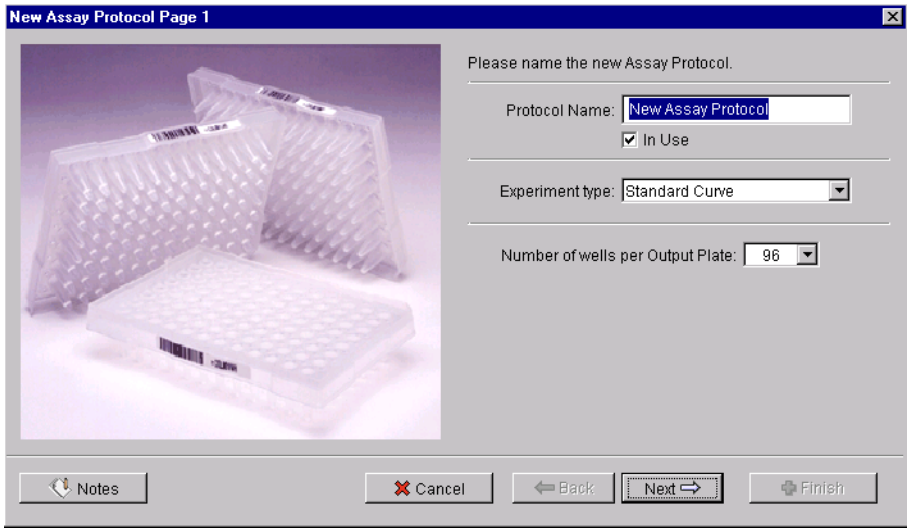


Assay Conditions

When you create a new Assay protocol, you define the conditions displayed on Pages 1–8 of the New Assay Protocol wizard. Each page is shown below.

Note The screen captures of New Assay Protocol Pages 1–9 were taken from a 96-well instrument. If you have a 384-well upgrade, your pages may differ slightly in appearance.

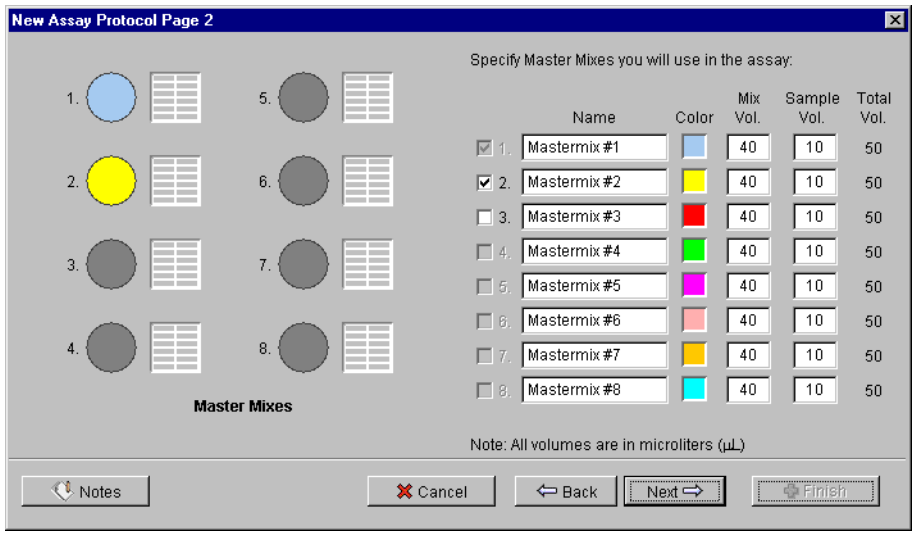
New Assay Protocol Page 1



Page 1 Conditions

Condition	Description	Accepted Values
Protocol Name	A unique name for a specific Assay protocol	♦ A unique combination of letters, numbers, and spaces ♦ Up to 32 characters
Experiment type	The type of assay to perform with the output plates **Note** The **Experiment type** specifies the controls available for the Assay protocol.	♦ Standard Curve ♦ Comparative Quantification ♦ Allelic Discrimination ♦ Plus/Minus ♦ Custom
Number of wells per Output Plate	Determines the kind of output plate being used in the assay	♦ 96 wells ♦ 384 wells, for customers with the 384-well upgrade

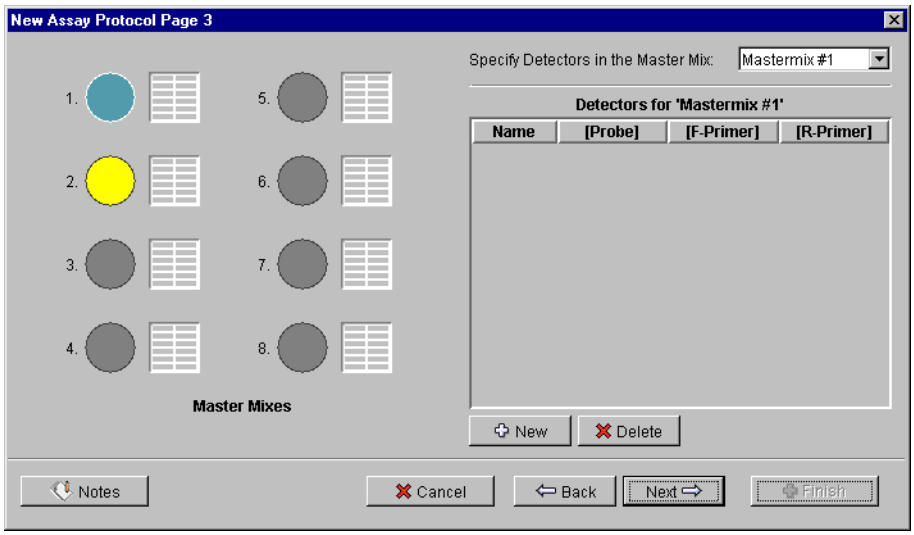
New Assay Protocol Page 2: Master Mixes



Page 2 Conditions

Condition	Description	Accepted Values
Check boxes **1** through **8**	The number of master mixes to use in the assay	♦ For 96-well output: **If you sort output plates by…** / **Then select up to…** Master mix / four master mixes. Master mix and sample / eight master mixes. ♦ For 384-well output, select up to eight master mixes
Name	A unique name for a specific master mix	♦ A unique combination of letters, numbers, and spaces ♦ Up to 32 characters
Color	The color to identify the master mix in the Assay protocol output preview	Swatches, HSB, or RGB
Mix Vol.	The volume of master mix to transfer to the output plates	**96-Well**: 5 to 195 µL **384-Well**: 5 to 15 µL **Note** **Mix Vol.** plus **Sample Vol.** must be ≤200 µL. (96-Well) **Note** **Mix Vol.** plus **Sample Vol.** must be ≤20 µL. (384-Well)
Sample Vol.	The volume of sample to transfer to the output plates	**96-Well**: 5 to 195 µL **384-Well**: 5 to 15 µL **Note** **Mix Vol.** plus **Sample Vol.** must be ≤200 µL. (96-Well) **Note** **Mix Vol.** plus **Sample Vol.** must be ≤20 µL. (384-Well)

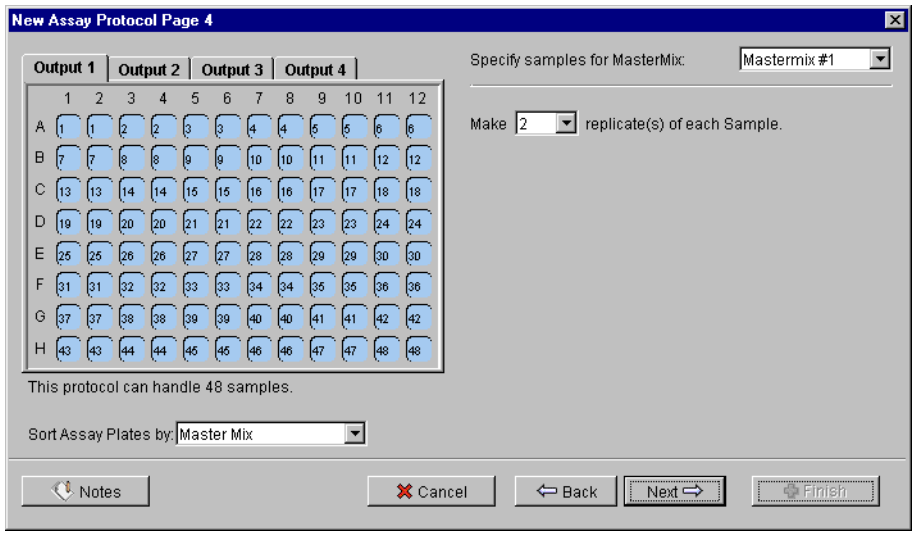
New Assay Protocol Page 3: Detectors



Page 3 Conditions

Condition	Description	Accepted Values
Name	The name of the detector(s) in the master mix	♦ Detectors set up in the database ♦ Up to 12
[Probe]	Probe concentration	0.00001 to 9999999
[F-Primer]	Forward primer concentration	0.00001 to 9999999
[R-Primer]	Reverse primer concentration	0.00001 to 9999999

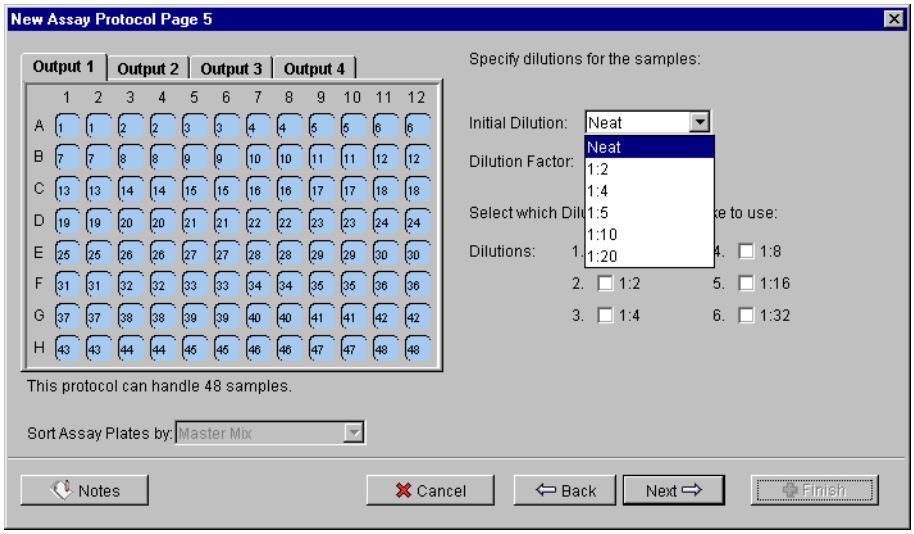
New Assay Protocol Page 4: Master Mix Samples



Page 4 Conditions

Condition	Description	Accepted Values
Make replicate(s) of each Sample	The number of sample replicates to set up	1 to 6
Sort Assay Plates by	How to arrange the samples on the output plates **Note** This is not applicable to a 384-well optical plate.	♦ Master mix ♦ Master mix and sample

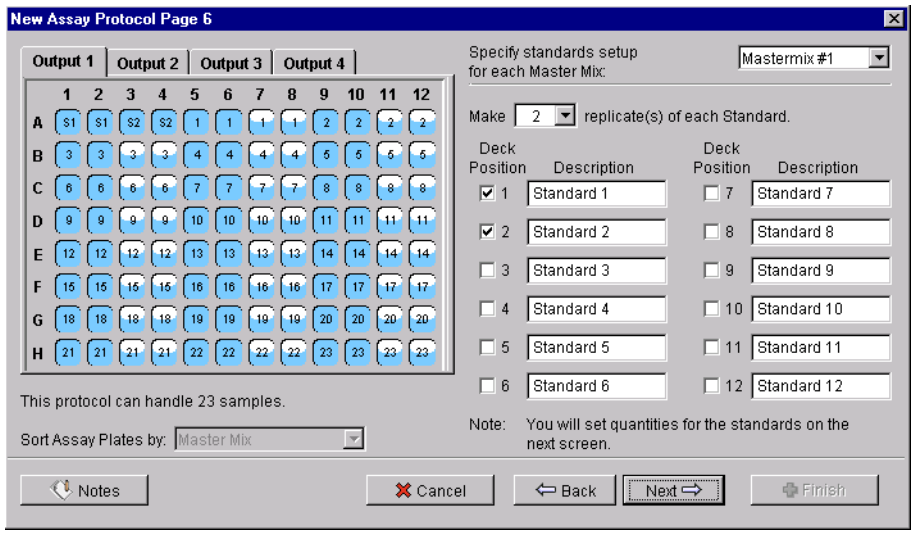
New Assay Protocol Page 5: Sample Dilutions



Page 5 Conditions

Condition	Description	Accepted Values
Initial Dilution	The dilution factor for the first dilution	♦ Neat ♦ 1:2 ♦ 1:4 ♦ 1:5 ♦ 1:10 ♦ 1:20
Dilution Factor	The dilution factor for the second dilution	Values in the pop-up menu vary according to the initial dilution factor
Dilutions	Serial dilutions to use	Values that appear vary according to the initial and second dilution factors **Note** You must check at least one box.

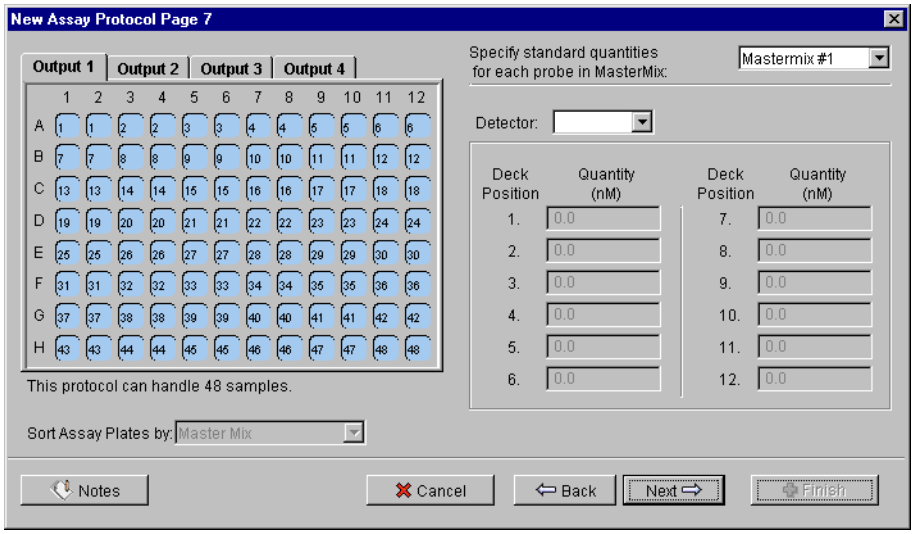
New Assay Protocol Page 6: Standards



Page 6 Conditions

Condition	Description	Accepted Values
Make replicate(s) of each Standard	The number of replicates of standards to set up	1 to 6
Deck Positions	The location of the standard	1 to 12

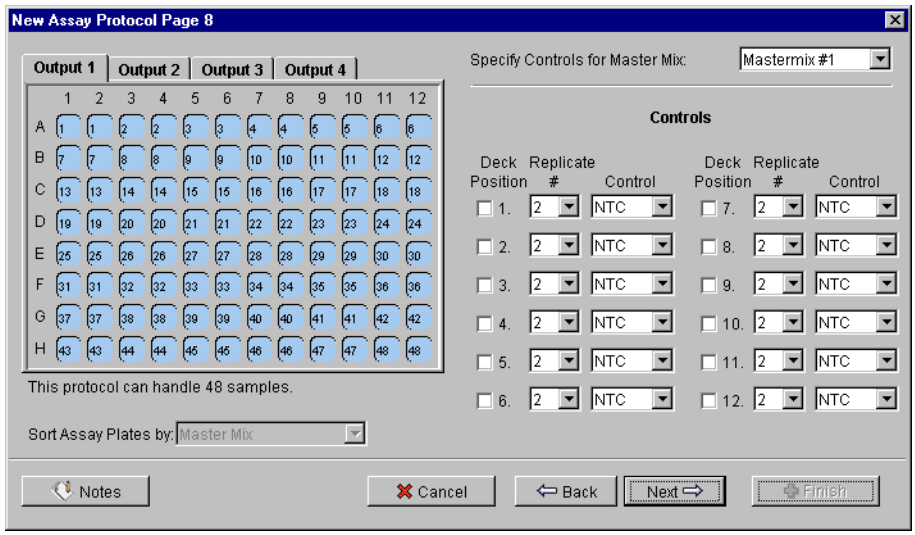
New Assay Protocol Page 7: Standard Quantities



Page 7 Conditions

Condition	Description	Accepted Values
Detector	The name of a detector in the master mix	Values in the pop-up menu vary according to the detectors specified for the master mix
Quantity (nM)	The standard template quantity	0.00001 to 9999999

