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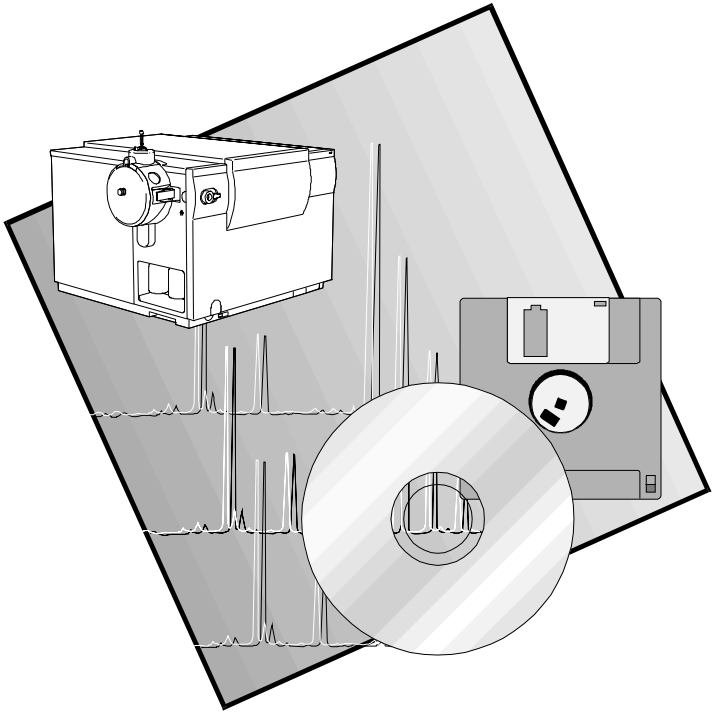

HP 1100 Series
LC/MSD

System Installation Manual

Document History

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Warranty

The information contained in this document is subject to change without notice.

Hewlett-Packard makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

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Hewlett-Packard assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Hewlett-Packard.

Instrument Identification

Each HP 1100 Series LC/MSD is identified by a unique 10-character serial number. This serial number is located on a label on the lower right front corner of the instrument.

When corresponding with Hewlett-Packard about your instrument, be sure to include the model number and the full 10-character serial number.

The HP G1947A APCI Interface and HP G1948A Electrospray Interface each have separate serial numbers. These numbers are located next to the spray chamber latches.

Write the serial numbers of your HP 1100 Series LC/MSD and interfaces here for reference:

LC/MSD Serial #:

_____

APCI Interface Serial #:

_____

Electrospray Interface Serial #:

_____

Manual Conventions

Cautions

Cautions call attention to procedures that, if not correctly performed or adhered to, could result in ***damage to the instrument***.

Warnings

Warnings call attention to procedures that, if not correctly performed or adhered to, could result in ***personal injury***.

Part Numbers

In this manual, Hewlett-Packard part numbers are generally listed in parentheses after the name of the part (or in lists or pop-ups on the maintenance CD-ROM.) Most Hewlett-Packard part numbers are either four-digit-by-four-digit (1234-1234) numbers or five-digit-by-five-digit (12345-12345) numbers.

A few tools and supplies listed have no part numbers and are not available from Hewlett-Packard. Most of these can be obtained from laboratory supply companies.

Safety Symbols


Refer to operating instructions


Indicates hazardous voltage


Indicates hot surface


Indicates earth (ground) terminal

Table of Contents

1

General Information

Before You Begin

This manual describes the installation of an HP 1100 Series LC/MSD system. This process is outlined as a sequence of steps.

Several options and accessories are included in this manual. They are presented in the recommended order of installation. Disregard the sections that do not apply to a specific instrument configuration.

The following installation instructions are intended for on-site installation by a trained HP Customer Engineer.

Additional information is available in the *HP 1100 Series LC/MSD Site Preparation Manual* (HP part number G1946-90050).

Installation of an LC/MSD system includes the following steps:

1 **Inspection of shipped materials**

2 **Data system installation**

3 **LC/MSD installation**

4 **LC installation and preparation**

5 **Performance evaluation**

6 **Customer familiarization**

NOTE Checkout and tuning samples are shipped separately, to comply with safety regulations and to ensure prompt delivery. Make sure these samples have been stored correctly, per the instructions in the box.

Customer Responsibilities

The following are ***not*** included in the standard installation. They are the responsibility of the customer unless previous arrangements have been made between the customer and the Hewlett-Packard Customer Service Organization.

- Preparation of all site facilities including the provision of adequate space, supporting bench, ventilation and ac power as stated in the *HP 1100 Series LC/MSD Site Preparation Manual* (part number G1946-90050).
- Operating supplies: syringes, vials, and solvents.
- Nitrogen gas: the LC/MSD requires a large quantity of contaminant-free nitrogen gas. HP recommends that the nitrogen source be either a nitrogen generator or a large (160 liter or greater) dewar of liquid nitrogen. For additional information on nitrogen gas requirements, see the *HP 1100 Series LC/MSD Site Preparation Manual* (part number G1946-90050).

W A R N I N G **Nitrogen is the *only* acceptable drying and nebulizing gas. Use of air, oxygen, or other gases, when combined with solvents and high voltages in the spray chamber, could result in explosion.**

N O T E Solvents that are acceptable for most LC applications may contain unacceptably high levels of background contaminants detectable by the more-sensitive LC/MSD. Ideally, LC solvents used with the LC/MSD should be rated for both HPLC and pesticide, environmental, or GC/MS analyses. Use the highest purity solvents you can obtain. Acceptability of solvents for a specific application must be *empirically* determined.

- Separate vents for pump exhaust and spray chamber waste
- Secondary containment containers for the drain bottle and the foreline pump
- Testing, modification, and/or repair of instruments not purchased as part of the HP 1100 LC/MSD system
- Operational training for programs not specifically listed in this document
- Tests using customer-supplied samples or equipment
- Any tasks not described in this manual

In addition, the customer is required to:

- Provide someone to help lift the LC/MSD (61.4 kg) onto the bench
- Have the primary user present during installation and familiarization

Other Documentation

Additional information is contained in the following documentation:

- *HP 1100 Series LC/MSD Maintenance and Reference* CD-ROMs
- Hardware reference online help
- HP LC/MSD ChemStation online help
- HP 1100 Series LC manuals, maintenance CD-ROM, and online help
- Computer installation manuals
- Computer peripheral manuals (printer, backup drives, and so on)
- Windows NT® 4.0 manual and online help

This installation manual is intended to be used in combination with these other resources. Many steps in this manual are explained in detail elsewhere, and the appropriate resource should be consulted if you are not sure of how to perform a particular step.