New Assay Protocol Page 8: Controls



Page 8 Conditions

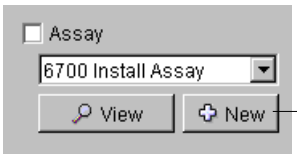
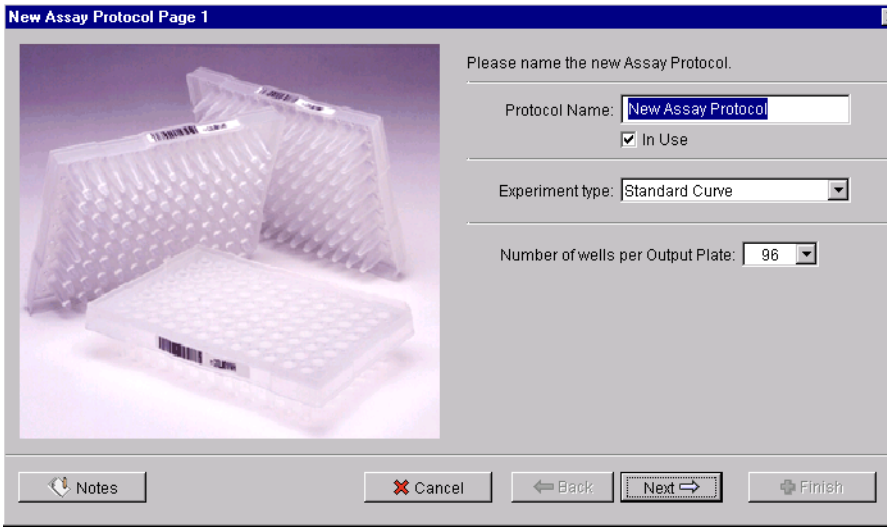
Condition	Description	Accepted Values
Deck Position	The location of the control	1 to 12
Replicate #	The number of replicates of each control to set up	1 to 6
Control	The sample type of the control **Experiment Type** / **Controls Available** Standard Curve: NTC, NPC, NAC Comparative Quantification: NTC, NPC, NAC Allelic Discrimination: AL1, AL2, NTC Plus/Minus: IPC+, IPC-, Buffer, NTC, NAC Custom: All sample types available	Values in the pop-up menu vary according to the experiment type

Assay Protocol Creation for 96-Well Output

Creating an Assay Protocol for 96-Well Output

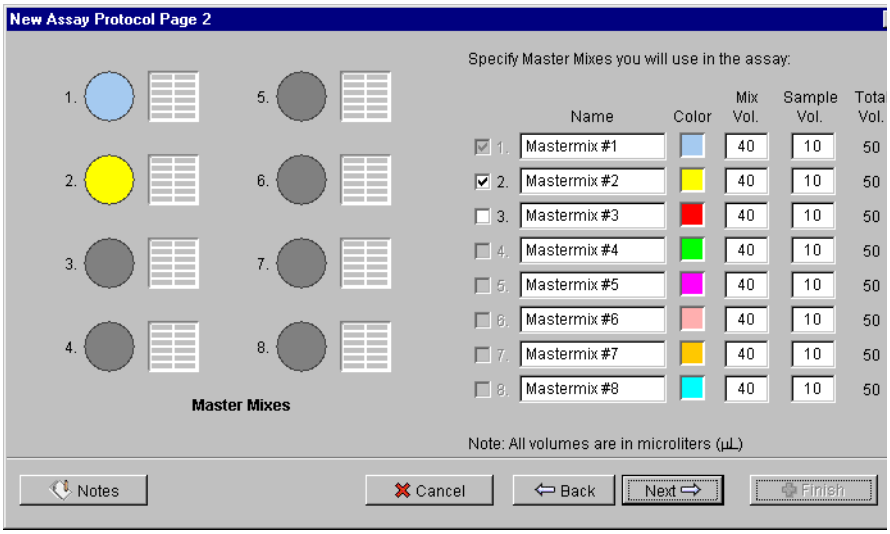
Note To create an assay protocol for 384-well output, see “Assay Protocol Creation for 384-Well Output” on page 4-79.

To create an Assay protocol for 96-well output:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **Assay** protocol.  The **New Assay Protocol Page 1** dialog box appears. 
3	Enter a **Protocol Name**.
4	Select an experiment type from the **Experiment type** pop-up menu.
5	Select **96** from the **Number of wells per Output Plate** pop-up menu. **Note** Assay protocols with 384-well output and 96-well output cannot be run simultaneously.
6	Click **Next**.

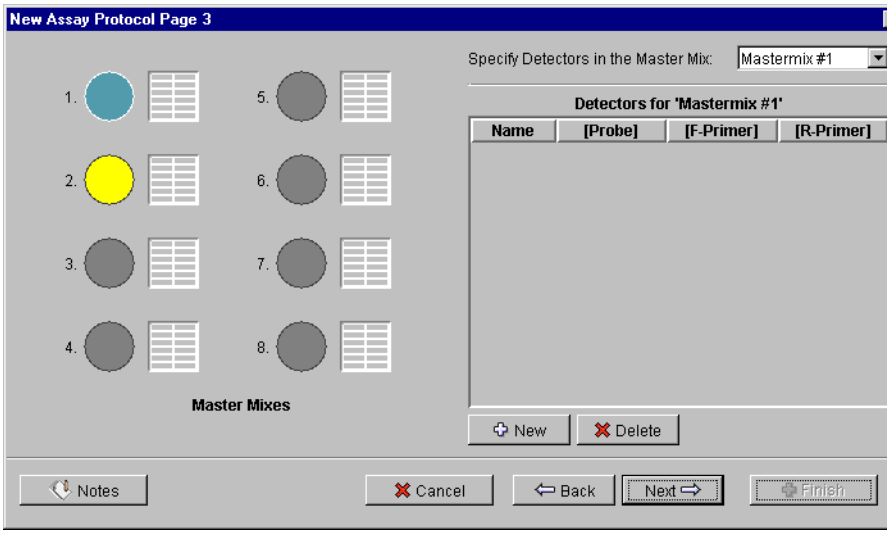
Specifying the Master Mixes

To specify the master mixes:

Step	Action
1	In the **New Assay Protocol Page 2** dialog box, check the box for each master mix. **Note** The number of master mixes you can use varies according to how you sort the output plates in “Specifying Sorting” on page 4-73. **If you sort output plates by… / Then you can use up to…** Master mix — four master mixes. Master mix and sample — eight master mixes. 
2	Enter the **Name** of each master mix.
3	Specify the color for each master mix: a. Click the **Color** box. A **Select Master Mix Color** dialog box appears. b. Choose a color using the **Swatches**, **HSB**, or **RGB** tabs. c. Preview the color in the **Preview** pane. d. Click **OK** to change the color. **Note** The 6700 software uses the colors here to indicate the master mixes present in Assay protocol output previews (see “Specifying Replicates for Master Mixes” on page 4-73).
4	In the **Mix Vol.** column, enter a value from 5 to 195 (µL) for the volume of each master mix to transfer to the output plates. **Note** The sum of the **Mix Vol.** and **Sample Vol.** must be ≤200 µL.
5	In the **Sample Vol.** column, enter a value from 5 to 195 (µL) for the volume of sample to transfer to the output plates. **IMPORTANT** The sum of the **Mix Vol.** and **Sample Vol.** must be ≤200 µL. The software calculates and updates the **Total Vol.** column (**Mix Vol.**+ **Sample Vol.**).
6	Click **Next**.

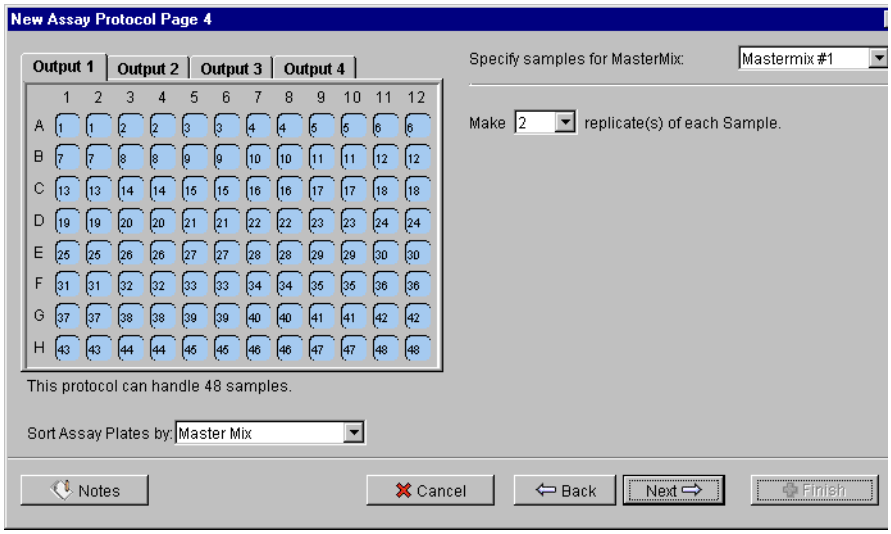
Specifying Master Mix Detectors

To specify master mix detectors:

Step	Action
1	In the **New Assay Protocol Page 3** dialog box, select a master mix from the **Specify Detectors in the Master Mix** pop-up menu. 
2	Specify detectors: a. To add a detector, click **New**. A detector with **[Probe]**, **[F-Primer]**, and **[R-Primer]** values appears. b. To select a detector, click the detector name to access the detector pop-up menu. c. To change **[Probe]**, **[F-Primer]**, and **[R-Primer]** values, double-click the numbers. **Note** If the detector is not available in the pop-up menu, see “Setting Up Detectors” on page 4-56 to verify detector setup.
3	Repeat steps 1 and 2 until you specify all detectors in all master mixes.
4	Click **Next**.

Specifying Replicates for Master Mixes

To specify replicates for master mixes:

Step	Action
1	In the **New Assay Protocol Page 4** dialog box, select a master mix from the **Specify samples for Master Mix** pop-up menu. 
2	For the master mix specified, select the number of replicates to make from the **Make replicate(s) of each Sample** pop-up menu. **Note** A message is displayed below the output graphic indicating how many samples can be run with the current protocol. The number updates when you make changes to the protocol (*e.g.,* change the number of replicates, the number of dilutions for output, etc.).
3	Repeat steps 1 and 2 until you specify the number of replicates for all master mixes.

Specifying Sorting

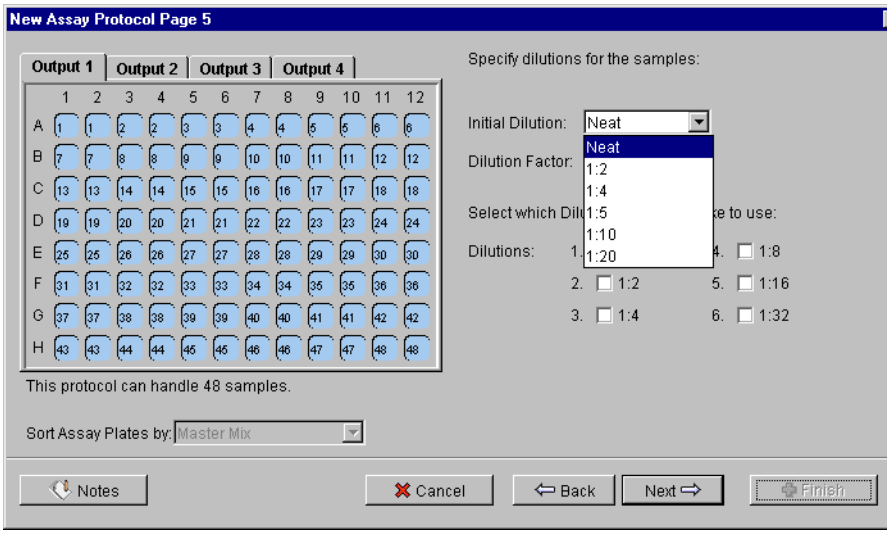
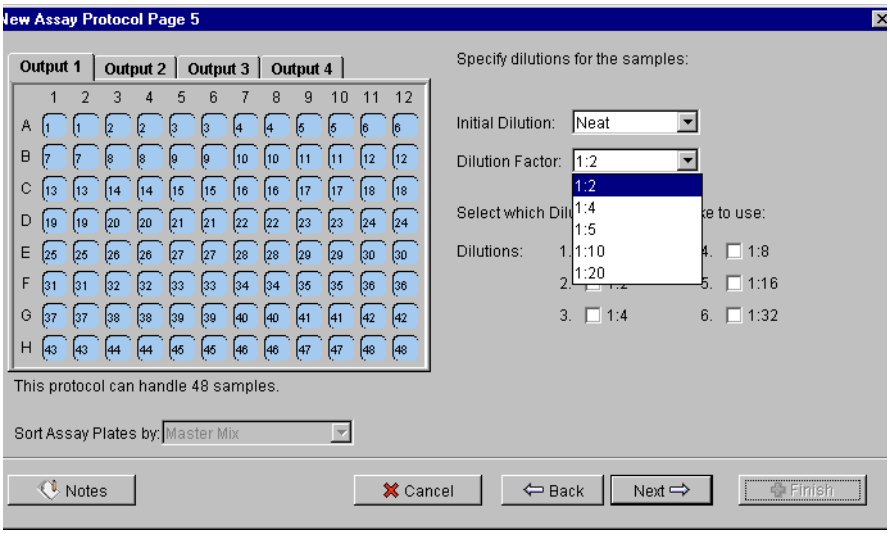
To specify sorting of output plates:

Step	Action
1	Choose a sorting method from the **Sort Assay Plates by** pop-up menu. **If you sort output plates by…** / **Then you can use up to…** Master mix / four master mixes. Master mix and sample / eight master mixes.
2	Click **Next**.

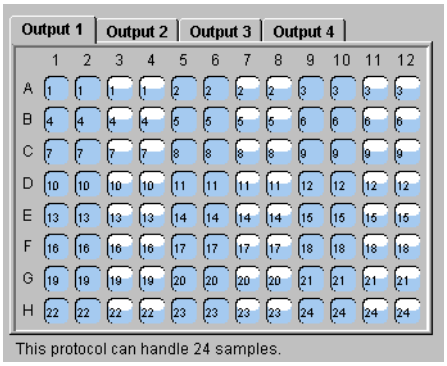
Specifying Dilutions

IMPORTANT Assay protocols that specify dilutions cannot follow Dilution Archive protocols in an instrument run.

To specify dilutions:

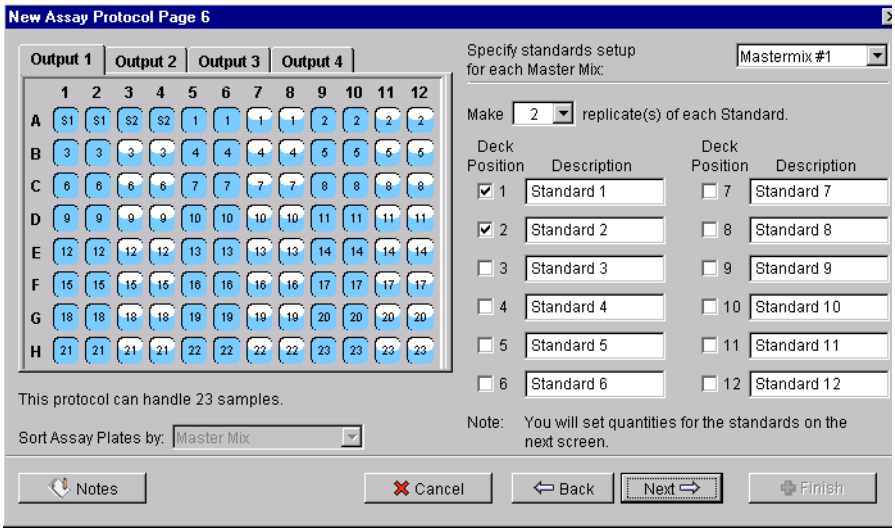
Step	Action
1	In the **New Assay Protocol Page 5** dialog box, select the first dilution conditions from the **Initial Dilution** pop-up menu. 
2	Select the second dilution conditions from the **Dilution Factor** pop-up menu. **Note** The dilutions available for output plates vary according to the **Dilution Factor** you select. 

To specify dilutions: *(continued)*

Step	Action
3	Check the **Dilutions** check boxes to select the dilutions to use for output plates. The software adjusts the amount of color in each well according to the serial dilution present in the well. **Note** You must check at least one box. 
4	Click **Next**.

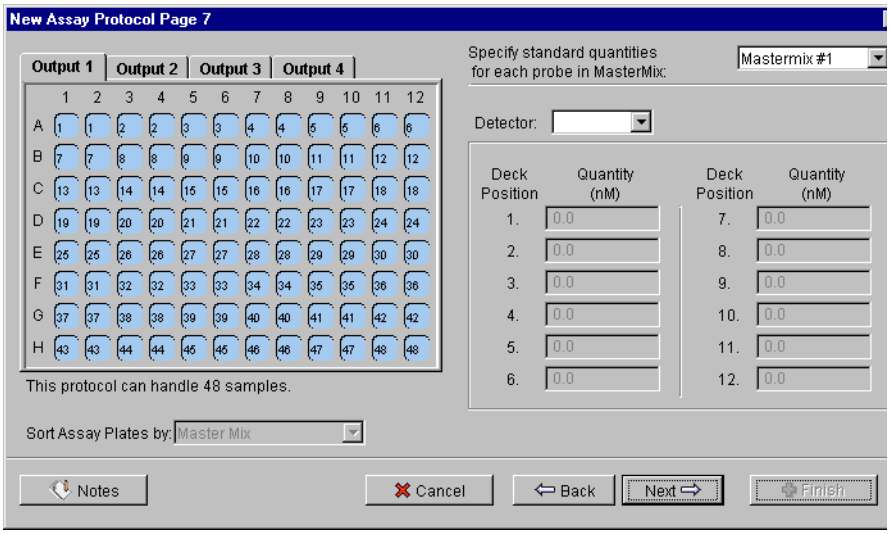
Specifying Standards for Master Mixes

To specify standards for master mixes:

Step	Action
1	In the **New Assay Protocol Page 6** dialog box, select a master mix from the **Specify standards setup for each Master Mix** pop-up menu. 
2	Select the number of replicates to make from the **Make replicate(s) of each Standard** pop-up menu.
3	Check the **Deck Position** check boxes to designate the location of the standards on the deckspace.
4	Repeat steps 1 through 3 until you specify standards for all master mixes.
5	Click **Next**.

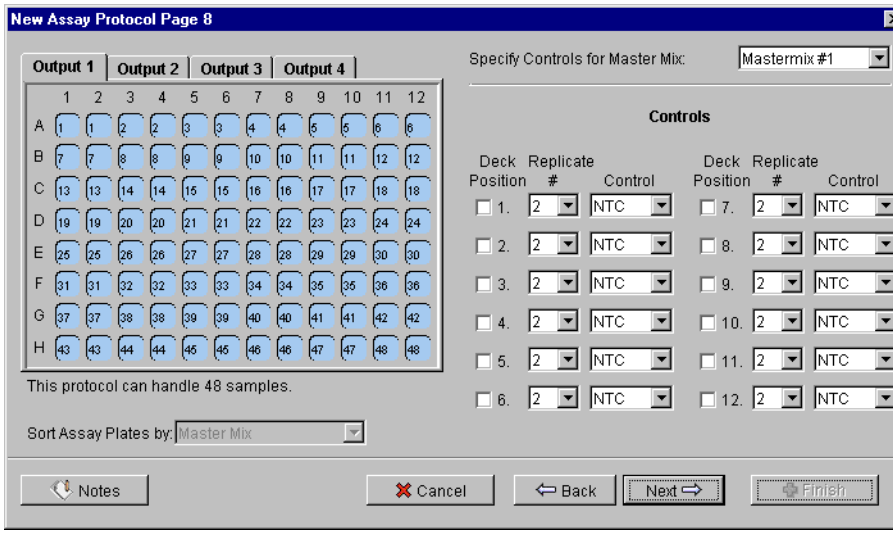
Specifying Standard Quantities

To specify standard quantities:

Step	Action
1	In the **New Assay Protocol Page 7** dialog box, select a master mix from the **Specify standard quantities for each probe in Master Mix** pop-up menu. 
2	Select a detector from the **Detector** pop-up menu. **Note** Detectors available in the pop-up menu vary according to the detectors indicated in the **New Assay Protocol Page 3** dialog box (see "Specifying Master Mix Detectors" on page 4-72). **Quantity** fields become active for deckspace positions that contain the selected master mix, the selected detector, and standards.
3	In the **Quantity** fields, enter the standard template quantity for each standard. **Note** If you are going to use the **Output Setup Plate** file in the ABI PRISM® 7900HT Sequence Detection System, you must type in the starting copy number (1 to 99,000) in the **Quantity** field.
4	Repeat steps 1 through 3 until you specify standard template quantities for each detector in all master mixes.
5	Click **Next**.

Specifying Controls for Master Mixes

To specify controls for master mixes:

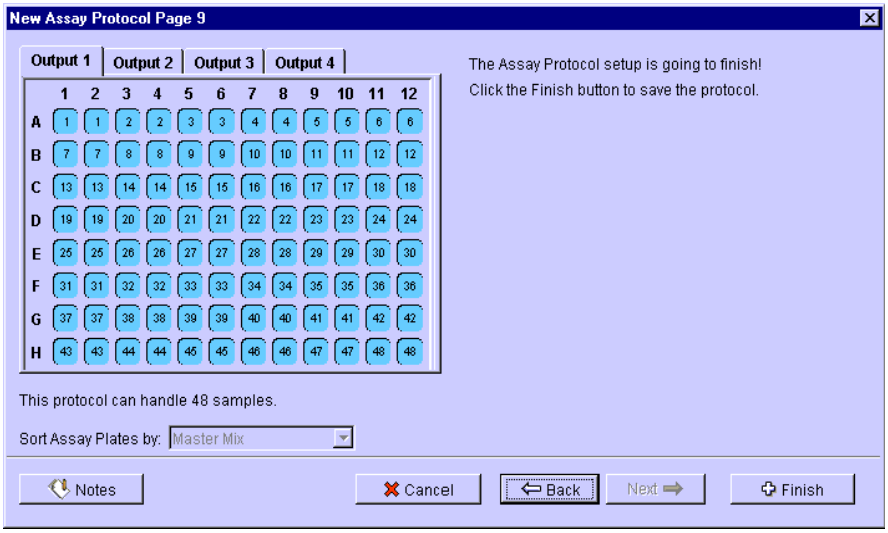
Step	Action
1	In the **New Assay Protocol Page 8** dialog box, select a master mix from the **Specify Controls for Master Mix** pop-up menu. 
2	Check the **Deck Position** check boxes to designate the location of the controls on the deckspace.
3	For each control, select the number of replicates to set up from the **Replicate #** pop-up menu.
4	For each control, specify the sample type from the **Control** pop-up menu. **Note** Sample types available in the pop-up menu vary according to the **Experiment type** selected in "Creating an Assay Protocol for 96-Well Output" on page 4-70.
5	Repeat steps 1 through 4 until you specify controls for all master mixes.
6	Click **Next**.

Experiment Type	Controls Available
Standard Curve	NTC, NPC, NAC
Comparative Quantification	NTC, NPC, NAC
Allelic Discrimination	AL1, AL2, NTC
Plus/Minus	IPC+, IPC-, Buffer, NTC, NAC
Custom	All sample types available[a]

a. See "Setting Up Sample Types" on page 4-59 for more information about sample types.

Completing the Protocol

To complete the protocol:

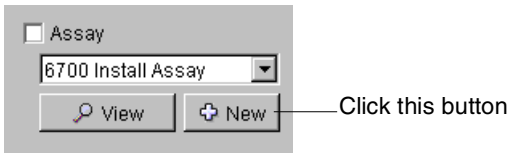
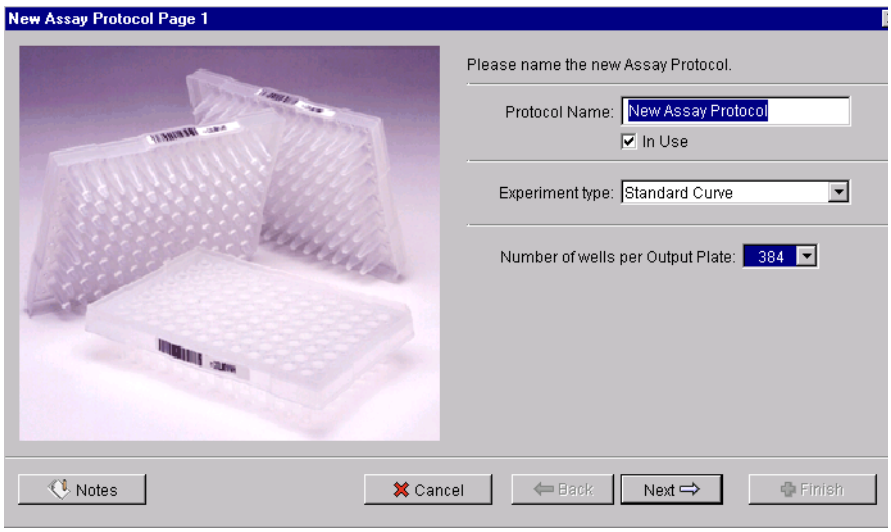
Step	Action
1	In the **New Assay Protocol Page 9** dialog box, view the output plates by clicking the different **Output** tabs.  **Note** The colors of the wells indicate which master mix is used (see “Specifying the Master Mixes” on page 4-71 for more information).
2	Click **Finish** to save this protocol and to return to the **Protocol** tab.

Assay Protocol Creation for 384-Well Output

Creating an Assay Protocol for 384-Well Output

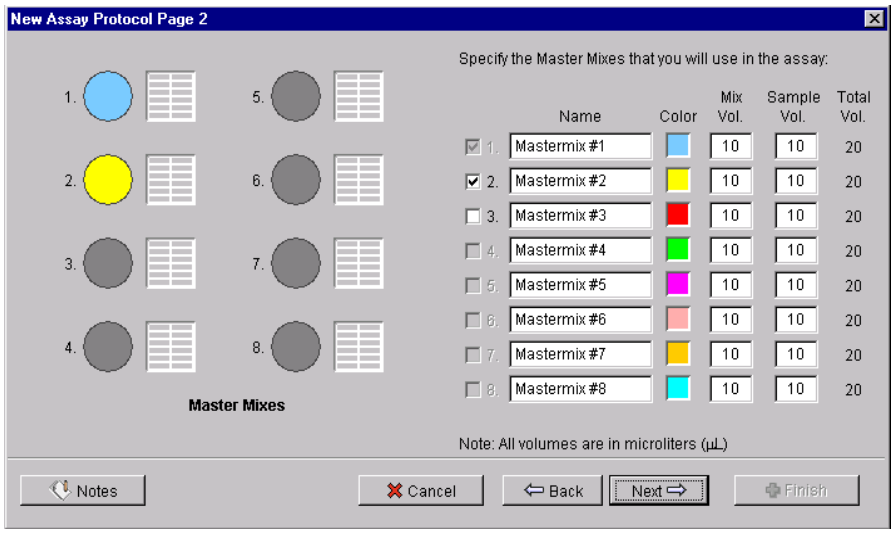
Note To create a protocol for 96-well output, see “Assay Protocol Creation for 96-Well Output” on page 4-70.

To create an Assay protocol for 384-well output:

Step	Action
1	Go to the **Protocol** tab of the 6700 software.
2	In the **Protocol** section, click the **New** button under the **Assay** protocol.  The **New Assay Protocol Page 1** dialog box appears. 
3	Enter a **Protocol Name**.
4	Select the **Experiment type** from the pop-up menu.
5	Choose **384** from the **Number of wells per Output Plate** pop-up menu. **Note** Assay protocols with 384-well output and 96-well output cannot be run simultaneously.
6	Click **Next**.

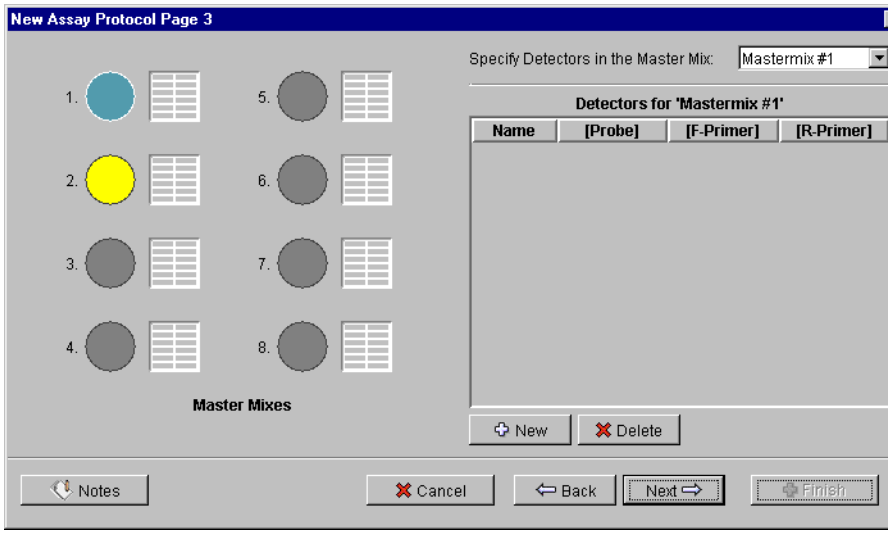
Specifying the Master Mixes

To specify the master mixes:

Step	Action
1	In the **New Assay Protocol Page 2** dialog box, check the box for each master mix. You may use up to eight master mixes. 
2	Enter the **Name** of each master mix.
3	Specify the color for each master mix. a. Click the **Color** box. A **Select Master Mix Color** dialog box appears. b. Choose a color using the **Swatches**, **HSB**, or **RGB** tabs. c. Preview the color in the **Preview** pane. d. Click **OK** to change the color. **Note** The 6700 software uses the colors here to indicate the master mixes present in Assay protocol output previews (see "Specifying Replicates for Master Mixes" on page 4-82).
4	In the **Mix Vol.** column, enter a value from 5 to 15 (µL) for the volume of each master mix to transfer to the output plates. **Note** The sum of the **Mix Vol.** and **Sample Vol.** must be ≤20 µL.
5	In the **Sample Vol.** column, enter a value from 5 to 15 (µL) for the volume of sample to transfer to the output plates. **Note** The sum of the **Mix Vol.** and **Sample Vol.** must be ≤20 µL. The software calculates and updates the **Total Vol.** column (**Mix Vol.**+ **Sample Vol.**).
6	Click **Next**.

Specifying Master Mix Detectors

To specify master mix detectors:

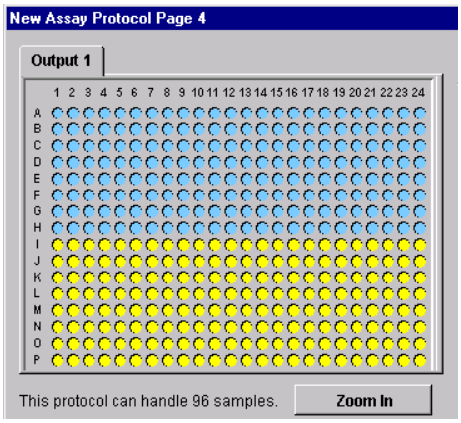
Step	Action
1	In the **New Assay Protocol Page 3** dialog box, select a master mix from the **Specify Detectors in the Master Mix** pop-up menu. 
2	Specify detectors: a. To add a detector, click **New**. A detector with **[Probe]**, **[F-Primer]**, and **[R-Primer]** values appears. b. To select a detector, click the detector name to access the detector pop-up menu. c. To change **[Probe]**, **[F-Primer]**, and **[R-Primer]** values, double-click the numbers. **Note** If the detector is not available in the pop-up menu, see “Setting Up Detectors” on page 4-56 to verify detector setup.
3	Repeat steps 1 and 2 until you specify all detectors in all master mixes.
4	Click **Next**.

Specifying Replicates for Master Mixes

To specify replicates for master mixes:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>In the New Assay Protocol Page 4 dialog box, note the display:

<table>
<tr><th>If you are using the 384-well upgrade and using...</th><th>Then the dialog box shows...</th></tr>
<tr><td>a 384-well optical plate</td><td>Output tab 1 only.

Note You can change your view of Output tab 1 by clicking the Zoom In/Zoom Out toggle button. To see the wells in more detail, click Zoom In, and scroll if necessary.</td></tr>
<tr><td>a 96-well optical plate(s)</td><td>Output tabs 2, 3, and 4.

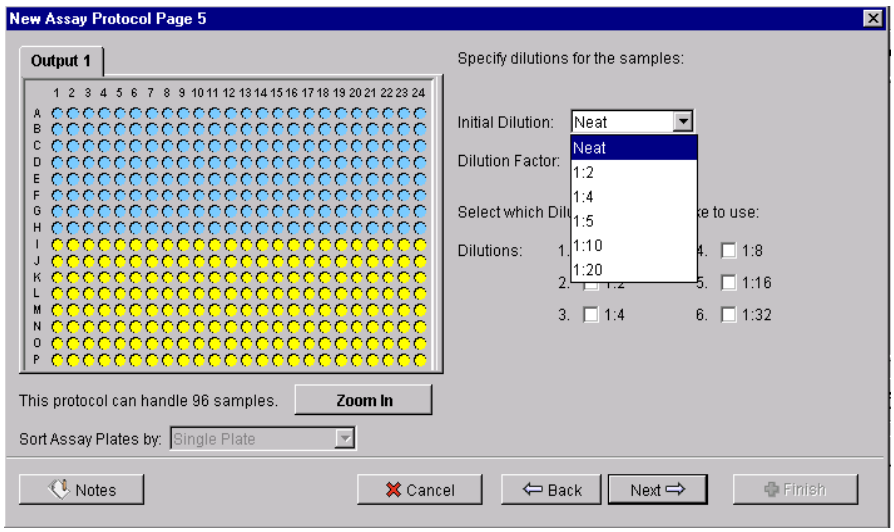
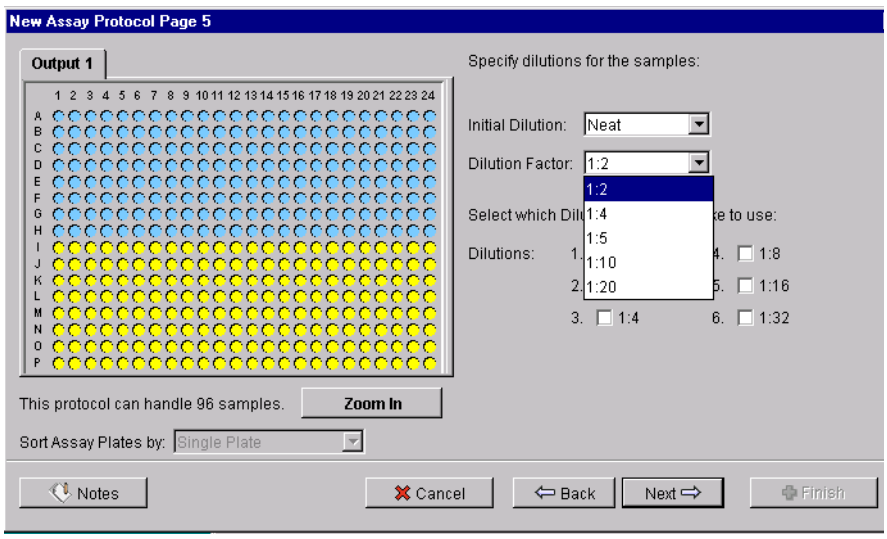
For these procedures, see “Assay Protocol Creation for 96-Well Output” on page 4-70.</td></tr>
</table></td></tr>
<tr><td>2</td><td>Select a master mix from the Specify samples for each Master Mix pop-up menu.</td></tr>
<tr><td>3</td><td>For the master mix specified, select the number of replicates to make from the Make replicate(s) of each Sample pop-up menu.