Web-Based Product Update News

For the most current information on the HP ChemStation software, point your web browser to HP web site at **http://www.hp.com/go/chem**. Look under **Service and Support** for **Software Status Bulletins and Patches**. You need your product registration number to access the **Software Status Bulletins** (SSB) site.

Warranty

Hewlett-Packard (HP) warrants its Analytical products against defects in materials and workmanship for the warranty period. During the warranty period, HP, at its option, repairs or replaces products that prove to be defective. Products that are installed by HP are warranted from the installation date; all others are warranted from the date of delivery.

If Buyer schedules or delays installation more than 30 days after delivery, then warranty period starts on 31st day from the date of shipment. For international orders, the grace period is 60 days, and the warranty period starts on the 61st day from the date of shipment.

HP software and firmware products that are designated by HP for use with a hardware product, when properly installed on that hardware product, are warranted not to fail to execute their programming instructions due to defects in materials and workmanship. If HP receives notice of such defects during the warranty period, HP shall repair or replace software media and firmware that do not execute their programming instructions due to such defects. HP does not warrant that the operation of the software, firmware, or hardware shall be uninterrupted or error free.

Within HP service travel areas, warranty and installation services for products installed by HP and certain other products designated by HP are performed at Buyer's facility at no charge. For installation and warranty services outside of HP's service travel area, HP provides a quotation for the applicable additional services.

The foregoing warranty shall not apply to defects resulting from:

- Improper or inadequate maintenance, adjustment, calibration, or operation by Buyer
- Buyer-supplied software, hardware, interfacing, or consumables
- Unauthorized modifications or misuse
- Operation outside of the environmental and electrical specifications for the product
- Improper site preparation and maintenance
- Customer-induced contamination or leaks

This warranty may be modified in accordance with the laws of your country. Please consult your local HP office for the period of the warranty, for shipping instructions, and for the applicable wording of the local warranty.

Warranty Claims

If physical damage is found, or if operation is not as specified when the instrument is first received, notify the carrier and the nearest Hewlett-Packard office immediately. The HP office arranges for repair or replacement of the instrument without waiting for settlement of a claim with the carrier. For other than initial inspection warranty claims, contact your local HP office.

Service Agreements

Several service agreements are available, each designed to meet a specific need. In addition to a preventive maintenance agreement, others cover specific repair/maintenance services for the HP 1100 Series LC/MSD and can provide for the extension of warranty beyond the initial warranty period.

Details of these agreements, together with prices applicable to the particular installation, can be obtained from your local Hewlett-Packard office.

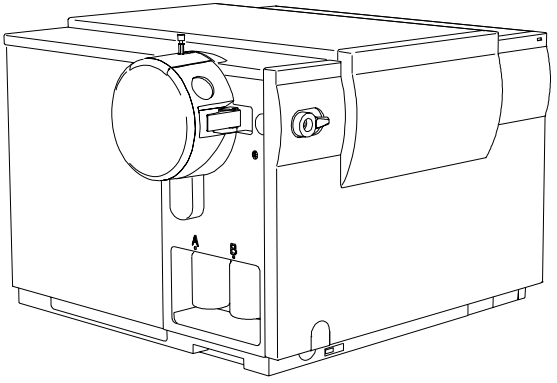
2

Installation

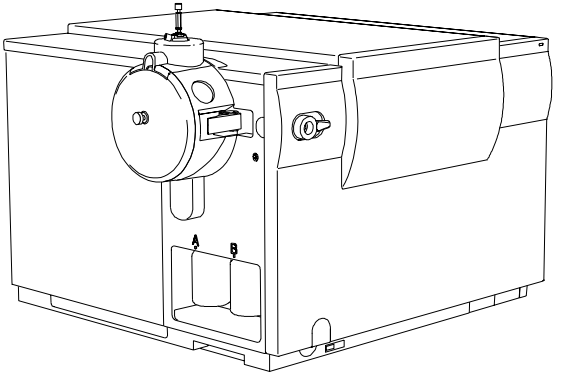
Installing the LC/MSD

Installing the LC/MSD requires the following steps:

- Unpacking and Setup
- Preparing for Installation
- Connecting the LC/MSD
- Installing the Spray Chamber
- Installing the LC
- Baking Out the LC/MSD (after ChemStation Installation)



LC/MSD with electrospray interface



LC/MSD with APCI interface

Unpacking and Setup

Use the following procedure to unpack and set up the HP 1100 Series LC/MSD system.

NOTE Shipping containers should not be opened until a Hewlett-Packard (HP) representative is present to verify the contents of each carton. Warranty claims for missing items are honored only if an HP representative is on site to verify the contents of each shipping container as it is unpacked.

NOTE Checkout and tuning samples are shipped separately to comply with safety regulations and to ensure prompt delivery. Make sure these samples have been stored correctly, per the instructions in the box.

1 **Before unpacking, carefully examine all containers for external signs of damage.**

If damage is discovered, immediately contact the carrier, the HP Service District Manager (DM), and the California Analytical Division Technical Support group.

2 **Check off each item on the packing list, and verify the serial numbers.**

3 **Record the serial numbers in the installation documentation.**

4 **Retain shipping containers and material until contents are checked for completeness and instrument performance is verified.**

5 **Report any discrepancies to the supplying division.**

6 **Check the line voltage.**

Verify the proper line voltage and outlet ratings according to the instructions given in the *HP 1100 Series LC/MSD Site Preparation Manual* (part number G1946-90050).

Preparing for Installation

Materials Needed:

- Edwards mist filter instructions
- Edwards oil drain kit instructions
- Oil return connector kit, Edwards part number A504-20-000
- Pump oil pan, G1946-00034
- Utility knife
- Needlenose pliers

1 Using *two* people, lift the LC/MSD onto a stable bench or table.

Handholds are on the side and rear of the chassis. To avoid twisting while reaching, place the MSD on the bench facing backward, then turn it around.

W A R N I N G **Do *not* attempt to lift the LC/MSD (62 kg) without assistance.**

2 Unpack the mist filter, exhaust hose, and stainless steel pump oil drip pan from the shipping kit.

3 Remove the foreline pump from its shipping container:

— Cut the outer cardboard sleeve.
— Tilt the box on its side and slide the pump out of the box.
— Remove the plastic foam spacers.

4 Set the pump into the pump oil drip pan.

The purpose of the pan is to catch any small amounts of oil that may seep out of the pump. Additionally, the pan can contain all of the oil in the pump in case of a catastrophic seal failure.