Note A message is displayed below the output graphic indicating how many samples can be run with the current protocol. The number updates when you make changes to the protocol (e.g., change the number of replicates, the number of dilutions for output, etc.).</td></tr>
<tr><td>4</td><td>Repeat steps 1 and 2 until you specify the number of replicates for all master mixes.</td></tr>
</table>

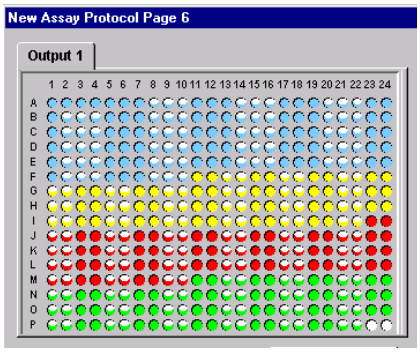
Specifying Dilutions

IMPORTANT Assay protocols that specify dilutions cannot follow Dilution Archive protocols in an instrument run.

To specify dilutions:

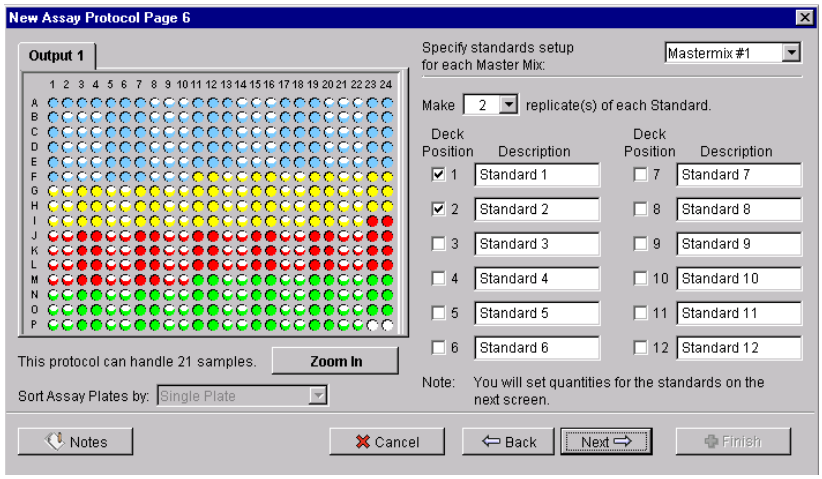
Step	Action
1	In the **New Assay Protocol Page 5** dialog box, select the first dilution conditions from the **Initial Dilution** pop-up menu. 
2	Select the second dilution conditions from the **Dilution Factor** pop-up menu. **Note** The dilutions available for output plates vary according to the **Dilution Factor** you select. 

To specify dilutions: *(continued)*

Step	Action
3	Check the **Dilutions** check boxes to select the dilutions to use for output plates. The software adjusts the amount of color in each well according to the serial dilution present in the well. **Note** You must check at least one box. 
4	Click **Next**.

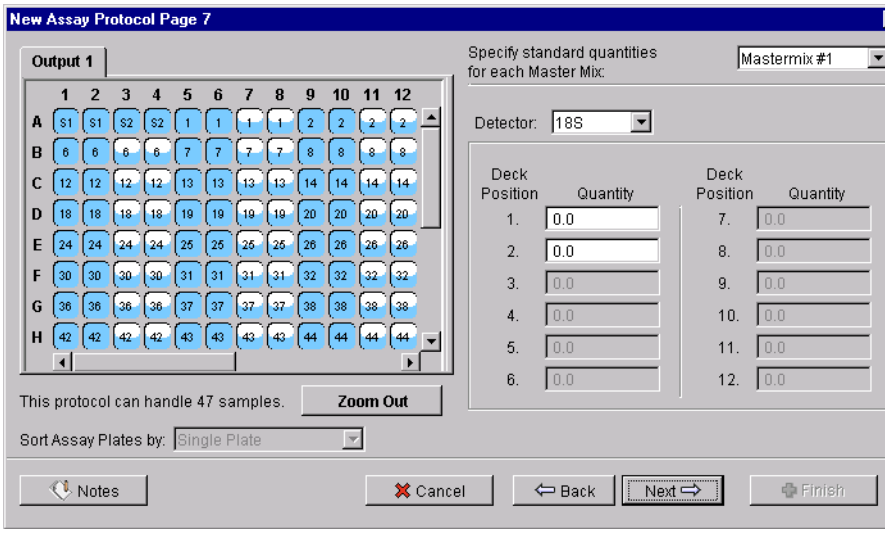
Specifying Standards for Master Mixes

To specify standards for master mixes:

Step	Action
1	In the **New Assay Protocol Page 6** dialog box, select a master mix from the **Specify standards setup for each Master Mix** pop-up menu. 
2	Select the number of replicates to make from the **Make replicate(s) of each Standard** pop-up menu.
3	Check the **Deck Position** check boxes to designate the location of the standards on the deckspace.
4	Repeat steps 1 through 3 until you specify standards for all master mixes.
5	Click **Next**.

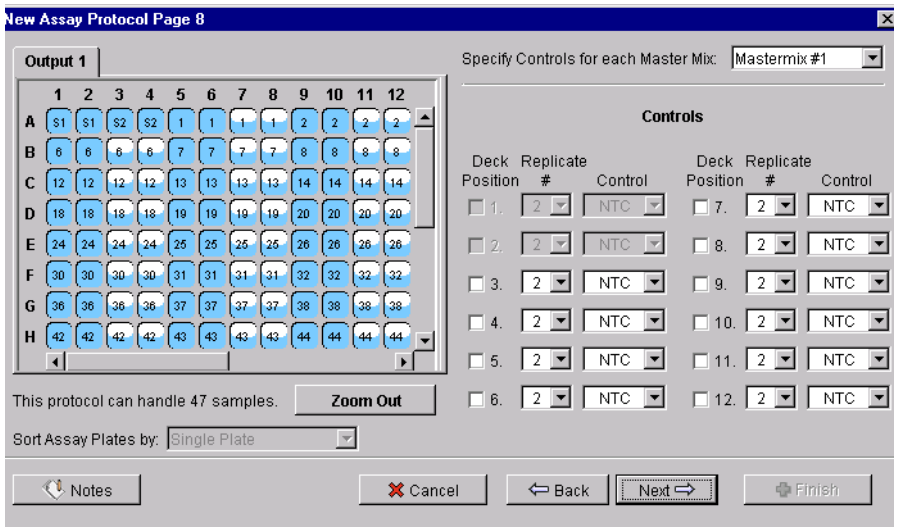
Specifying Standard Quantities

To specify standard quantities:

Step	Action
1	In the **New Assay Protocol Page 7** dialog box, select a master mix from the **Specify standard quantities for each Master Mix** pop-up menu. **Note** The dialog box below shows an enlarged ("zoomed") view of the **Output 1** tab. You can change your view of the **Output 1** tab by clicking the **Zoom In/Zoom Out** toggle button. 
2	Select a detector from the **Detector** pop-up menu. **Note** Detectors available in the pop-up menu vary according to the detectors indicated in the **New Assay Protocol Page 3** dialog box (see "Specifying Master Mix Detectors" on page 4-81). **Quantity** fields become active for deckspace positions that contain the selected master mix, the selected detector, and standards.
3	In the **Quantity** fields, enter the standard template quantity for each standard. **Note** If you are going to use the **Output Setup Plate** file in the ABI PRISM® 7900HT Sequence Detection System, you must type in the starting copy number (1 to 99,000) in the **Quantity** field.
4	Repeat steps 1 through 3 until you specify standard template quantities for each detector in all master mixes.
5	Click **Next**.

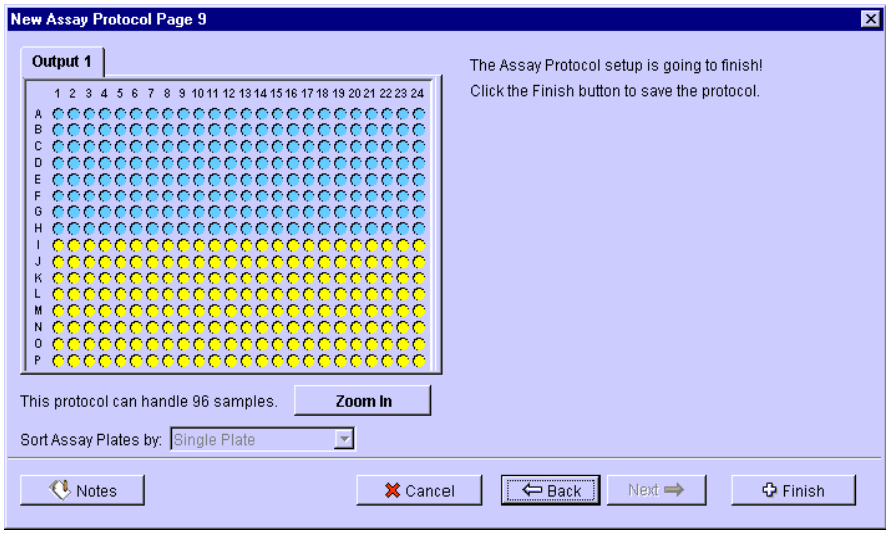
Specifying Controls for Master Mixes

To specify controls for master mixes:

Step	Action
1	In the **New Assay Protocol Page 8** dialog box, select a master mix from the **Specify Controls for Master Mix** pop-up menu. **Note** The dialog box below shows an enlarged ("zoomed") view of the **Output 1** tab. You can change your view of the **Output 1** tab by clicking the **Zoom In/Zoom Out** toggle button. 
2	Check the **Deck Position** check boxes to designate the location of the controls on the deckspace.
3	For each control, select the number of replicates to set up from the **Replicate #** pop-up menu.
4	For each control, specify the sample type from the **Control** pop-up menu. **Note** Sample types available in the pop-up menu vary according to the **Experiment type** selected in "Creating an Assay Protocol for 384-Well Output" on page 4-79. **Experiment Type** / **Controls Available** Standard Curve — NTC, NPC, NAC Comparative Quantification — NTC, NPC, NAC Allelic Discrimination — AL1, AL2, NTC Plus/Minus — IPC+, IPC-, Buffer, NTC, NAC Custom — All sample types available[a] a. See "Setting Up Sample Types" on page 4-59 for more information about sample types.
5	Repeat steps 1 through 4 until you specify controls for all master mixes.
6	Click **Next**.

Completing the Protocol

To complete the protocol:

Step	Action
1	In the **New Assay Protocol Page 8** dialog box, view the output plate.  **Note** The colors of the wells indicate which master mix is used (see “Specifying the Master Mixes” on page 4-80 for more information).
2	Click **Finish** to save this protocol and to return to the **Protocol** tab.

5 Maintenance

Overview

About This Chapter

This chapter contains information about schedules and procedures for maintaining the ABI PRISM™ 6700 Automated Nucleic Acid Workstation.

In This Chapter

This chapter contains the following topics:

Topic	See Page
Instrument Maintenance Overview	5-2
Maintenance Procedures	5-4

Instrument Maintenance Overview

Maintenance Recommendation

IMPORTANT Preventive maintenance of the 6700 workstation is required to ensure instrument reliability and accuracy.

Maintenance Schedules

Maintenance of the 6700 workstation should occur as follows:

- Daily maintenance

  Perform at the end of each day or after 8 hours of operation.

- Weekly maintenance

  Perform at the end of each week or after 40 hours of operation.

- Periodic maintenance

  Perform after approximately 6 months of operation.

Maintenance and Chemical Waste

IMPORTANT Some of the maintenance procedures require that you handle chemical waste. Please read and follow the chemical waste hazard warning below.

⚠ WARNING CHEMICAL WASTE HAZARD. Wastes produced by Applied Biosystems instruments are potentially hazardous and can cause injury, illness, or death.

- Read and understand the material safety data sheets (MSDSs) provided by the manufacturers of the chemicals in the waste container before you store, handle, or dispose of chemical waste.
- Handle chemical wastes in a fume hood.
- Minimize contact with and inhalation of chemical waste. Wear appropriate personal protective equipment when handling chemicals (*e.g.,* safety glasses, gloves, or protective clothing).
- After emptying the waste container, seal it with the cap provided.
- Dispose of the contents of the waste tray and waste container in accordance with good laboratory practices and local, state/provincial, or national environmental and health regulations.

Maintenance and Biologically Hazardous Material

If you expose the 6700 instrument enclosure to potentially biologically hazardous material (*e.g.*, blood or plasma), you need to contact a certified professional to decontaminate the 6700 instrument enclosure with formaldehyde vapor.

IMPORTANT These decontamination procedures must be performed by a certified professional before an Applied Biosystems service engineer can service the instrument.

See Appendix A, “Instrument Decontamination,” for more information.

Daily Maintenance Checklist

IMPORTANT Performing daily maintenance will improve the 6700 workstation's performance and reliability.

To perform daily maintenance:

Step	Action	See Page
Before Every Run:		
1	Check the waste container: a. Empty and clean the container if it is more than 50% full. **IMPORTANT** If the waste container overfills, liquid waste will flow into the inline filter. This makes it impossible to pull any vacuum and requires inline filter replacement. b. Verify that the lid of the waste container is tightened. **IMPORTANT** If the lid of the waste container is loose, the instrument may not be able to apply sufficient vacuum pressure during RNA/DNA Archive protocols.	5-5
2	Flush system lines for 60 seconds.	5-6
3	Tighten the robotic arm tips with the white Teflon tip tightener. **⚠ CAUTION** Never touch the gold robotic arm tips with bare fingers. The oil from your skin will affect the functionality of the 6700 instrument.	5-8
4	Finger-tighten diluter syringes.	5-9
After Every Run:		
5	Empty the tip eject bin. Replace the disposable tip eject bin liner (P/N 4316565) if needed.	5-4
6	Clean the deckspace with an appropriate cleaning agent.	5-9
7	Check the level of system fluid. If the container is less than 25% full, add system fluid until the container is 75% full. **IMPORTANT** Do not overfill the system fluid container. Overfilling causes bubbles to form in the fluid lines.	5-8

Weekly Maintenance Checklist

To perform weekly maintenance:

Step	Action	See Page
1	Perform the tasks listed in the "Daily Maintenance Checklist."	5-3
2	Check the diluter valves for leaks.	5-9
3	Check the system fluid lines.	5-7
4	Check the fluid lines for microbial growth. **Note** If microbial growth is present, perform the procedure in "Replacing System Fluid" on page 5-8.	5-7

Annual Maintenance

Applied Biosystems service representatives perform annual maintenance of the 6700 workstation.

Maintenance Procedures

Emptying the Tip Eject Bin

To empty the tip eject bin:

Step	Action
1	Remove any reagent reservoirs from the reagent reservoir platform.
2	Loosen the captive screw on the reagent reservoir platform.
3	Carefully detach the reagent reservoir platform by moving it slightly forward, then lifting upward.
4	Remove the tip eject bin liner and dispose of the liner and the pipette tips. **⚠ WARNING** Always follow the safety precautions regarding waste in the waste profile. Dispose of the waste in accordance with all local, state, and federal health and environmental regulations and laws.
5	Place a new disposable tip eject bin liner (P/N 4316565) in the tip eject bin.
6	Replace the reagent reservoir platform on the deckspace.
7	Finger-tighten the captive screw on the platform until it fits snugly. **Note** It is not necessary to use a screwdriver to tighten the captive screw.

Emptying and Cleaning the Waste Container

Empty and clean the waste container if it is more than 50% full.

IMPORTANT If the waste container overfills, liquid waste will flow into the inline filter. This makes it impossible to pull any vacuum and requires inline filter replacement.

To empty the waste container:

Step	Action
1	Remove any plates from the vacuum station.
2	Pour 50 mL of a germicidal detergent into the waste container to inactivate any potentially infectious biohazardous chemicals. For a germicidal detergent we recommend: ♦ Envirocide disinfectant[a] OR ♦ Process Vesphene IIst™ Environmental Disinfectant[b] Prepare each according to package instructions. **⚠ WARNING CHEMICAL HAZARD**. **Envirocide disinfectant** may cause eye and skin irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ DANGER CHEMICAL HAZARD**. **Process Vesphene IIst Environmental Disinfectant** is corrosive. Exposure may cause eye and skin damage (burns). It is harmful if swallowed. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ WARNING BIOHAZARD**. Biological samples such as tissues and blood have the potential to transmit infectious diseases. Follow the U.S. Department of Health and Human Services guidelines published in *Biosafety in Microbiological and Biomedical Laboratories* (stock no. 017-040-00547-4) and in Occupational Safety and Health Standards, Toxic and Hazardous Substances (29 CFR §1910.1030) concerning the principles of risk assessment, biological containment, and safe laboratory practices for activities involving clinical specimens. You can obtain additional information by connecting to the government Web site http://www.cdc.gov.
3	Close the 6700 instrument door.
4	In the 6700 software, set the instrument to pull a vacuum into the waste container: a. From the **Instrument Menu**, scroll to **Tests** and select **Function Tests**. A **Function Tests** window appears. b. Click the **Purification** tab. Purification tests appear. c. Check the box next to **Perform 'Vacuum' Test**. d. From the **Vacuum Location** pop-up menu, select **Waste**. e. From the **Carriage Location** pop-up menu, select **Filtrate**. f. From the **Vacuum Intensity** pop-up menu, select **50%**. g. Enter **30** in the **Time/secs** box.
5	Once the vacuum is completed, exit the 6700 software.
6	Using the power button on the front of the instrument, turn off the instrument. The LED lights and the interior lights turn off.

To empty the waste container: *(continued)*

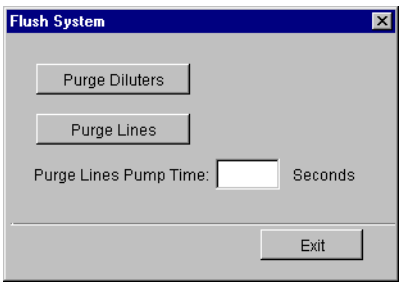
Step	Action
7	Disconnect the waste fluid lines from the waste container using the quick-disconnectors. **Note** The quick-disconnectors self-seal to limit the amount of fluid that spills from them.
8	Wipe off any drops from the quick-disconnectors with lint-free tissues and the germicidal detergent (Envirocide disinfectant or Process Vesphene IIst Environmental Disinfectant). **⚠ WARNING CHEMICAL HAZARD**. **Envirocide disinfectant** may cause eye and skin irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ DANGER CHEMICAL HAZARD**. **Process Vesphene IIst Environmental Disinfectant** is corrosive. Exposure may cause eye and skin damage (burns). It is harmful if swallowed. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
9	Empty the waste container in an appropriate waste disposal receptacle. **⚠ WARNING** Always follow the safety precautions regarding waste in the waste profile. Dispose of the waste in accordance with all local, state, and federal health and environmental regulations and laws.
10	Reconnect the waste container to the waste fluid lines.
11	**IMPORTANT** Make sure: ♦ All quick-disconnectors are fully seated ♦ The waste cap is fully seated and its vent plug is in place

a. Envirocide disinfectant is available from Viro Research (P/N 30128).

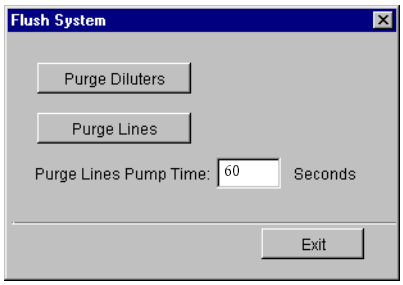
b. Process Vesphene IIst Environmental Disinfectant is available from Steris Corporation at telephone number 1-800-JIT-4-USE (1-800-548-4873) or through their Web site at http://www.steris.com.

Flushing the System

To flush the system:

Step	Action
1	Firmly tighten all tubing connections.
2	From the **Instrument Menu**, scroll to **Utility** and select **System Flush**. The **System Flush** dialog box appears. 
3	Click **Purge Diluters**. The instrument initializes, then purges the diluter lines.

To flush the system: *(continued)*

Step	Action
4	Using the **Flush System** dialog box, enter **60** (seconds) in the **Purge Lines Pump Time** field. 
5	Click **Purge Lines**. The instrument initializes, then purges the lines for the specified time.
6	Inspect the fluid lines: a. Verify that liquid is present in the lines. b. Verify that no bubbles are present in the lines. c. Verify that no leaks are present. d. Verify that liquid does not drip from the lines after a few minutes.

Checking the Fluid Lines

To check the fluid lines:

Step	Action
1	Firmly tighten all tubing connections.
2	Check the system fluid lines for microbial growth. If any growth is present: a. Replace the system fluid with fresh Model 6700 System Fluid (P/N 4308456). See “Replacing System Fluid” on page 5-8. **⚠ CAUTION** **Model 6700 System Fluid**. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. b. Flush the system. See “Flushing the System” on page 5-6.
3	Check the fluid lines for air bubbles. If the fluid lines contain air bubbles, flush the system. See “Flushing the System” on page 5-6.
4	Check the tubing connections for leaks. **IMPORTANT** If any leaks are present, contact an Applied Biosystems service representative for assistance.

Replacing System Fluid

To replace the system fluid:

Step	Action
1	Using the power button on the front of the instrument, turn off the instrument. The LED lights and the interior lights turn off.
2	Disconnect the system fluid lines from the system fluid container using the quick-disconnectors. **Note** The quick-disconnectors self-seal to limit the amount of fluid that spills from them.
3	Wipe off any drops from the quick-disconnectors with lint-free tissues.
4	Empty the system fluid in an appropriate waste disposal receptacle. **⚠ CAUTION** **Model 6700 System Fluid**. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
5	Pour fresh Model 6700 System Fluid (P/N 4308456) into the system fluid container until the container is 75% full. **IMPORTANT** Do not overfill the system fluid container. Overfilling causes bubbles to form in the fluid lines. **IMPORTANT** **Model 6700 System Fluid**. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
6	Reconnect the system fluid container to the system fluid lines.

Maintaining the Robotic Arm Tips

To maintain the robotic arm tips:

Step	Action
1	Put on appropriate gloves. **⚠ CAUTION** Never touch the robotic arm tips with bare fingers. The oil from your skin will affect the functionality of the 6700 instrument.
2	Check the gold coating of the tips for scratches or bending. **IMPORTANT** If a tip adapter is scratched or bent, call an Applied Biosystems service representative to replace it.
3	Clean the cones and tips with isopropanol. **⚠ WARNING** **CHEMICAL HAZARD**. **Isopropanol** is a flammable liquid and vapor. It may cause eye, skin, and upper respiratory tract irritation. Prolonged or repeated contact may dry skin and cause irritation. It may cause central nervous system effects such as drowsiness, dizziness, and headache, etc. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
4	Tighten loose cones with the white Teflon tip tightener.

Maintaining the Diluter Syringes

To maintain the diluter syringes:

Step	Action
1	Finger-tighten the diluter syringes toward the back of the instrument enclosure. **Note** Turn the diluter syringes toward the right to tighten. **⚠ CAUTION** Do not overtighten the diluter syringes. Overtightening will damage the three-way valve and the diluter syringes.
2	Check the diluter syringes for leaks. **IMPORTANT** If the diluter syringes are leaking, contact an Applied Biosystems service representative to replace the Teflon seals.

Cleaning the Deckspace

To clean the deckspace:

Step	Action
1	Wear appropriate protective clothing, eyewear, and gloves.
2	Apply a germicidal detergent to the deckspace with a squirt bottle, cloth, sponge, or brush. Thoroughly wet the surfaces to be cleaned. For a germicidal detergent we recommend: ♦ Envirocide disinfectant[a] OR ♦ Process Vesphene IIst™ Environmental Disinfectant[b] Prepare each according to package instructions. **⚠ WARNING** **CHEMICAL HAZARD**. **Envirocide disinfectant** may cause eye and skin irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ DANGER** **CHEMICAL HAZARD**. **Process Vesphene IIst Environmental Disinfectant** is corrosive. Exposure may cause eye and skin damage (burns). It is harmful if swallowed. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **IMPORTANT** Do not use bleach. Bleach will damage the aluminum surface. **IMPORTANT** Do not use ethanol or isopropanol in any concentration as a surface disinfectant. Alcohols coagulate proteins and may not work quickly as germicides. Furthermore, due to rapid evaporation, alcohols do not contact open surfaces for adequate time periods. Never use 100% alcohol because it may preserve some microorganisms.
3	Allow the germicidal solution to contact the deckspace surface ≥10 minutes.
4	If necessary, rinse with deionized water.
5	Wipe the surfaces dry.

a. Envirocide disinfectant is available from Viro Research (P/N 30128).

b. Process Vesphene IIst Environmental Disinfectant is available from Steris Corporation at telephone number 1-800-JIT-4-USE (1-800-548-4873) or through their Web site at http://www.steris.com.

Cleaning the Splash Guard Holder

If your protocols use tissue or blood, you may need to clean the splash guard holder.

To clean the splash guard holder:

Step	Action
1	Wear appropriate protective clothing, eyewear, and gloves.
2	Prepare a germicidal detergent such as: ♦ Envirocide disinfectant[a] OR ♦ Process Vesphene IIst Environmental Disinfectant[b] Prepare each according to package instructions. **⚠ WARNING** **CHEMICAL HAZARD**. **Envirocide disinfectant** may cause eye and skin irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ DANGER** **CHEMICAL HAZARD**. **Process Vesphene IIst Environmental Disinfectant** is corrosive. Exposure may cause eye and skin damage (burns). It is harmful if swallowed. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ WARNING** **BIOHAZARD**. Biological samples such as tissues and blood have the potential to transmit infectious diseases. Follow the U.S. Department of Health and Human Services guidelines published in *Biosafety in Microbiological and Biomedical Laboratories* (stock no. 017-040-00547-4) and in Occupational Safety and Health Standards, Toxic and Hazardous Substances (29 CFR §1910.1030) concerning the principles of risk assessment, biological containment, and safe laboratory practices for activities involving clinical specimens. You can obtain additional information by connecting to the government Web site http://www.cdc.gov.
3	Using a 3/32 hex wrench (Allen key), loosen the two screws securing the splash guard holder on either side of the waste position.
4	Remove the splash guard holder and place it in a tray deep enough for soaking it.
5	Pour enough germicidal detergent into the tray to completely cover the splash guard holder.
6	Allow the splash guard holder to soak in the germicidal detergent ≥ 10 minutes.
7	Remove the splash guard holder from the germicidal detergent.
8	Rinse with water.
9	Wipe the splash guard holder dry with a lint-free tissue.
10	Return the splash guard holder to the instrument and tighten the screws to secure it in place.

a. Envirocide disinfectant is available from Viro Research (P/N 30128).

b. Process Vesphene IIst Environmental Disinfectant is available from Steris Corporation at telephone number 1-800-JIT-4-USE (1-800-548-4873) or through their Web site at http://www.steris.com.

Function Tests and Instrument Calibration 6

Overview

About This Chapter This chapter provides procedures for initializing, testing, and calibrating the ABI PRISM™ 6700 Automated Nucleic Acid Workstation.

In This Chapter This chapter contains the following topics:

Topic	See Page
6700 Instrument Initialization	6-2
Instrument Function Tests Overview	6-3
Instrument Function Tests	6-5
Instrument Calibration	6-15

6700 Instrument Initialization

Initialization Requirement

Operation of the 6700 instrument occurs through the ABI PRISM 6700 Automated Nucleic Acid Workstation software. The proper function of the 6700 software requires access to the 6700 database. If access to the 6700 database is blocked for any reason, the 6700 software will not work.

Reporting Firmware Versions and Calibration Values

Note Reporting firmware versions and calibration values requires the Administrator login.

To report firmware versions and calibration values:

Step	Action
1	From the **Instrument** menu, scroll to **Tests** and select **Function Tests**. A **Function Tests** window appears.
2	Select the **Misc Tests** tab. The **Misc Tests** appear.
3	Check the following check boxes: ♦ **Report Firmware Version** ♦ **Report Calibration Values**
4	Click **Start**. a. The instrument initializes. b. The firmware version and instrument calibration values appear in the **Test Log** box. c. The software unchecks the check boxes.
5	Click **Print** to print the **Test Log**.
6	Verify firmware versions.
7	Click **Exit**.

Downloading Firmware

Note Downloading firmware requires the Administrator login.

To download firmware:

Step	Action
1	Close the instrument door.
2	From the **Instrument** menu, scroll to **Utility** and select **Download Firmware**.
3	Click **Choose File**. A **Choose Firmware Download File** dialog box appears.
4	Locate the primary controller firmware: a. Look in the **D** drive on the client computer. b. Find the **pebio** folder, open the **6700** folder, and open the **firmware** folder. c. Select the file **HtspXXXX.abs** to download the primary controller firmware. **Note** Do not select the **GeniXXXX.hex** file, which is the robotic arm firmware. d. Click **Open**.
5	Click **Start**. **Note** Downloading firmware takes approximately 2 minutes.

To download firmware: *(continued)*

Step	Action
6	After the firmware is downloaded, click **Exit**.

Instrument Function Tests Overview

Function Tests Requirement

Instrument function tests are performed through the 6700 software, which requires access to the 6700 database. If access to the 6700 database is blocked for any reason, the 6700 software will not launch.

Function Tests Description

The Function Tests are separated into seven groups, as described in the table below.

Function Test Descriptions

Function Test Group	Test	Test Objective	See Page
Arm Move	Arm Move	♦ The robotic arm can locate a designated deckspace location ♦ The robotic arm can move to a second designated deckspace location	6-5
	Random Arm Move	The robotic arm can move randomly in the X-Y direction well above the deckspace.	6-6
Disposable Tips	Get Disp. Tips	♦ The robotic arm can locate the tip racks and the tip eject bin ♦ The pipette assemblies can sense tips, pick up tips, and eject tips	6-6
	Sense Disp. Tips	♦ The robotic arm can locate the tip racks ♦ The pipette assemblies can sense tips	6-7
Purification	Move Vacuum Station	♦ The purification carriage can move properly ♦ The purification carriage can locate the different vacuum station positions ♦ The carriage can perform touchoff	6-8
	Vacuum	♦ The vacuum functions ♦ The vacuum can maintain intensity for a specified amount of time	6-9
Liquid Detect	Liquid Level Detect	♦ The robotic arm can locate the tip racks and a reagent reservoir ♦ The pipette assemblies can sense tips, pick up tips, and eject tips ♦ The pipette assemblies can sense liquid	6-10
Diluters	Diluters ♦ Diluter 1 ♦ Diluter 2 ♦ Diluter 3 ♦ Diluter 4	♦ The diluters are online and functional ♦ Encoders on the diluters are functioning	6-11

Function Test Descriptions *(continued)*

Function Test Group	Test	Test Objective	See Page
Misc	Report Firmware Version	The instrument components possess the most recent firmware versions	6-2
	Report Calibration Values	The instrument calibration values match the calibration values printed out at installation	6-2
	Test Peltiers	The Peltier units cool certain deckspace stations	6-11
	Cool Peltiers to 4 °C	♦ The Peltier units cool certain deckspace stations to 4 °C ♦ The temperature sensors report accurate deckspace temperatures	6-12
	Test Vacuum Pumps	Both the small and large vacuum pumps function	6-13
	Test Valves	♦ All valves are receiving electrical input ♦ All valves can open and close	6-13
Archive Cover	♦ Test archive cover 1 ♦ Test archive cover 2 ♦ Test archive cover 3	The robotic arm can locate the archive station and transfer an archive cover to a specified archive plate	6-14

Instrument Function Tests

Performing Function Tests: General Instructions

You can access the instrument function tests through the 6700 software. Follow the general instructions below to perform function tests. Read the following sections for parameter descriptions and specific instructions for each test.

To perform function tests:

Step	Action
1	From the **Instrument** menu, scroll to **Tests** and select **Function Tests**. A **Function Tests** window appears.
2	Click a tab to view the tests.
3	Check the box next to the tests you wish to perform.
4	Set the test parameters as described in the following sections.
5	Verify that boxes are checked only next to the tests that you wish to perform.
6	Click **Start** to perform the selected tests. The instrument initializes, performs all checked tests, then unchecks the function test boxes.
7	Print the **Test Log** box by clicking the **Print** button.
8	Click **Exit** to exit the **Function Tests**.

Performing the Arm Move Test

Procedure

To perform the Arm Move test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Arm Move** tab.
3	Check the **Perform 'Arm Move' Test** box.
4	From the **First Destination** pop-up menu, select the first destination for the arm to move to.
5	From the **Second Destination** pop-up menu, select the second destination for the arm to move to.
6	Enter a number from 1 to 999 in the **Repeat** field for the number of times to repeat the test.
7	Click **Start**.

Process

The instrument moves the arm to the First Destination, lowers the tips to the deckspace, moves the arm to the Second Destination, and lowers the tips to the deckspace.

If Failure Occurs

If the arm does not move to the specified destinations, repeat "Calibrating the Deckspace" on page 6-15.

Performing the Random Arm Move Test

Procedure

To perform the Random Arm Move test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Arm Move** tab.
3	Check the **Perform 'Random Arm Move' Test** box.
4	Enter a number from 1 to 999 in the **Repeat** field for the number of times to repeat the test.
5	Click **Start**.

Process

The robotic arm moves randomly in the X-Y axis while it stays at a constant height well above the deckspace. During this random movement, the arm looks for any X and Y positions where the arm binds.

If Failure Occurs

If the robotic arm does not locate positions properly:

- Repeat "Calibrating the Deckspace" on page 6-15.
- Repeat this test.

If failure still occurs after performing the above actions, contact an Applied Biosystems service representative to service the robotic arm.

Performing the Get Disp. Tips Test

Procedure

To perform the Get Disp. Tips test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Disposable Tips** tab.
3	Check the **Perform 'Get Disp. Tips' Test** box.
4	Place a full 200-µL disposable tip rack in the designated tip rack position (1–8). **IMPORTANT** You must always use a full 200-µL disposable tip rack in the tip rack position.
5	From the **Use Tip Rack Position** pop-up menu, select a tip rack that contains disposable tips.
6	Enter a number from 1 to 768 in the **Repeat** field for the number of times to repeat the test. **Note** The number of times to repeat the test is limited by the number of available tips. One full tray is equal to 24 repeats.
7	Check the tips to test in the **Tips To Use** box.
8	Click **Start**.

Process

The robotic arm moves to the designated tip rack and uses the designated tips to pick up the disposable tips. The robotic arm proceeds to eject the tips into the tip eject bin.

If Failure Occurs

If the robotic arm does not get the tips properly, take the following actions:

- Make sure the robotic arm tips are tight.
- Check the white cable that runs from the tips to the robotic arm for crimps or cuts.
- Make sure the tip eject bin is not full and is secured properly.
- Repeat "Calibrating the Deckspace" on page 6-15.
- Repeat this test.

If failure still occurs after performing the above actions, contact an Applied Biosystems service representative to service the robotic arm.