5 Remove the plugged outlet connector and install the new KF-25 fitting that came with the pump.

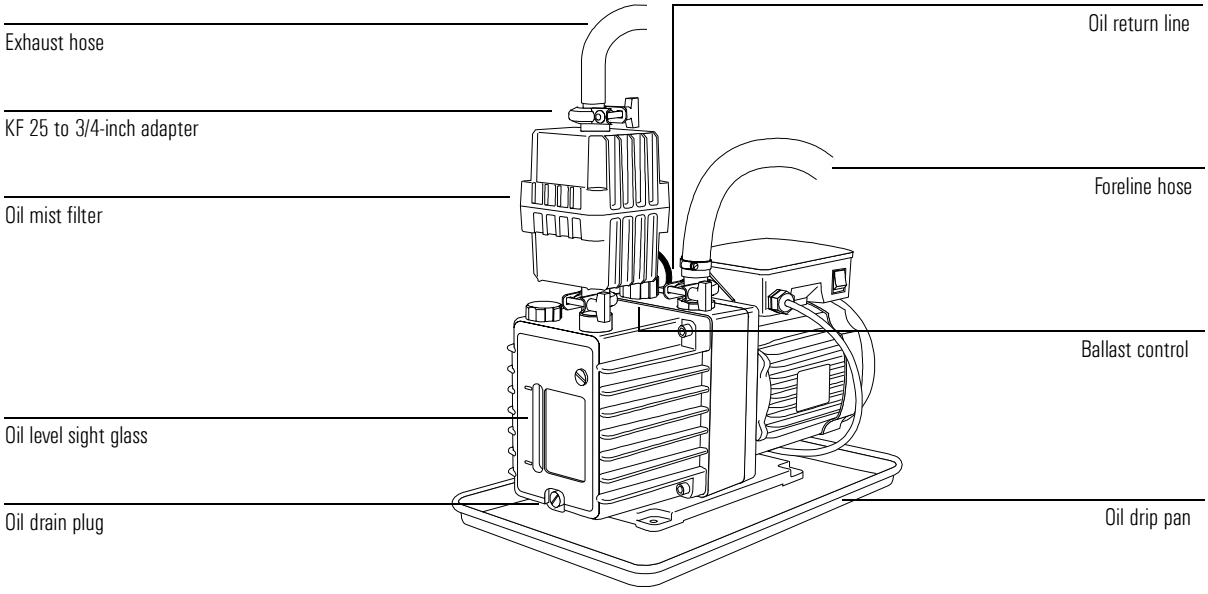
Do *not use* the outlet nozzle as described in the Edwards manual and on the warning tag.

6 Unpack the oil return kit from the pump box.

The felt plugs and screen are not needed.

7 Install the mist filter on the outlet port.

Be sure the small port on the side of the filter is on the side facing the ballast control and port (toward the motor end of the pump).



8 Install the oil return line:

— Install the restrictor into the black nitrile rubber tubing.
— Connect the tubing between the ballast port fitting and the oil mist filter. Use a pair of needlenose pliers to compress the clamps.

9 Set the ballast control to fully *open* (fully counterclockwise).

This allows oil trapped by the filter to return to the pump. If the Stage 1 pressure is greater than 2.5 Torr after pumpdown, turn the ballast control one or two turns clockwise to partially close the ballast.

10 Use the KF 25 to 1/2-inch hose fitting adapter to connect the 3/4-inch OD Tygon exhaust hose to the mist filter.

Pump oil (fluid)

The foreline pump comes filled with Inland 45 pump oil. You do ***not*** need to add additional oil at installation.

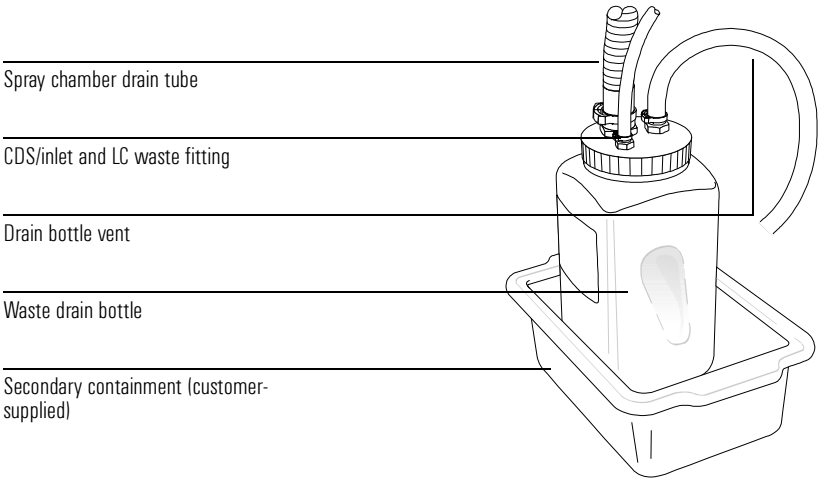
Connecting the LC/MSD

1 Connect the foreline hose to the foreline pump.

If the foreline pump is to be located to the front of the LC/MSD, then disconnect the foreline hose from the Stage 1 weldment on LC/MSD and route the foreline hose through the front hose exit port.

2 Using the supplied hook / loop fastener tape, secure the drain bottle into a secondary containment tub.

Check with the local fire department to determine whether secondary containment is necessary and what materials are acceptable for the container.



3 Connect the spray chamber drain tube to the 1-inch fitting on the drain bottle.

The drain tube can also be routed out the front of the LC/MSD if necessary.

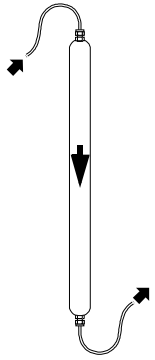
4 Attach the 1/4-inch calibrant delivery system (CDS) / inlet module waste tubing from the LC/MSD to the 1/4-inch fitting on the drain bottle.

5 Connect the drain bottle vent tubing to the 3/4-inch fitting on the drain bottle, then connect other end of the tubing to a vent connection that is *separate* from the vent used for the foreline pump.

C A U T I O N The drain bottle vent ***must*** be separate from the foreline pump vent to prevent the foreline pump exhaust from contaminating the the LC/MSD's spray chamber.

6 Connect the nitrogen gas conditioner between the nitrogen tank regulator or the nitrogen generator and the nitrogen gas fitting on the LC/MSD.

Use two lengths of 1/4-inch teflon supply tubing (0890-1793). Be sure to check the flow direction arrow on the nitrogen gas conditioner and connect the tubing accordingly. Secure the gas filter in a vertical position with tie wraps.



W A R N I N G **Nitrogen is the *only* acceptable drying and nebulizing gas. Air, oxygen, or other gases, when combined with solvents and high voltages in the spray chamber, could cause an explosion.**

7 Set the pressure on the nitrogen supply regulator to 80 to 100 psi.

Turn on the nitrogen gas for a few minutes to purge the tubing and gas conditioner before connecting the nitrogen gas supply to the LC/MSD. Regulator pressures above 100 psi cause nitrogen waste due to release from the bleed valve on the flow-control module.