Performing the Sense Disp. Tips Test

Procedure

To perform the Sense Disp. Tips test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Disposable Tips** tab.
3	Check the **Perform 'Sense Disp. Tips' Test** box.
4	Place a full 200-µL disposable tip rack in the designated tip rack position (1–8). **IMPORTANT** You must always use a full 200-µL disposable tip rack in the tip rack position.
5	From the **Use Tip Rack Position** pop-up menu, select a tip rack that contains disposable tips.
6	Enter a number from 1 to 999 in the **Repeat** field for the number of times to repeat the test.
7	Check the tips to test in the **Tips To Use** section of the tab.
8	Click **Start**.

Process

The robotic arm moves to the designated tip rack, then lowers the designated tip to sense whether or not tips are present.

If Failure Occurs

If the robotic arm fails to sense the presence of tips, take the following actions:

- Make sure the robotic arm tips are tight.
- Check the white cable that runs from the tips to the robotic arm for crimps or cuts.
- Repeat "Calibrating the Deckspace" on page 6-15.
- Repeat this test.

Performing the Move Vacuum Station Test

Procedure

To perform the Move Vacuum Station test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Purification** tab.
3	Check the **Perform 'Move Vacuum Station' Test** box.
4	From the **First Destination** pop-up menu, select the first location for the carriage to locate.
5	From the **Second Destination** pop-up menu, select the second location for the carriage to locate.
6	Enter a number from 1 to 999 in the **Repeat** field for the number of times to repeat the test.
7	Check the **Vacuum** box for the vacuum pump to pull a vacuum. **IMPORTANT** If you check the **Vacuum** box, insert a purification tray in the **Second Destination** position, or the vacuum will fail.
8	Check the **Touch Off** box for the carriage to perform touchoff.
9	Click **Start**.

Process

The Vacuum station moves from the First Destination to the Second Destination, then repeats this movement if specified. If selected, the vacuum pump is activated and the Vacuum station performs touchoff.

If Failure Occurs

If the Vacuum station does not move properly, take the following actions:

- Make sure that there are no objects on the deckspace blocking the path of the purification carriage (*e.g.*, stray tips or an archive plate, splash guard, or deep-well plate not fully seated in position).
- Repeat this test after removing any obstructions.

If the vacuum station still fails to move properly, contact an Applied Biosystems service representative.

Performing the Vacuum Test

Procedure

To perform the Vacuum test:

Step	Action
1	Place an empty purification tray in the purification carriage and close the instrument door.
2	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
3	Click the **Purification** tab.
4	Check the **Perform 'Vacuum' Test** box.
5	From the **Vacuum Location** pop-up menu, select the location for the vacuum.
6	From the **Carriage Location** pop-up menu, select the location for the carriage. **Note** If you select a carriage location that is different from the vacuum location, you must place a block on the vacuum location for the vacuum pump to pull a vacuum.
7	Select a value from the **Vacuum Intensity** pop-up menu.
8	Enter a value from 1 to 999 (seconds) in the **Time/secs** field for the length of time to pull a vacuum.
9	Click **Start**.

Process

The vacuum and the carriage move to the designated locations. The vacuum pump attempts to pull a vacuum at the designated vacuum location for the time specified.

If Failure Occurs

- If the vacuum station does not pull sufficient vacuum, take the following actions:
  - Check pumps, valves, and tubing, as described in "Testing Vacuum Pumps" and "Testing Valves" on page 6-13.
  - Check the tightness of the waste container and the vent plug.
  - Check the waste/vacuum lines for pinches.
  - Check the inline filter on the waste/vacuum line for liquid. If the waste was not emptied in a timely manner, the liquid may have flowed into the inline filter. When the inline filter becomes wet, it blocks the filter and prevents the 6700 instrument from pulling a vacuum. Replace the waste/vacuum line (P/N 4326865) if it has become wet.
  - Make sure the vacuum carriage can lower and form an intact seal to the deckspace. Remove any objects preventing intact sealing of the vacuum carriage to the deckspace.
  - Repeat this test.
- If the vacuum pumps do not turn on, take the following actions:
  - Check pumps, valves, and electrical connections (as described in "Testing Vacuum Pumps" and "Testing Valves" on page 6-13).
  - Repeat this test.

If the test fails after performing all of the above actions, test all vacuum positions individually to isolate the problem and contact an Applied Biosystems service representative.

Performing the Liquid Level Detect Test

Procedure

To perform the Liquid Level Detect test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Test**. A **Function Tests** window appears.
2	Click the **Liquid Detect** tab.
3	Check the **Perform 'Liquid Level Detect' Test** box.
4	Select a reagent reservoir to test: a. Place non-deionized water in a reagent reservoir. b. Place the reagent reservoir in any reagent reservoir position. c. From the **Use Reagent** pop-up menu, select the reagent reservoir location that contains water.
5	Select tips to test: a. Place a full 200-µL disposable tip rack in the designated tip rack position (1–8). **IMPORTANT** You must always use a full 200-µL disposable tip rack in the tip rack position. b. From the **Use Tip Rack Position** pop-up menu, select the tip rack that contains disposable tips.
6	Enter a number from 1 to 768 in the **Repeat** field for the number of times to repeat the test. **Note** The number of times to repeat the test is limited by the number of available tips.
7	Check the tips to test in the **Tips To Use** section of the tab.
8	Click **Start**.

Process

The robotic arm moves to the designated tip rack, uses the designated tips to pick up the disposable tips, moves to the designated reagent reservoir, lowers the arm until the tips sense liquid, and proceeds to eject the disposable tips into the tip eject bin.

If Failure Occurs

If the tips do not detect liquid properly, take the following actions:

- Verify that the tips are tight and disposable tips are all positioned properly.
- Check the white cable that runs from the tips to the robotic arm for crimps or cuts.
- Repeat this test.

If the test fails after performing all of the above actions, test each robotic arm tip individually to isolate the problem and contact an Applied Biosystems service representative.

Performing the Diluters Test

Procedure

To perform the Diluters test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Diluters** tab.
3	Check the **Perform 'Diluters' Test** box.
4	Check the box next to the diluters you want to test.
5	Enter a number from 1 to 999 in the **Repeat** field for the number of times to repeat the test.
6	Click **Start**.

Process

The selected diluters initialize, check encoder counts, and check motor function.

If Failure Occurs

If the selected diluters fail to initialize or fail to function, take the following actions:

- Make sure that the diluters are fully seated. Push them toward the back of the instrument.
- Restart the 6700 instrument.
- Restart the 6700 software.
- Repeat this test.

If the test fails after performing the above actions, test each diluter individually to isolate the problem and contact an Applied Biosystems service representative.

Testing Peltiers

Procedure

To test Peltiers:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Misc** tab.
3	Check the **Test Peltiers** box.
4	Noting the time, click **Start**.

Process

The Peltier units cool, then the **Test Log** reports the deckspace temperatures.

If Failure Occurs

If the Peltier units fail to cool, take the following actions:

- Using appropriate personal protective equipment, open the instrument door and touch the Peltier-cooled deckspace stations to see if they are cool. Temperature sensors may malfunction and report inaccurate deckspace temperatures when

condensation forms on the deckspace. In this case, allow time for the temperature sensors to dry before retesting.

- Restart the 6700 instrument.
- Restart the 6700 software.
- Repeat this test.

If the test fails after performing all of the above actions, contact an Applied Biosystems service representative.

Cooling Peltiers to 4 °C

Procedure

To cool Peltiers to 4 °C:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Misc** tab.
3	Check the **Cool Peltiers to 4 °C** box.
4	Place temperature probes in wells within the following deckspace locations: ♦ Input station ♦ Vacuum station: filtrate and archive positions ♦ Dilutions/cDNA station ♦ Standards, Master Mix/Cell Lysate Control station ♦ Output station
5	Click **Start**.

Process

The Peltiers cool to 4 °C, then the **Test Log** reports the deckspace temperatures.

If Failure Occurs

If the Peltier units fail to cool to 4 °C, take the following actions:

- Using appropriate personal protective equipment, open the instrument door and touch the Peltier-cooled deckspace stations to see if they are cool. Temperature sensors may malfunction and report inaccurate deckspace temperatures when condensation forms on the deckspace. In this case, allow time for the temperature sensors to dry before retesting.
- Restart the 6700 instrument.
- Restart the 6700 software.
- Repeat this test.

If the test fails after performing all of the above actions, contact an Applied Biosystems service representative.

Testing Vacuum Pumps

Perform this test if the System Flush test is not flushing the system fluid or if the vacuum pressure is not sufficient to complete a run.

Procedure

To test vacuum pumps:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Misc** tab.
3	Check the **Test Vacuum Pumps** box.
4	Click **Start**.

Process

The small vacuum pump turns on and then off. Then the large vacuum pump turns on and then off. Listen for both pumps to turn on and then off.

If Failure Occurs

Note which pump fails to turn on and off, then contact an Applied Biosystems service representative.

Testing Valves

Perform this test if the vacuum carriage does not move up/down or if the vacuum pressure is not sufficient to complete a run.

Procedure

To test valves:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Misc** tab.
3	Check the **Test Valves** box.
4	Enter a number from 1 to 999 in the **Repeat** field for the number of times to repeat the test.
5	Click **Start**.

Process

All liquid and pressure valves sequentially turn on and then off. Listen for the valves to click on and off. Note any gaps in the sequence.

If Failure Occurs

Note any gaps in the sequence, then contact an Applied Biosystems service representative.

Performing the Archive Cover Test

Procedure

To perform the Archive Cover test:

Step	Action
1	Go to the **Instrument** menu, scroll to **Tests**, and select **Function Tests**. A **Function Tests** window appears.
2	Click the **Archive Cover** tab.
3	Check the **Perform 'Archive Cover' Test** box.
4	Check the boxes next to the archive covers to test.
5	For each archive cover test, select the **Cover Destination** from the pop-up menu.
6	Place plastic consumables on the deckspace: a. Place archive covers in the appropriate positions on the Archive Cover station. b. Place archive plates in the appropriate positions on the deckspace. c. Close the instrument door.
7	Click **Start**.

Process

The robotic arm transfers the archive covers to the designated cover destination and seals the archive plates.

If Failure Occurs

If the robotic arm fails to transfer the archive covers properly, take the following actions:

- Repeat "Calibrating the Deckspace" on page 6-15.
- Make sure the archive covers are placed on the Archive Cover station properly.
- Make sure tips 1 and 4 (*i.e.,* the tips closest and farthest from you) are tightened properly.
- Repeat this test.

If the test fails after performing all of the above actions, then:

- Check for a damaged archive cover.
- Check the Archive Cover station for bending or damage.
- Check tips 1 and 4 (*i.e.,* the tips closest and farthest from you) for bending or damage.
- Note any damage, then contact an Applied Biosystems service representative.

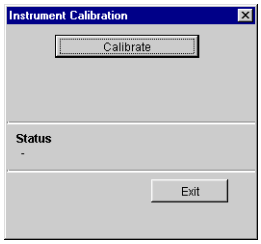
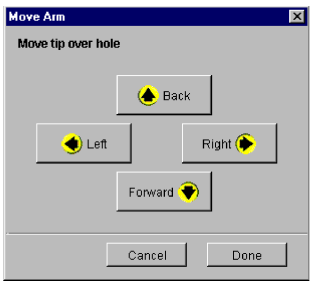
Instrument Calibration

Calibration Requirement

All calibrations are performed through the 6700 software. The proper function of the 6700 software requires access to the 6700 database. If access to the 6700 database is blocked for any reason, the 6700 software will not work.

Calibrating the Deckspace

To calibrate the deckspace:

Step	Action
1	From the **Instrument** menu of the 6700 software, scroll to **Utility** and select **Calibration**. The **Instrument Calibration** dialog box appears. 
2	Make sure that the deckspace is clear: a. Remove the reagent reservoir platform. b. Remove all consumables from the deckspace.
3	Click the **Calibrate** button. ♦ This initializes the instrument. The instrument proceeds with calibrating Deck Z by lowering all four tips to the deck surface next to the Input station. ♦ After the robotic arm completes Deck Z calibration, the instrument proceeds with calibrating Deck X-Y. – The robotic arm moves Tip 1 to the right of the Input 1 position, over the calibration location. (The calibration location is a square hole cut in the deckspace). – The **Move Arm** dialog box appears. 

To calibrate the deckspace: *(continued)*

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Using the mouse, click the arrows on the screen to move the arm until Tip 1 is centered above the calibration location.
The robotic arm moves upward, slightly toward the back of the instrument, and back downward.
The arm lowers Tip 1 to the deck surface and “walks” it toward the front of the instrument until Tip 1 falls into the calibration location.
The robotic arm moves upward, slightly to the right, and back downward.
The arm lowers Tip 1 to the deck surface and “walks” it toward the left until Tip 1 falls into the calibration location.</td></tr>
<tr><td>5</td><td>After the instrument calibrates the location, click Done.
The robotic arm moves to the next calibration location.</td></tr>
<tr><td>6</td><td>Repeat steps 4 through 5 until the robotic arm calibrates all deckspace locations.
Note Deckspace calibration requires about 40 minutes to complete.<table><tr><th>If this is a...</th><th>The calibration positions are...</th></tr><tr><td>96-well instrument</td><td>Output 1
Behind the Output 4 position
At the edge of all three archive cover shelves (elevated above the deckspace)
At the eight disposable tip racks
At four points below the disposable tip racks</td></tr><tr><td>384-well upgrade</td><td>Output 1 at two positions: back left and back right corners
Behind the Output 4 position
Center of well A1
At the edge of all three archive cover shelves (elevated above the deckspace)
At the eight disposable tip racks
At four points below the disposable tip racks</td></tr></table></td></tr>
<tr><td>7</td><td>Click Exit.</td></tr>
</table>

Instrument Decontamination

A

Overview

About This Appendix

If you expose the ABI PRISM™ 6700 Automated Nucleic Acid Workstation to potentially biologically hazardous material (*e.g.*, blood or plasma), you need to contact a certified professional to decontaminate the 6700 instrument enclosure with formaldehyde vapor. This appendix contains the recommended decontamination procedures for the instrument enclosure.

IMPORTANT These decontamination procedures must be performed by a certified professional before an Applied Biosystems service representative can service the instrument.

IMPORTANT This appendix does not provide any decontamination procedures for the instrument enclosure if it contains residual hazardous, nonmicrobiological materials. Remediation of such hazards may require a case-by-case review by a qualified safety professional.

In This Appendix

This appendix contains the following topics:

Topic	See Page
Decontamination Requirements	A-2
Formaldehyde Vapor Decontamination Overview	A-3
Formaldehyde Vapor Decontamination Procedures	A-5

Decontamination Requirements

When to Decontaminate the Instrument

The instrument should be decontaminated if the enclosure has been used with potentially biologically hazardous materials (*e.g.*, blood or plasma) and before any of the following events:

- Repair or replacement of potentially contaminated components
- Relocation
- Decommissioning

Who Can Decontaminate the Instrument

IMPORTANT Execution of the procedures in this appendix should be performed only by adequately trained individuals.

Individuals who perform this decontamination procedure must:

- Know safe handling practices for paraformaldehyde and ammonium bicarbonate
- Have successfully completed a respiratory fitness evaluation for the use of a full-face respirator by a licensed physician within the preceding calendar year
- Be currently listed as a Biohazard Cabinet Field Certifier accredited by the National Sanitation Foundation, International (NSF)

The list of current NSF-Accredited Biohazard Cabinet Certifiers is available at the NSF web site: http//www.nsf.org/.

Formaldehyde Vapor Decontamination Overview

Process Description

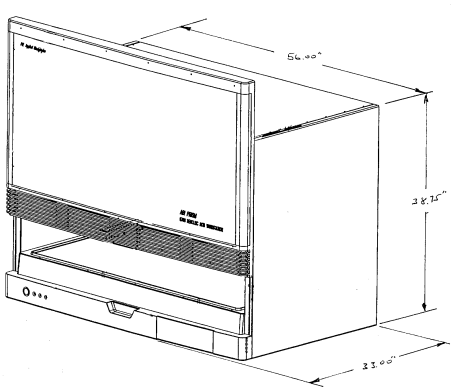
The process of formaldehyde vapor decontamination involves the following stages:

Stage	Process
1	All potentially biologically contaminated work surfaces are isolated and placed under negative pressure with respect to the environment local to the instrument enclosure.
2	All potentially biologically contaminated surfaces in the enclosure are exposed to the following conditions for a minimum of 4 hours: ♦ Formaldehyde vapor at a concentration of 0.3 g per cubic foot (approximately 8000 ppm) ♦ High relative humidity targeted at 70%
3	After the minimum exposure time, the formaldehyde vapor is neutralized using ammonium bicarbonate vapor and/or externally vented.

Definitions

Enclosure

The enclosure is the 6700 instrument cabinet that provides a controlled environment for automation of nucleic acid sample purification and preparation.



Decontamination

Decontamination is the reduction of bioburden on the potentially biologically contaminated surfaces of the enclosure to an acceptable level. This should not be confused with either surface cleaning or sterilization.

Equipment and Supplies Required

Formaldehyde vapor decontamination requires the following equipment and supplies:

Category	Description
Chemicals	♦ 15 g of paraformaldehyde (ACS) ♦ 16 g of ammonium bicarbonate (ACS) ♦ Water
Documents	♦ MSDSs for paraformaldehyde and ammonium bicarbonate ♦ Warning signs ♦ Decontamination labels
Instruments	♦ Temperature and relative humidity meter ♦ Formaldehyde vapor permissible exposure level (PEL) monitor with a detection limit ≤ 0.1 ppm over 4 hours of exposure ♦ Spontaneous formaldehyde vapor sensor with a detection limit ≤ 0.2 ppm
Miscellany	Pen, calculator, and hand tools
Process equipment	♦ Two small evaporator pans ♦ Two electrical extension cords ♦ Plastic sheeting and adhesive tape ♦ Approximately 4 mm of ID tubing for connection to an anemometer ♦ Auxiliary fan ♦ New inline carbon adsorber cell (carbon mass ≥ 1 kg) for the removal of formaldehyde vapor ♦ Ducting, approximately 100 mm of ID tubing for connecting to the air filter and/or auxiliary fan
Safety equipment	♦ Respirator with formaldehyde cartridges ♦ Rubber gloves ♦ Safety glasses ♦ Small dry chemical spill kit

Preliminary Setup

- ♦ Verify the function of the equipment.
- ♦ Verify the scope of work with Safety.
- ♦ Verify the enclosure is available for decontamination with the users.

Chemical Removal

Before beginning this procedure, remove all chemicals from the enclosure that may produce exceptionally toxic or dangerous compounds upon exposure to formaldehyde or ammonium vapors.

Formaldehyde Vapor Decontamination Procedures

Decontamination Overview

Formaldehyde vapor decontamination involves the following procedures:

Topic	See Page
Inspecting the Enclosure	A-5
Preparing the Enclosure	A-5
Sealing the Enclosure	A-6
Generating Formaldehyde Vapor	A-7
Exposing the Enclosure to Formaldehyde Vapor	A-8
Neutralizing the Enclosure	A-8
Ventilating the Enclosure	A-8
Re-establishing Pre-existing Conditions	A-8
Wiping Down the Decontaminated Enclosure	A-9

Inspecting the Enclosure

To inspect the enclosure:

Step	Action
1	Wearing appropriate protective equipment, inspect the enclosure for damage that would indicate a breach of the biohazard containment zone within the enclosure.
2	Record any unexpected damage.
3	If you cannot perform this decontamination procedure safely, notify the users and Safety immediately.

Preparing the Enclosure

To prepare the enclosure:

Step	Action
1	Switch off any controls and place tape over the switches.
2	Place the two small evaporator pans into the enclosure with the power controllers set to ≤ 200 °C (392 °F). The unplugged power cords should be extended outside the enclosure.
3	Label one evaporator pan power cord for paraformaldehyde and the other for ammonium bicarbonate.
4	Measure and record the temperature and relative humidity (rH) within the enclosure. If the temperature is < 15.6 °C (60 °F), then raise the ambient temperature to > 15.6 °C before proceeding.
5	Determine the amount of water required, as follows: **If the relative humidity is...** / **Then...** > 60% / do not add any additional water. < 60% / calculate the amount of water to add using the following equation: Number of grams of water (g) = 0.0055 x (Enclosure Volume (ft^3)) x (70-(ambient %rH)).

To prepare the enclosure: *(continued)*

Step	Action
6	Measure the appropriate amount of water and add it to the paraformaldehyde evaporator pan. Record the actual amount of water used.
7	Place the paraformaldehyde evenly across the corresponding evaporator pan. **⚠ WARNING CHEMICAL HAZARD**. **Paraformaldehyde** is a flammable solid. Exposure causes eye, skin, and respiratory tract irritation. Paraformaldehyde may cause allergic reactions and may be harmful if inhaled or swallowed. It may cause nervous system damage and is a cancer hazard. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
8	Place the ammonium bicarbonate evenly across the corresponding evaporator pan. **⚠ WARNING CHEMICAL HAZARD. Ammonium bicarbonate** may cause eye, skin, and respiratory tract irritation. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

Sealing the Enclosure

To seal the enclosure:

Step	Action
1	Disconnect any exhaust system from the enclosure and cap the system ends.
2	a. Connect the low pressure leg of the gauge to 4 mm of tubing. b. Extend the tubing to lie within the enclosure. c. Place the gauge outside the enclosure where it may be easily seen.
3	a. Close the sash on the enclosure. b. Cover the sash and all openings with plastic sheeting held airtight with adhesive tape.
4	a. Cut a small hole in the plastic sheeting (or exhaust port). b. Attach approximately 100 mm of plastic ducting with adhesive tape so that the only obvious gas exchange between the enclosure and the local environment occurs through the duct.
5	Connect the duct to the inlet side of the adsorber cell.
6	Connect a T-fitting to the outlet side of the adsorber cell.
7	Connect a short length of duct to one of the available ports on the T-fitting and extend the duct to the inlet side of the auxiliary fan.
8	Finish sealing the enclosure, giving special attention to the power cords and anemometer connections.
9	Switch on the auxiliary fan.
10	By controlling the area of the bypass port on the T-fitting and the speed of the auxiliary fan, adjust the differential pressure so that the enclosure is between –.25 mm (–0.01 in.) water column and –.13 mm (–0.005 in.) water column with respect to the adjoining area.

Generating Formaldehyde Vapor

To generate formaldehyde vapor:

Step	Action
1	Place decontamination warning signs with your pager number on the enclosure and by the doorway (primary and secondary containment).
2	a. Activate and affix a PEL monitor badge to the outer face of the enclosure. b. Record the PEL monitor ID and start time.
3	Switch on the paraformaldehyde evaporator pan. **⚠ WARNING CHEMICAL HAZARD**. **Paraformaldehyde** is a flammable solid. Exposure causes eye, skin, and respiratory tract irritation. Paraformaldehyde may cause allergic reactions and may be harmful if inhaled or swallowed. It may cause nervous system damage and is a cancer hazard. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. **⚠ WARNING CHEMICAL HAZARD. Formaldehyde** is harmful if inhaled or swallowed. Exposure to formaldehyde vapors causes eye, skin, and respiratory tract irritation. Formaldehyde may cause allergic reactions and is a cancer hazard. Please obtain and read an MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
4	If the concentration of formaldehyde vapor outside the enclosure increases to ≥ 0.2 ppm at any time: a. Disconnect the paraformaldehyde evaporator pan. b. Switch the ammonium bicarbonate evaporator pan on for the same amount of time as the paraformaldehyde pan. **⚠ WARNING CHEMICAL HAZARD. Ammonium bicarbonate** may cause eye, skin, and respiratory tract irritation. Please read the MSDS and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. c. Proceed immediately to “Ventilating the Enclosure” on page A-8.
5	Observe the evaporator pan until the paraformaldehyde is completely evaporated, then turn off the pan. If the pan is not visible, allow 30 minutes for complete evaporation.

Exposing the Enclosure to Formaldehyde Vapor

To expose the enclosure to formaldehyde vapor:

Step	Action
1	After the paraformaldehyde has evaporated or 30 minutes after switching on the evaporator, record the time.
2	Allow the formaldehyde vapor to contact the surfaces within the enclosure for at least 4 hours. **⚠ WARNING CHEMICAL HAZARD. Formaldehyde** is harmful if inhaled or swallowed. Exposure to formaldehyde vapors causes eye, skin, and respiratory tract irritation. Formaldehyde may cause allergic reactions and is a cancer hazard. Please obtain and read an MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

Neutralizing the Enclosure

To neutralize the enclosure:

Step	Action
1	After the formaldehyde vapor has been allowed to contact the enclosure surfaces for at least 4 hours, switch on the ammonium bicarbonate evaporator pan. **⚠ WARNING CHEMICAL HAZARD. Ammonium bicarbonate** may cause eye, skin, and respiratory tract irritation. Please read the MSDS and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
2	Observe the evaporator pan until the ammonium bicarbonate is completely evaporated. Turn off the pan. If the pan is not visible, allow 30 minutes for complete evaporation.
3	Allow 15 minutes for the two vapors to complex.

Ventilating the Enclosure

To ventilate the enclosure:

Step	Action
1	After neutralization is complete, gradually increase the flow rate and negative pressure within the enclosure. Do this by carefully slitting the plastic covering until the negative pressure remains < 1.3 mm (0.05 in.) water column.
2	Allow the enclosure to vent at this rate for at least 1 hour.

Re-establishing Pre-existing Conditions

To re-establish pre-existing conditions:

Step	Action
1	Record the stop time.
2	Cover and seal the PEL monitor badge.
3	Record the results from the PEL monitor immediately, or when they become available if an outside laboratory is used.
4	Wipe residue, if any, from the immediately accessible work surfaces.

Wiping Down the Decontaminated Enclosure

To eliminate trace residues from the decontaminated enclosure:

Step	Action
1	Monitor and record the concentration of formaldehyde vapor in the enclosure and in the immediate vicinity.
2	Wearing appropriate protective equipment, spray all of the exposed surfaces of the enclosure with a weak ammonia solution at ambient temperature. ⚠ DANGER **CHEMICAL HAZARD. Ammonium hydroxide solution (aqueous ammonia)** causes burns to the eyes, skin, and digestive and respiratory tracts. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
3	Allow a 3-minute contact time.
4	Dry the exposed surfaces thoroughly with lint-free tissues. Discard tissues as chemical waste. ⚠ WARNING Always follow the safety precautions regarding waste in the waste profile. Dispose of the waste in accordance with all local, state, and federal health and environmental regulations and laws.
5	Spray all of the exposed surfaces again using 70% isopropanol (30% deionized water). ⚠ WARNING **CHEMICAL HAZARD**. **Isopropanol** is a flammable liquid and vapor. It may cause eye, skin, and upper respiratory tract irritation. Prolonged or repeated contact may dry skin and cause irritation. It may cause central nervous system effects such as drowsiness, dizziness, and headache, etc. Please read the MSDS, and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.
6	Allow a 10-minute contact time.
7	Dry the exposed surfaces thoroughly with lint-free tissues.
8	Monitor and record the concentration of formaldehyde vapor in the enclosure and in the immediate vicinity.

6700 Workstation Materials

B

Applied Biosystems Materials

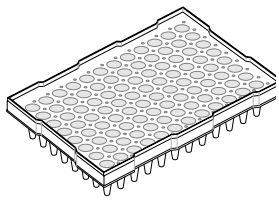
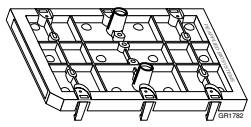
6700 Workstation Materials Overview

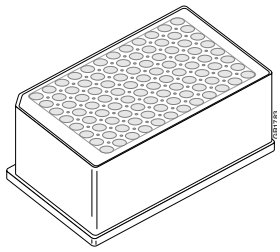
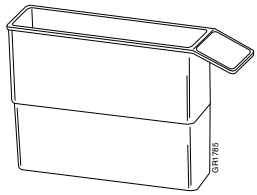
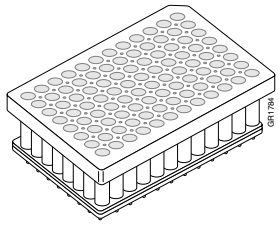
This appendix contains part numbers for the Applied Biosystems reagents and plastic consumables that are designed for preparing nucleic acids on the ABI PRISM™ 6700 Automated Nucleic Acid Workstation.

Reagents

Reagents	P/N
Model 6700 System Fluid	4308456
Nucleic Acid Purification Elution Solution	4305893
Nucleic Acid Purification Lysis Solution	4305895
RNA Purification Wash Solution 1	4305891
RNA Purification Wash Solution 2	4305890

Consumables

Plastic Consumable	Illustration	P/N
MicroAmp® 96-Well Optical Reaction Plate with Barcode		4306737
MicroAmp® 384-Well Optical Reaction Plate with Barcode		4309849
6700 Splash Guards		4311758
Archive Covers		4306286
Conductive Pipette Tips, 1000-µL		4306377
Conductive Pipette Tips, 200-µL		4306375

Plastic Consumable	Illustration	P/N
Deep-well plate		4308641
Disposable Tip Eject Bin Liner (box of five)		4316565
Microcentrifuge Tubes and Caps, 2-mL		4305936
Optical Heat Seal Covers		4307726
Optical Cover Compression Pads		4312639
Reagent Reservoirs, 120-mL		4304831
Reagent Tubes with Caps, 10-mL		4305932
Total RNA Purification Trays		4305673
Waste/vacuum line		4326865

Troubleshooting

C

Overview

About This Appendix

This appendix describes error messages and provides troubleshooting information for the ABI PRISM™ 6700 Automated Nucleic Acid Workstation.

In This Appendix

This appendix contains the following topics:

Topic	See Page
Error Messages and Recoveries in 6700 Software v1.1	C-2

Error Messages and Recoveries in 6700 Software v1.1

Overview

The ABI PRISM™ 6700 Automated Nucleic Acid Workstation software may display the following error messages:

- Tip Not Fetched
- ILID Pulse
- Tip Not Ejected
- Unable to Reach Position/Drive
- Liquid Not Detected

The possible causes (states) for these error messages and the action(s) recommended to recover are discussed in the following sections.

Tip Not Fetched Error

IMPORTANT Wear gloves for these procedures.

⚠ CAUTION Never touch the robotic arm tips (gold) with bare fingers. The oil from your skin will affect the functionality of the 6700 instrument.

Possible Cause(s)	Recommended Action(s)
Incorrect number of tip racks added at the start of the run	a. Open the instrument door. b. Add the correct number of tip racks. c. Remove any remaining disposable tips and raise all robotic arm tips to their maximum height. d. Close the door and click **OK**.
Missing disposable tips in rack	a. Open the instrument door. b. Replace the used rack with a new, full tip rack. c. Remove any remaining disposable tips and raise all robotic arm tips to their maximum height. d. Close the door and click **OK**.
Rack mounted incorrectly	a. Open the instrument door. b. Replace the used rack with a new, full tip rack. Make sure the rack is correctly seated. c. Remove any remaining disposable tips and raise all robotic arm tips to their maximum height. d. Close the door and click **OK**.
Loose robotic arm tips	a. Open the instrument door. b. Replace the rack currently in use with a new, full tip rack. c. Remove any remaining disposable tips from the robotic arm. d. Tighten the robotic arm tips with the white Teflon tip tightener. e. Raise all robotic arm tips to their maximum height. f. Close the door and click **OK**.

ILID Pulse Error

The ILID pulse is the electronic signal that informs the 6700 instrument that a tip has been properly mounted.

IMPORTANT Wear gloves for these procedures.

⚠ CAUTION Never touch the robotic arm tips (gold) with bare fingers. The oil from your skin will affect the functionality of the 6700 instrument.

Possible Cause(s)	Recommended Action(s)
A **Tip Not Fetched** error had already occurred. The user clicked **OK** without fixing the problem(s).	a. Open the instrument door. b. Check that the correct number of racks and tips are correctly mounted. c. Check that the tip eject bin is empty and secured to the deckspace. d. Remove any remaining disposable tips. e. Tighten the robotic arm tips with the white Teflon tip tightener. f. Replace the rack currently in use with a new, full tip rack. g. Raise all robotic arm tips to their maximum height. h. Close the door and click **OK**.

Tip Not Ejected Error

IMPORTANT Wear gloves for these procedures.

⚠ CAUTION Never touch the robotic arm tips (gold) with bare fingers. The oil from your skin will affect the functionality of the 6700 instrument.

<table>
<tr><th>Possible Cause(s)</th><th>Recommended Action(s)</th></tr>
<tr><td>Tip incompletely ejected from the robotic arm</td><td>a. Open the instrument door.
b. Manually remove the tip.
c. Check that the tip eject bin is empty and secured to the deckspace.
d. Tighten the robotic arm tips with the white Teflon tip tightener.
e. Raise all robotic arm tips to their maximum height.
f. Close the door and click OK.

Note If this error continues to occur or if all the tips did eject properly, the instrument may have a damaged tip mount switch. See “Damaged tip mount switch” below.</td></tr>
<tr><td>Damaged tip mount switch</td><td>Test the tip mount switch by running the Get Disp. Tips function test (see page 6-6 for instructions).

IMPORTANT Test each individual tip while watching for problems (12 ejections/tip).

<table><tr><th>If the error message comes up even though all tips eject properly...</th><th>If one or more tips continue to eject incompletely...</th></tr><tr><td>Call your Applied Biosystems service representative.</td><td>See “Loose reagent reservoir/tip eject holder unit” on page C-4.</td></tr></table></td></tr>
</table>

Possible Cause(s)	Recommended Action(s)
Loose reagent reservoir/tip eject plate **Note** If this is loose, the whole reagent reservoir assembly lifts as the tip ejects.	a. Tighten the captive screw securing the front of the tip eject plate. b. Adjust the height of the setscrew at the back of the tip eject plate (the adjustment may have altered over time). The tip eject plate is secure if it no longer moves when the tips eject. **Note** If you cannot adjust the screws or secure the tip eject plate, call your Applied Biosystems service representative.

Unable to Reach Position/Drive Error

This error displays when the robotic arm is unable to reach a position, or when the 6700 instrument cannot detect that the position has been reached.

<table>
<tr><th>Possible Cause(s)</th><th>Recommended Action(s)</th></tr>
<tr><td>The robotic arm's torque sensor has been tripped. This sensor prevents damage to the arm by pausing when there is too much pressure on the arm as it moves between positions</td><td>a. Open the instrument door.
b. Close the door and click OK to resume the run.

Note If this error continues to occur, call your Applied Biosystems service representative.</td></tr>
<tr><td>Damage to the tip mount switch caused the robotic arm to increase its height beyond its maximum[a]</td><td>
<table>
<tr><th>If the arm is...</th><th>Then...</th></tr>
<tr><td>over the eject position and the tip has ejected correctly</td><td>a. open the instrument door.
b. Close the door and click OK to resume the run.</td></tr>
<tr><td>over the eject position but the tip has not ejected correctly</td><td>a. open the instrument door.
b. Remove the disposable tips.
c. Tighten the robotic arm tips.
d. Raise all tips to their maximum height.
e. Close the door and click OK to resume the run.</td></tr>
</table>
Note If this error occurs again at the next tip eject, abort the run and call your Applied Biosystems service representative.
</td></tr>
<tr><td>Racks are set at incorrect height due to incorrect instrument calibration</td><td>a. Abort the run.
b. Recalibrate the 6700 instrument. See “Instrument Calibration” on page 6-15 for instructions.
c. Restart the run.