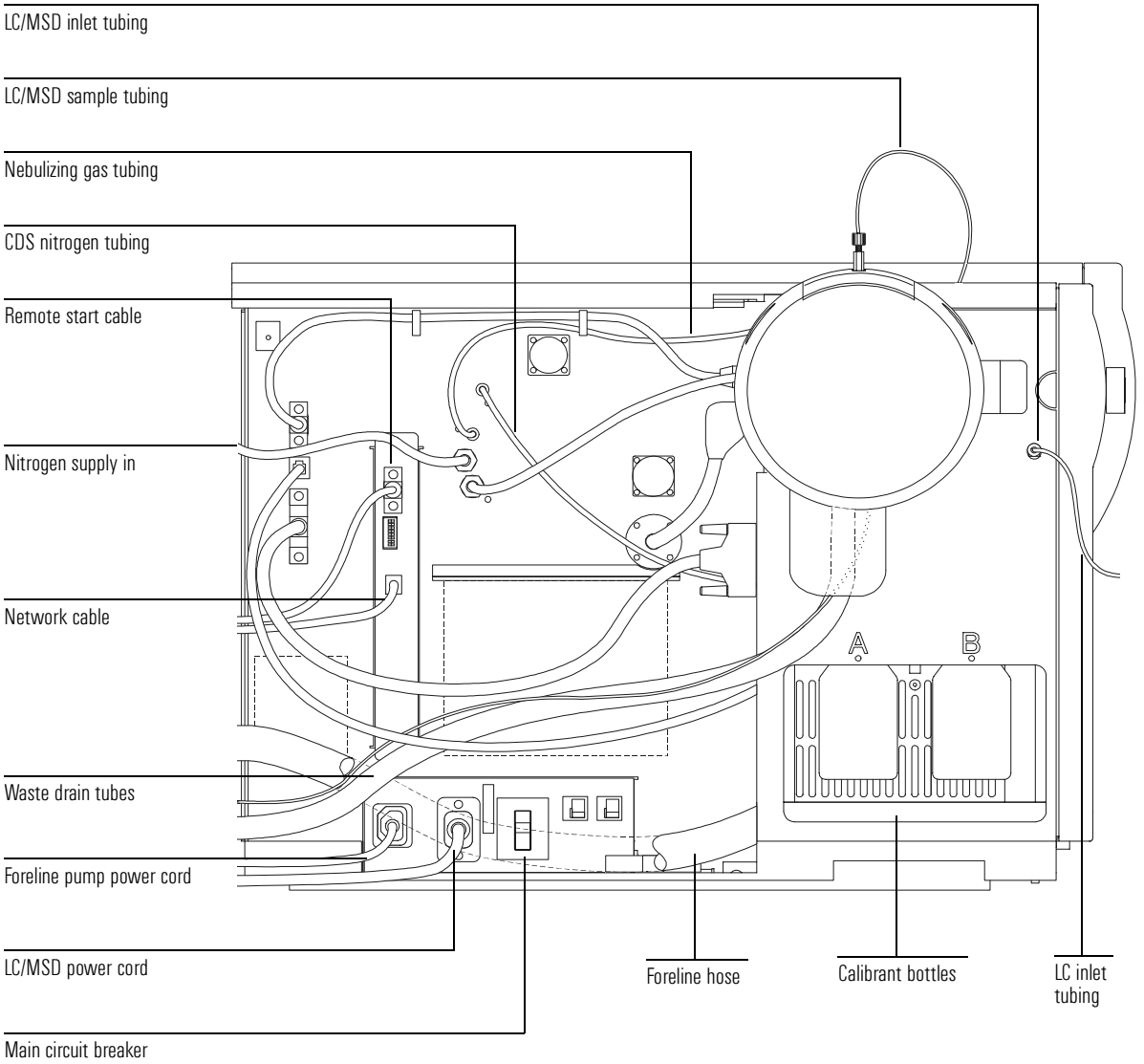
8 Connect the remote start cable to its connector on the LC/MSD.

You attach the other end of this cable to the LC later.

9 Verify that the main circuit breaker on the side panel and the front power switch are both in the Off position.

10 Plug the foreline pump power cord into the foreline pump power connector on the LC/MSD.

11 Plug the LC/MSD power cord into the LC/MSD power connector on the LC/MSD and the other end of the LC/MSD power cord into the wall outlet.



12 Turn on the main circuit breaker but leave the front power switch off.

Installing the Spray Chamber

Materials Needed

- HP G1947A APCI interface
- APCI calibrant, G2422A

  or

- HP G1948A Electrospray interface
- Electrospray calibrant, G2421A

1 Remove the foil covering the spray chamber mount, and remove the shipping cover from the spray chamber.

2 Install the appropriate spray chamber.

3 Connect the 1/8-inch nebulizing gas tubing from the LC/MSD mainframe to the nebulizer gas fitting.

4 Connect the LC/MSD sample tubing to the nebulizer zero dead volume fitting.

5 Rinse the calibrant bottles with acetonitrile.

6 Add the appropriate calibrant to the correct bottle of the calibrant delivery system (CDS).

- Electrospray calibrant (blue label) in bottle B

  or

- APCI calibrant (red label) in bottle A

If you only have one spray chamber, you can use the other calibrant bottle for a 90:10 acetonitrile / water flushing solution. Cover the label on the bottle with one indicating the actual contents. Be aware that the restriction in the CDS is designed for use with HP standard LC/MSD calibrants. Because of viscosity differences, flow rates of different solvents vary dramatically.

C A U T I O N

The O-ring seals in the CDS have ***poor*** compatibility with aliphatic, aromatic, and halogenated hydrocarbons. ***Never*** use these types of solvents in the CDS.

7 ***For APCI only*. Connect the APCI corona cable to the APCI HIGH VOLTAGE connector. Connect the vaporizer heater / cable to the APCI HEATER connector.**

8 **Turn on the LC/MSD power switch in front to initiate pumpdown of the LC/MSD.**

The foreline pump will become quieter within a few seconds.

Installing the LC

Materials Needed

- HPLC (or better) grade methanol *or* isopropanol *or* acetonitrile
- HPLC (or better) grade water

W A R N I N G

While it is *possible* to stack the HP 1100 Series LC modules on top of the LC/MSD without damaging the LC/MSD, this arrangement is potentially unstable and dangerous and is *not* recommended.

1 Install the HP 1100 LC system according to its installation documents.

Other LCs are supported for remote start only, with no ChemStation control.

2 Connect the remote start cable from the LC/MSD to a remote start connector on the LC.

3 Install a JetDirect card into the LC dectector module.

If thedectector module is not present, install the JetDirect card into the pump module.

4 Prepare LC solvents.

The organic solvent can be *methanol, isopropanol, or acetonitrile*. (See note below.)

- 50: 50 organic solvent / water for positive and negative ion verification
- 49.5: 49.5: 1 organic solvent / water / acetic acid for multiply-charged compound verification

N O T E

At least HPLC grade solvents should be used. Solvents that are acceptable for most LC applications may contain high levels of background that are detectable by the more sensitive LC/MSD. LC solvents used with the LC/MSD should be rated for both HPLC and pesticide, environmental, or GC/MS analyses. Use the highest purity solvents you can obtain. Acceptability of solvents must be *empirically* determined.

N O T E

Up to 1% acetic or formic acid can be added for positive ion verification. While this is usually not necessary, it may be beneficial to overcome ion suppression resulting from background contaminants in the mobile phase.

Installing the ChemStation

Installing the ChemStation consists of:

- Installing the Computer
- Installing the SICL Drivers and Configuring the LAN Client
- Installing the ChemStation Software
- Configuring the TCP/IP Network
- Installing and Configuring the CAG BootP Server
- Editing the HOSTS File
- Configuring the Instruments

Installing the Computer

1 **Verify that the line voltage is correct.**

2 **Unpack the PC, monitor, printer, and network hub.**

3 **Position the PC on the bench top.**

4 **Install the PC and monitor.**

See the installation documentation supplied with the PC.

5 **Verify that a network card is installed in the PC.**

6 **Install the network hub.**

Place it on the table next to the PC, plug the power supply into the hub, and connect the power supply to line power.

7 **Connect a Category 5, Shielded Twisted Pair (STP) cable from the 10BT LAN connection on the PC network card to any one of connectors 1-7 on the hub.**

Do not connect to port 8 on the hub.

NOTE If the Cascade port is to be used later to connect the hub to the site LAN, then port 8 must be left open.

8 **Connect a second Category 5 STP LAN cable from one of the open connectors 1-7 on the hub to the JetDirect card in one of the 1100 LC modules.**

Do not connect to port 8 on the hub.

9 **Connect a third Category 5 STP LAN cable from one of the open connectors 1-7 on the hub to the LAN connection on the LAN/MS control card in the LC/MSD.**

Do not connect to port 8 on the hub.

10 **At this point, do *not* connect the hub to the site LAN.**

Isolating the LC/MSD system from the site LAN enables the BootP server to recognize the address of the 1100 LC and the LC/MSD more easily.

11 Install the printer.

See the installation documentation supplied with the printer.

12 Turn on the printer, hub, monitor, and PC, in that order.

Installing the SICL Drivers and Configuring the LAN Client

The LC/MSD requires that the SICL drivers be installed and configured for LAN Client.

1 **Close any Windows applications that are running.**

2 **Insert the ChemStation CD-ROM into the drive.**

3 **In Windows NT Explorer, double-click the self-extracting installation program d:\hpib\wng0202(1).exe. Click Next or Back to navigate through the installation panels. The version of the driver you install must be G.02.02.01 or later.**

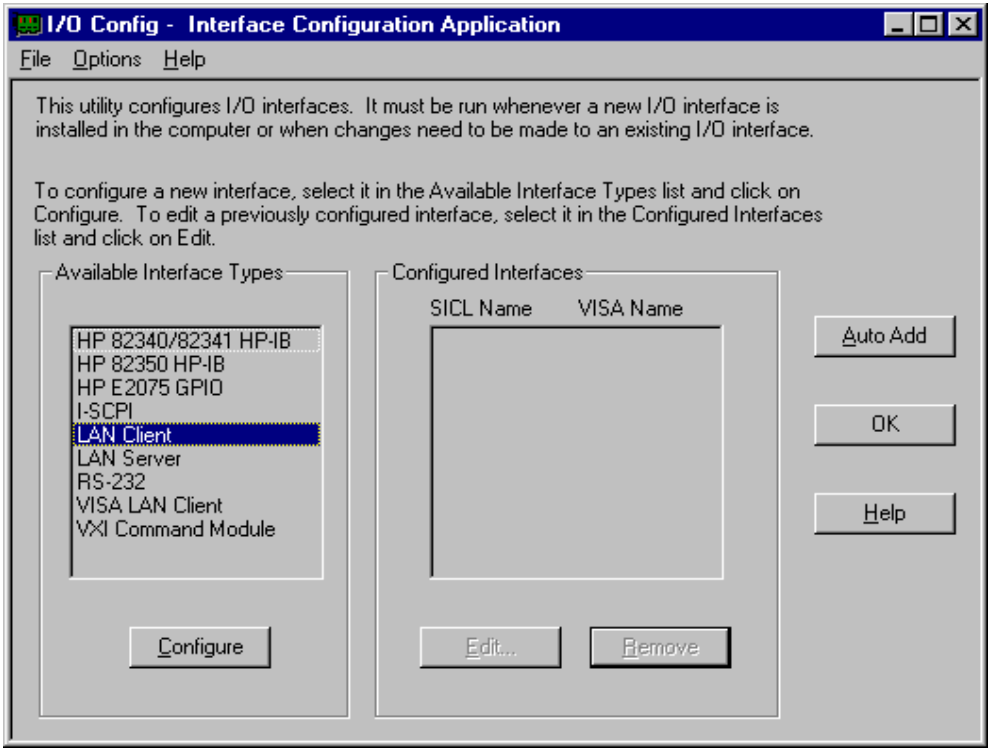
NOTE When the prompt "Install the HP E8491 VXI Components?" appears, leave the checkbox blank and click **Next**. *Do not install* the HP E8491 VXI Components.