Note If this error continues to occur, run the Get Disp. Tips Test to check the tip mounting/ejection function. See page 6-6 for instructions.</td></tr>
</table>

Possible Cause(s)	Recommended Action(s)
Liquid in the primary input position is highly viscous	See “Liquid Not Detected Error” on page C-5.

a. If the tip mount switch is broken, the 6700 instrument will not be able to detect when the tips have ejected. The robotic arm will increase its height as it continues to try ejecting tips. Once beyond the maximum height, the torque sensor shuts down power to the arm.

Liquid Not Detected Error

IMPORTANT Wear gloves for these procedures.

⚠ CAUTION Never touch the robotic arm tips (gold) with bare fingers. The oil from your skin will affect the functionality of the 6700 instrument.

<table>
<tr><th>Possible Cause(s)</th><th>Recommended Action(s)</th></tr>
<tr><td>Insufficient liquid in a position (e.g., master mix)</td><td>a. Open the instrument door.
b. Raise all tips to their maximum height.
c. Determine which position is low:

<table><tr><th>If you...</th><th>Then...</th></tr><tr><td>do not know which position is low</td><td>♦ close the door and click OK to resume the run.
♦ Let the error happen again and note which position is low.
♦ Open the instrument door.
♦ Raise all tips to their maximum height.
♦ Continue with step d.</td></tr><tr><td>do know which position is low</td><td>continue with step d.</td></tr></table>
d. Add the appropriate liquid to the position.
e. Close the door and click OK to resume the run.</td></tr>
<tr><td>Liquid in the primary input position is highly viscous</td><td>a. Retry the liquid detection. These errors can be generated intermittently.
b. If the error occurs multiple times, abort the run and do one of the following:
♦ Dilute the solution 1:1 or higher with 1X buffer (to reduce viscosity). OR
♦ Set the number of mixes to 0 (zero) in the Lysis protocol or RNA/DNA Archive protocol. Ensure that the lysate is thoroughly mixed before processing. To do this, hand-mix the samples at least three times with a multi-channel pipette. OR
♦ Check the High Viscosity Box in the RNA/DNA Archive protocol.</td></tr>
</table>

What Causes High Viscosity

For certain cell lines, adding total RNA lysis reagent to cell counts >1x10^6 cells per well results in a highly viscous lysate with the consistency of honey. The high viscosity is the result of the complete lysis of cells, with the release of genomic DNA (gDNA) into solution. The high efficiency of the lysis solution makes this phenomenon occur at cell counts and volumes of lysate not typically seen with other reagents.

In addition, cell lines with higher ploidy may show this phenomenon at a lower cell count, due to the higher concentration of gDNA. Tetraploid HeLa cells, for example, have twice as much gDNA per cell.

Cell Lines More Likely to Become Highly Viscous

This phenomenon has been noted for the following cell lines and concentrations:

- Human Raji cells at ≥1x10^7 cells/well
- HeLa cells at approximately ≥5x10^6 cells/well
- U937 cells at approximately ≥1x10^6 cells/well

Impact of High Viscosity Liquids

The 6700 instrument uses the change in capacitance between air and liquid to sense when the tip reaches a liquid surface. Viscous liquid can leave adherent strings of material on the tips. The physical connection between the liquid on the tip and the liquid in the well prevents the instrument from sensing the capacitance change.

This happens more frequently if mixing is set to anything other than 0 (zero) in the Lysis protocol or RNA/DNA Archive protocol, since the strings of material are drawn up with the tip after the last mix step. If the change in capacitance cannot be sensed, the tip drives to the bottom of the well, triggering the Liquid Not Detected error or Unable to Reach Position error.

References D

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, and National Institutes of Health. 1999. *Biosafety in Microbiological and Biomedical Laboratories, 4th ed*. Richmond, J.Y. and McKinney, R.W., eds. Washington, DC: U.S. Government Printing Office. For sale by the Superintendent of Documents, U.S. Government Printing Office. Stock no. 017-040-00547-4.

Technical Support

E

Contacting Technical Support

You can contact Applied Biosystems for technical support:

- By e-mail
- By telephone or fax
- Through the Applied Biosystems web site

You can order Applied Biosystems user documents, MSDSs, certificates of analysis, and other related documents 24 hours a day. In addition, you can download documents in PDF format from the Applied Biosystems web site (please see the section "To Obtain Technical Documents" following the telephone information below).

To Contact Technical Support by E-Mail

To contact Applied Biosystems Technical Support by e-mail for help in the following product areas:

Product/Product Area	E-mail address
Genetic Analysis (DNA Sequencing)	galab@appliedbiosystems.com
Sequence Detection Systems and PCR	pcrlab@appliedbiosystems.com
Protein Sequencing, Peptide, and DNA Synthesis	corelab@appliedbiosystems.com
Biochromatography PerSeptive DNA, PNA and Peptide Synthesis systems FMAT™ 8100 HTS System CytoFluor® 4000 Fluorescence Plate Reader Mariner™ Mass Spectrometers Voyager™ Mass Spectrometers MassGenotyping Solution 1™ (MGS1) System	tsupport@appliedbiosystems.com
LC/MS (Applied Biosystems/MDS Sciex)	support@sciex.com
Chemiluminescence (Tropix)	tropix@appliedbiosystems.com

To Contact Technical Support by Telephone or Fax (North America)

To contact Applied Biosystems Technical Support in North America, use the telephone or fax numbers in the table below.

Note *To schedule a service call for other support needs, or in case of an emergency, dial **1.800.831.6844**, then press **1**.*

Product/Product Area	Telephone	Fax
ABI PRISM® 3700 DNA Analyzer	**1.800.831.6844**, then press **8**[a]	1.650.638.5981
DNA Synthesis	**1.800.831.6844**, press **2**, then press **1**[a]	1.650.638.5981
Fluorescent DNA Sequencing	**1.800.831.6844**, press **2**, then press **2**[a]	1.650.638.5981
Fluorescent Fragment Analysis (including GeneScan® applications)	**1.800.831.6844**, press **2**, then press **3**[a]	1.650.638.5981
Integrated Thermal Cyclers (ABI PRISM® 877 and Catalyst 800 instruments)	**1.800.831.6844**, press **2**, then press **4**[a]	1.650.638.5981
ABI PRISM® 3100 Genetic Analyzer	**1.800.831.6844**, press **2**, then press **6**[a]	1.650.638.5981
Peptide Synthesis (433 and 43x Systems)	**1.800.831.6844**, press **3**, then press **1**[a]	1.650.638.5981
Protein Sequencing (Procise® Protein Sequencing Systems)	**1.800.831.6844**, press **3**, then press **2**[a]	1.650.638.5981
PCR and Sequence Detection	**1.800.762.4001**, then press: **1** for PCR[a] **2** for TaqMan® applications and Sequence Detection Systems including ABI Prism, 7700, 7900, and 5700[a] **6** for the 6700 Automated Sample Prep System[a] or **1.800.831.6844**, then press **5**[a]	1.240.453.4613
Voyager™ MALDI-TOF Biospectrometry Workstations Mariner™ ESI-TOF Mass Spectrometry Workstations MassGenotyping Solution 1™ (MGS1) System	**1.800.899.5858**, press **1**, then press **3**[b]	1.508.383.7855
Biochromatography (BioCAD®, SPRINT™, VISION™, and INTEGRAL® Workstations and POROS® Perfusion Chromatography Products)	**1.800.899.5858**, press **1**, then press **4**[b]	1.508.383.7855
Expedite™ Nucleic Acid Synthesis Systems	**1.800.899.5858**, press **1**, then press **5**[b]	1.508.383.7855

Product/Product Area	Telephone	Fax
Peptide Synthesis (Pioneer™ and 9050 Plus Peptide Synthesizers)	**1.800.899.5858**, press **1**, then press **5**[b]	1.508.383.7855
PNA Custom and Synthesis	**1.800.899.5858**, press **1**, then press **5**[b]	1.508.383.7855
FMAT™ 8100 HTS System CytoFluor® 4000 Fluorescence Plate Reader	**1.800.899.5858**, press **1**, then press **6**[b]	1.508.383.7855
Chemiluminescence (Tropix)	**1.800.542.2369** (U.S. only), or **1.781.271.0045**[c]	1.781.275.8581
LC/MS (Applied Biosystems/MDS Sciex)	**1.800.952.4716**	1.508.383.7899

a. 5:30 A.M. to 5:00 P.M. Pacific time.

b. 8:00 A.M. to 6:00 P.M. Eastern time.

c. 9:00 A.M. to 5:00 P.M. Eastern time.

To Contact Technical Support by Telephone or Fax (Outside North America)

To contact Applied Biosystems Technical Support or Field Service outside North America, use the telephone or fax numbers below.

Region	Telephone	Fax
Eastern Asia, China, Oceania		
Australia (Scoresby, Victoria)	**61 3 9730 8600**	**61 3 9730 8799**
China (Beijing)	**86 10 64106608** or **86 800 8100497**	**86 10 64106617**
Hong Kong	**852 2756 6928**	**852 2756 6968**
India (New Delhi)	**91 11 653 3743/3744**	**91 11 653 3138**
Korea (Seoul)	**82 2 593 6470/6471**	**82 2 593 6472**
Malaysia (Petaling Jaya)	**60 3 79588268**	**60 3 79549043**
Singapore	**65 896 2168**	**65 896 2147**
Taiwan (Taipei Hsien)	**886 2 2358 2838**	**886 2 2358 2839**
Thailand (Bangkok)	**66 2 719 6405**	**66 2 319 9788**
Europe		
Austria (Wien)	**43 (0)1 867 35 75 0**	**43 (0)1 867 35 75 11**
Belgium	**32 (0)2 532 4484**	**32 (0)2 582 1886**
Denmark (Naerum)	**45 45 58 60 00**	**45 45 58 60 01**
Finland (Espoo)	**358 (0)9 251 24 250**	**358 (0)9 251 24 243**
France (Paris)	**33 (0)1 69 59 85 85**	**33 (0)1 69 59 85 00**
Germany (Weiterstadt)	**49 (0)6150 101 0**	**49 (0)6150 101 101**
Italy (Milano)	**39 (0)39 83891**	**39 (0)39 838 9492**
Norway (Oslo)	**47 23 12 06 05**	**47 23 12 05 75**
Portugal (Lisboa)	**351.(0)22.605.33.14**	**351.(0)22.605.33.15**

Region	Telephone	Fax
Spain (Tres Cantos)	**34.(0)91.806.1210**	**34.(0)91.806.12.06**
Sweden (Stockholm)	**46 (0)8 619 4400**	**46 (0)8 619 4401**
Switzerland (Rotkreuz)	**41 (0)41 799 7777**	**41 (0)41 790 0676**
The Netherlands (Nieuwerkerk a/d IJssel)	**31 (0)180 392400**	**31 (0)180 392409** or **31 (0)180 392499**
United Kingdom (Warrington, Cheshire)	**44 (0)1925 825650**	**44 (0)1925 282502**

European Managed Territories (EMT)		
Africa, English speaking (Johannesburg, South Africa)	**27 11 478 0411**	**27 11 478 0349**
Africa, French speaking (Paris, France)	**33 1 69 59 85 11**	**33 1 69 59 85 00**
India (New Delhi)	**91 11 653 3743** **91 11 653 3744**	**91 11 653 3138**
Poland, Lithuania, Latvia, and Estonia (Warszawa)	**48 22 866 40 10**	**48 22 866 40 20**
For all other EMT countries not listed (Central and southeast Europe, CIS, Middle East, and West Asia)	**44 1925 282481**	**44 1925 282509**
Japan		
Japan (Hacchobori, Chuo-Ku, Tokyo)	**81 3 5566 6230**	**81 3 5566 6507**
Latin America		
Caribbean countries, Mexico, and Central America	**52 55 35 3610**	**52 55 66 2308**
Brazil	**0 800 704 9004** or **55 11 5070 9654**	**55 11 5070 9694/95**
Argentina	**800 666 0096**	**55 11 5070 9694/95**
Chile	**1230 020 9102**	**55 11 5070 9694/95**
Uruguay	**0004 055 654**	**55 11 5070 9694/95**

To Reach Technical Support Through the Applied Biosystems Web Site

To contact Technical Support through the Applied Biosystems web site:

Step	Action
1	Go to **http://www.appliedbiosystems.com**
2	Click **SERVICES & SUPPORT** at the top of the page, then click **Frequently Asked Questions**.
3	Click **Contact Support** in the contents list at the left of the screen.
4	Click your geographic region for the product area of interest.
5	In the Personal Assistance form, enter the requested information and your question, then click **Ask Us RIGHT NOW**.

To contact Technical Support through the Applied Biosystems web site: *(continued)*

Step	Action
6	In the Customer Information form, enter the requested information, then click **Ask Us RIGHT NOW**. Within 24 to 48 hours, you will receive an e-mail reply to your question from an Applied Biosystems technical expert.

To Obtain Technical Documents

You can obtain technical documents, such as Applied Biosystems user documents, MSDSs, certificates of analysis, and other related documents for free, 24 hours a day. You can obtain documents:

- By telephone
- Through the Applied Biosystems web site

Ordering Documents by Telephone

To order documents by telephone:

1	From the U.S. or Canada, dial **1.800.487.6809**, or from outside the U.S. and Canada, dial **1.858.712.0317**.
2	Follow the voice instructions to order documents (for delivery by fax). **Note** There is a limit of five documents per fax request.

Obtaining Documents Through the Web Site

To view, download, or order documents through the Applied Biosystems web site:

Step	Action
1	Go to **http://www.appliedbiosystems.com**
2	Click **SERVICES & SUPPORT** at the top of the page, then click **Documents on Demand**.
3	In the search form, enter and select search criteria, then click **Search** at the bottom of the page.
4	In the results screen, do any of the following: ♦ Click the pdf icon to view a PDF version of the document. ♦ Right-click the pdf icon, then select **Save Target As** to download a copy of the PDF file. ♦ Select the **Fax** check box, then click **Deliver Selected Documents Now** to have the document faxed to you. ♦ Select the **Email** check box, then click **Deliver Selected Documents Now** to have the document (PDF format) e-mailed to you. **Note** There is a limit of five documents per fax request, but no limit on the number of documents per e-mail request.

To Obtain Customer Training Information

To obtain Applied Biosystems training information:

Step	Action
1	Go to **http://www.appliedbiosystems.com**
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Glossary

archive plate Plate that contains nucleic acid purified or diluted by the ABI PRISM™ 6700 Automated Nucleic Acid Workstation.

archive cover Plastic consumable that seals archive plates for long-term storage.

Assay output plates Plate prepared by the 6700 workstation that contains Master Mixes, standards, controls, and samples from an RNA archive, DNA archive, cDNA archive, or Dilution archive plate. Assay output plates can be used for a variety of applications, including standard curve analysis, comparative quantification, allelic discrimination, plus/minus analysis, and custom analysis.

Assay protocol 6700 workstation protocol to prepare up to four Assay output plates containing Master Mixes, standards, controls, and samples from an RNA archive, DNA archive, cDNA archive, or Dilution archive plate.

Assay wizard 6700 system software tool for creating Assay protocols.

cDNA archive plate Plate that contains cDNA prepared by the 6700 workstation.

cDNA Archive protocol 6700 workstation protocol to reverse transcribe cDNA from RNA by mixing RNA and reverse transcription master mix together in a cDNA archive plate and then heating the plate for reverse transcription.

Consumable ID Barcode label on Applied Biosystems consumables.

deckspace A 1.17 x 0.43-m (46 x 17-in.) plate within the 6700 instrument that holds samples, reagents, plastic consumables, and waste for automated protocols.

detector A nucleic acid probe in a master mix used for standard curve analysis, comparative quantification, allelic discrimination, plus/minus analysis, or custom analysis. Detectors contain a reporter dye and a quencher dye.

diluters Control the volume and rate of liquid aspiration and dispensing by the robotic arm tips.

Dilution archive plate Plate that contains nucleic acid diluted by the 6700 workstation.

Dilution Archive protocol 6700 workstation protocol to perform up to two serial dilutions of an RNA archive, DNA archive, or cDNA archive plate.

DNA archive plate Plate that contains DNA purified by the 6700 workstation.

DNA Archive protocol 6700 workstation protocol to purify DNA from DNA precipitate.

DNA Precipitation protocol 6700 workstation protocol to precipitate DNA.

dye Fluorescent marker on the detectors.

elution The process of displacing nucleic acid from the purification tray filter by adding solvent (*e.g.*, elution solution).

filtrate Sample solution that flows through the purification tray filter.

Lysis protocol 6700 workstation protocol to lyse cells by mixing cells with lysis solution.

optical heat seal cover Covers designed to seal Assay output plates.

Peltier units Used to cool the Input station; Standards, Master Mix/Cell Lysate Control station; Dilutions/cDNA station; and Output station to 4 °C.

RNA archive plate Plate containing RNA purified by the 6700 workstation.

RNA Archive protocol 6700 workstation protocol to purify RNA from lysed cells.

RT master mix Solution that contains reverse transcriptase, nucleotides, and other components required to reverse transcribe cDNA from RNA.

sample types Define the samples in an Assay protocol. Default sample types include buffer, internal positive control I (IPC+), internal positive control II (IPC–), no amplification control (NAC), no probe control (NPC), no template control (NTC), standard (STND), and unknown (UNKN).

touchoff Movement of the purification tray carriage to release drops from the purification tray into filtrate, archive, and waste positions.

viscosity The state of fluid cohesiveness and consistency. For example, water is a low-viscosity liquid and glycerol is a high-viscosity liquid.

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