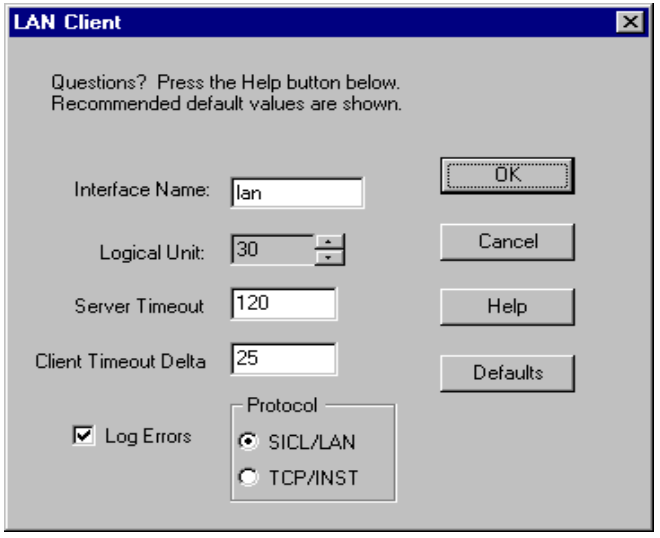
4 **Accept the default directories for both SICL and VISA software.**

5 **When the setup program is done copying files and creating program groups, select the Configure the Interfaces Manually option.**

6 **Select LAN Client in the configuration panel, then click Configure. The parameters shown on the next page can be used for configuring the LAN Client.**

7 **Click OK when you are asked to restart your system to activate the driver.**


I/O Config - Interface Configuration Application
File Options Help
This utility configures I/O interfaces. It must be run whenever a new I/O interface is installed in the computer or when changes need to be made to an existing I/O interface.
To configure a new interface, select it in the Available Interface Types list and click on Configure. To edit a previously configured interface, select it in the Configured Interfaces list and click on Edit.
Available Interface Types
HP 82340/82341 HP-IB
HP 82350 HP-IB
HP E2075 GPIO
I-SCPI
LAN Client
LAN Server
RS-232
VISA LAN Client
VXI Command Module
Configure
Configured Interfaces
SICL Name
VISA Name
Edit...
Remove
Auto Add
OK
Help


LAN Client
Questions? Press the Help button below.
Recommended default values are shown.
Interface Name:
lan
Logical Unit:
30
Server Timeout
120
Client Timeout Delta
25
Log Errors
Protocol
SICL/LAN
TCP/INST
OK
Cancel
Help
Defaults

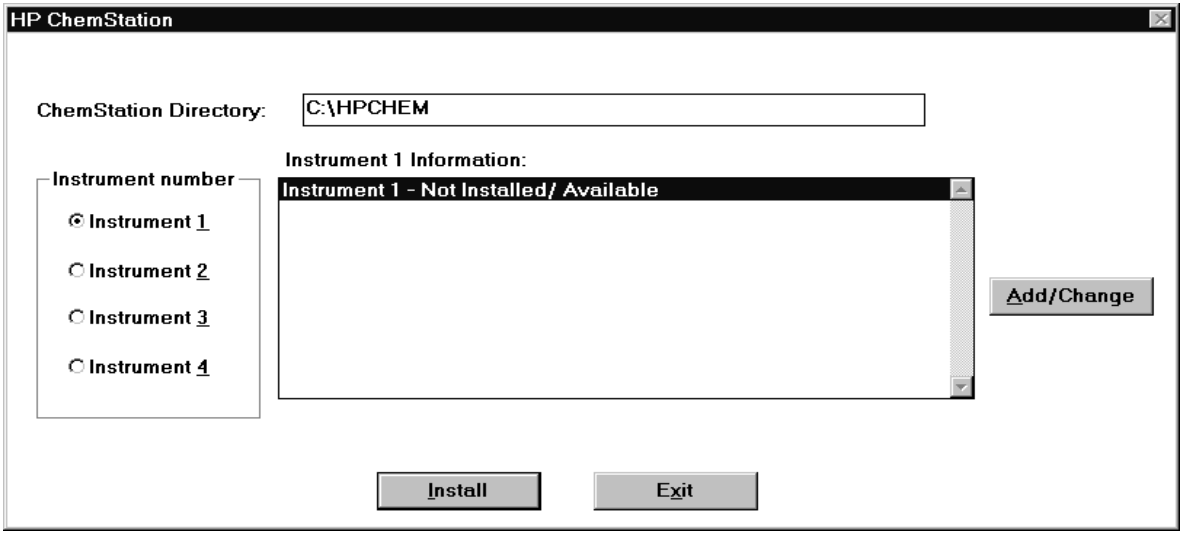
Installing the ChemStation Software

1 **Before installing the ChemStation software, make sure the PC has Windows NT 4.0 installed and configured as described on page 72.**

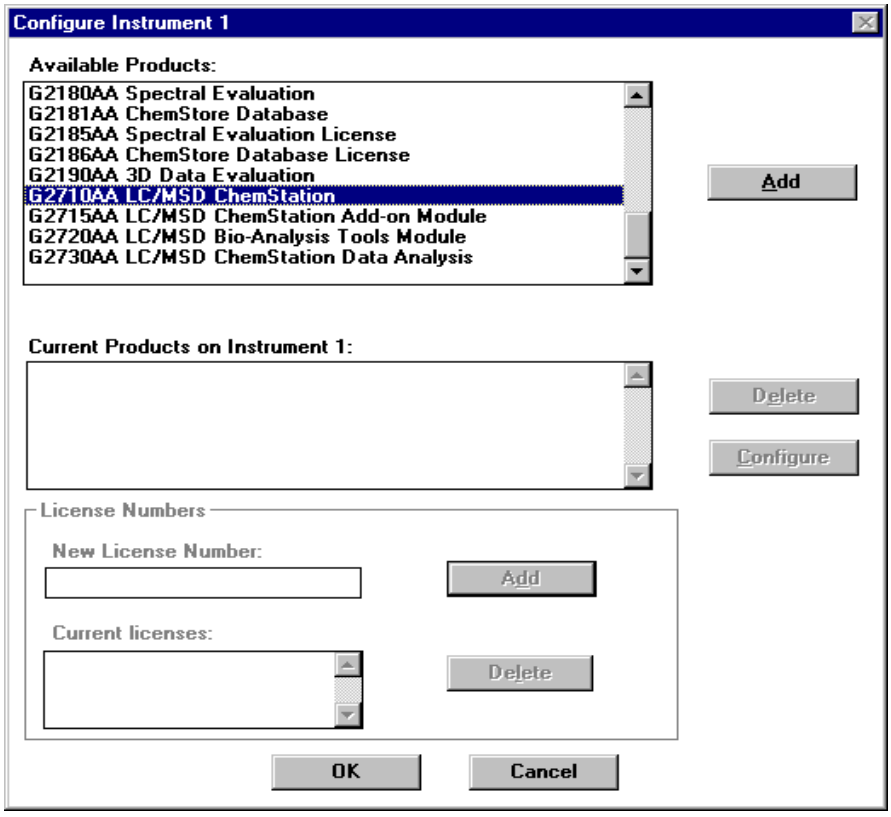
2 **Insert HP ChemStation CD-ROM into the CD-ROM drive.**

3 **In Windows NT Explorer, double-click on SETUP.EXE in the root directory on the CD-ROM.**

After a few seconds the Instrument Setup dialog box appears, as shown below:



4 **Select Instrument 1, and click Add/Change. The following dialog box appears:**



5 **Select G2710AA LC/MSD ChemStation from the list of available products in the Configure Instrument 1 dialog box, and click Add.**

6 **Enter the license number for the selected module in the New License Number field, and click Add.**

The license numbers are printed on the Software Certificate and Registration Packet.

7 **Repeat steps 5 and 6 for each module you want to install.**

8 **Click OK to return to the Instrument Setup dialog box.**

The selected modules with their license numbers are now displayed under the instrument number.

9 **Click Install to install the ChemStation software.**

10 When the installation is complete, the HP Configuration Editor window appears.

Exit this window; you will configure the instrument later.

11 Remove the ChemStation CD-ROM from the CD-ROM drive and store it in a safe place.

12 Reboot the PC.

13 Save the license numbers in a safe place.

These are required if you need to reinstall the software and for future upgrades.

14 Install the HP 1100 Series Maintenance and Repair CD-ROMs.

— Insert the HP1100 Series HPLC Maintenance CD-ROM in the CD-ROM drive.
— In Windows NT Explorer, double-click on **setup.exe.**
— Be sure to check the box to include the LC/MSD files.
— Follow the instructions on the screen.

15 Install the HP 1100 Series LC/MSD Reference Collection.

— Insert the first HP 1100 Series LC/MSD Reference Collection CD-ROM in the CD-ROM drive.
— In Windows NT Explorer, double-click on **setup.exe.**
— Follow the instructions on the screen.

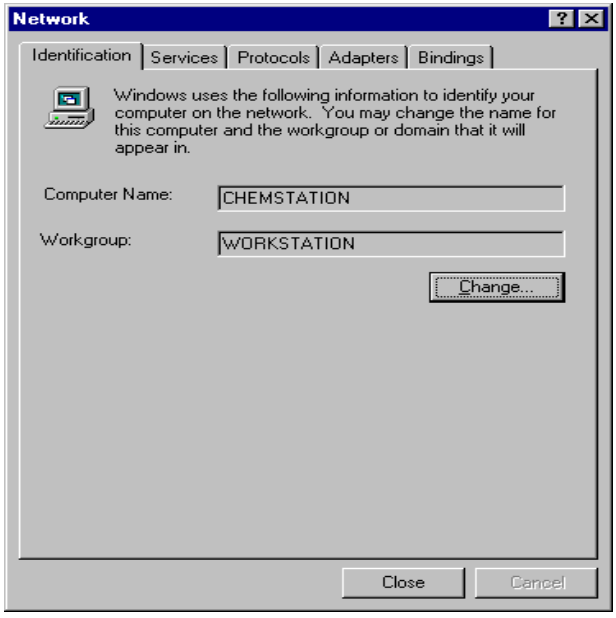
16 Find the Custom Instrument Files diskette that is supplied with the instrument binder.

Copy the **atunes.tun** and **atunem.tun** directories from the diskette to the **\hpchem\1\1946tune** directory on the PC.

Configuring the TCP/IP Network

1 Check to see if a network card is configured on your system.

From the Windows Control Panel, select **Network** to open the Network properties dialog box as shown in the following example.

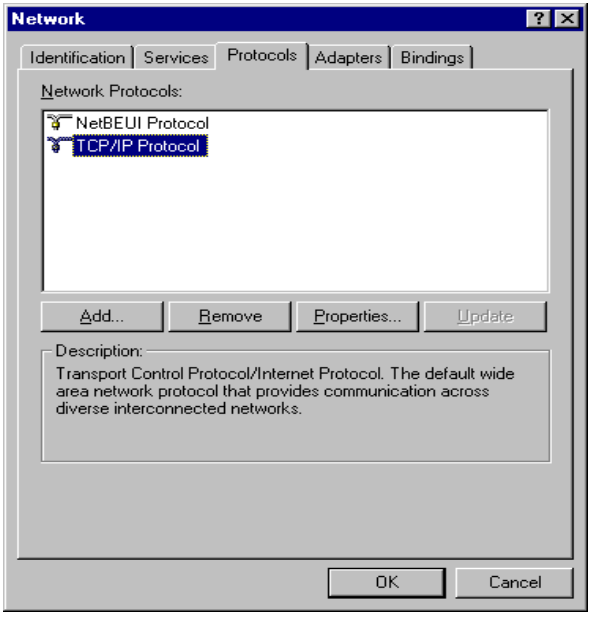


2 Check to see if a network card is already installed.

Select the **Adapters** tab on the Network properties dialog box. If no network card is configured, refer to the hardware manual of your network card and the PC for how to install and configure a network adapter card.

3 Check to see if a TCP/IP protocol is already installed.

Once the network adapter card is installed and configured, select the **Protocols** tab and check if a TCP/IP protocol is already installed (see example on following page).



4 Install TCP/IP protocol if required.

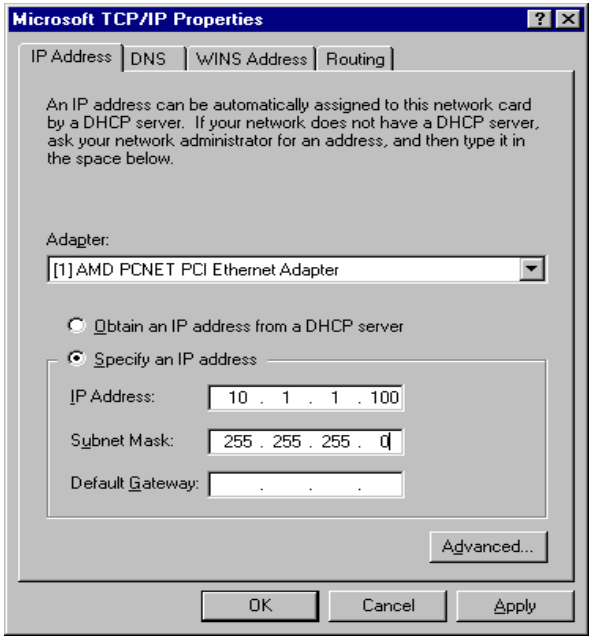
If no TCP/IP protocol is installed, select **Add** to add a network protocol stack, then select **TCP/IP protocol**. Select **No** to the usage of DHCP, and then specify the location of your Windows NT 4.0 CD-ROM or the Windows NT installation files on your hard disk. When the installation is done, select the **Bindings** tab to allow NT to associate the TCP/IP protocol with your installed network adapter.

N O T E

The analytical instruments are not supported on an network with a DHCP server. These servers also respond to BootP requests and do not set the buffer handling of the JetDirect card correctly. They may send a different IP address to the instrument each time it is started.

5 Set the IP Address and Subnet Mask.

After the TCP/IP Protocol has been added, highlight the **TCP/IP Protocol** in the Protocols tab, then click **Properties**. Enter the IP Address and Subnet Mask being used for the ChemStation Network (see example on the next page).



If the ChemStation is used only for local instrument control and will *not* be connected to the site LAN, then you can use the default computer name CHEMSTATION, the default IP address of 10.1.1.100, the default Subnet Mask of 255.255.255.0, and leave Default Gateway blank.

If the system *is* being setup on the site LAN, enter the IP Address, Subnet Mask, and Default Gateway provided by the system administrator. Add DNS and WINS addresses also if desired. DNS and WINS are not needed for ChemStation operation but are used to access the World Wide Web or browse a network that uses DHCP.

Installing and Configuring the CAG BootP Server

Use the following procedure to install and configure the BootP Server program, which allows you to configure instruments connected to the ChemStation via the network.

1 Install the BootP server from the ChemStation software CD.

Insert the ChemStation software CD into the CD-ROM drive. Exit out of the ChemStation software setup program if it starts up automatically. To install the BootP Server, double-click on the **setup.exe** file in the **\BootP** directory on the CD.

2 Start the CAG BootP server from the HP ChemStations program group or by re-booting the PC.

BootP runs automatically at Startup. Click once on BootP from the Taskbar to open the BootP Server window. The BootP server program should be left running (minimized is okay) at all times during instrument operation.

3 Discover the MAC address of the 1100 Jet Direct card and the LAN/MS Control card.

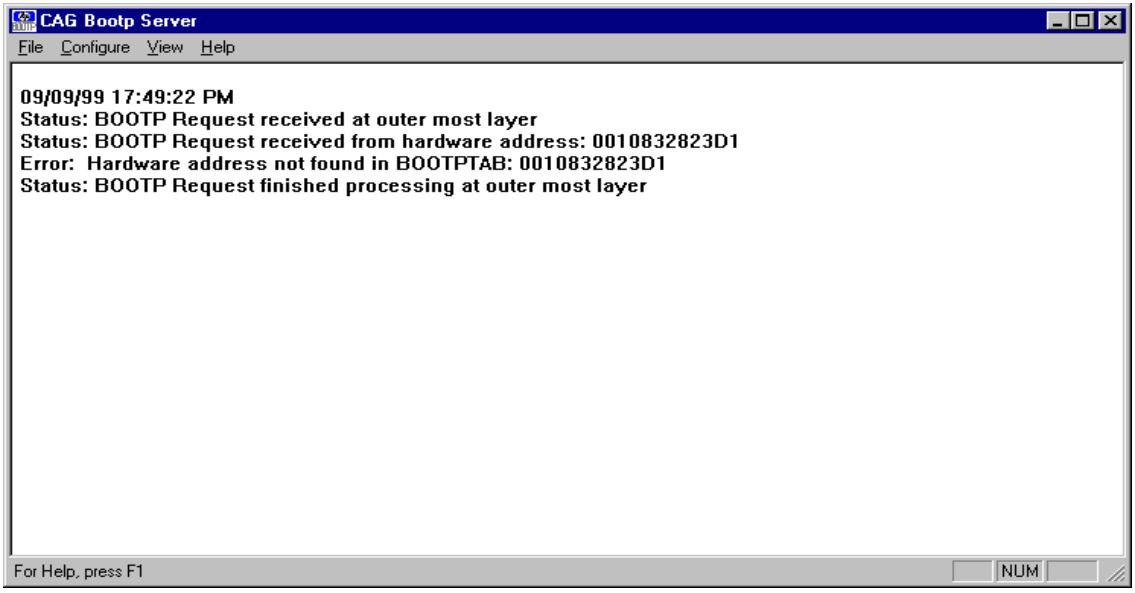
If the system is configured as a local ChemStation network, BootP can be used to discover the MAC address of the 1100 Jet Direct card and the LAN/MS Control card. To discover the MAC address of each card, open the BootP window, then power up each instrument individually while all other instruments on the network are powered off.

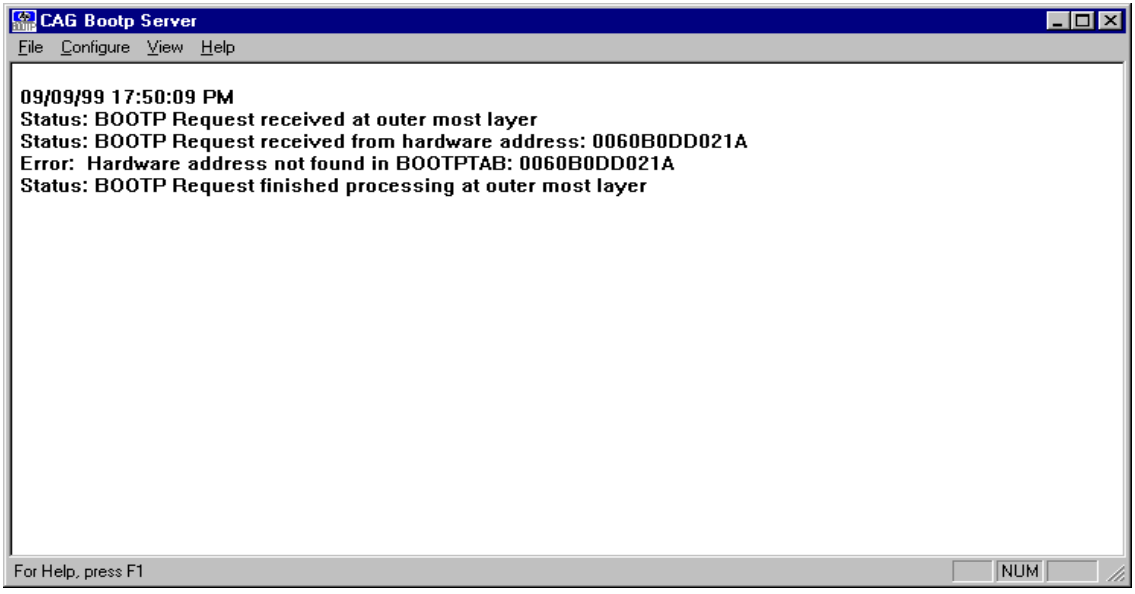
NOTE

When determining the MAC address for the Jet Direct card in the 1100 LC module, don't power off the LC/MSD--just disconnect the LAN cable from the LAN/MS Control card. Also, to power up the LC/MSD, just press the reset (RST) button on the LAN/MS Control card.

4 Make note of the MAC addresses of the JetDirect card and LAN/MS Control card.

Once the instrument has completed its self-test, the 1100 Jet Direct card or LAN/MS Control card will make a BootP request in the server window as shown on the following page.

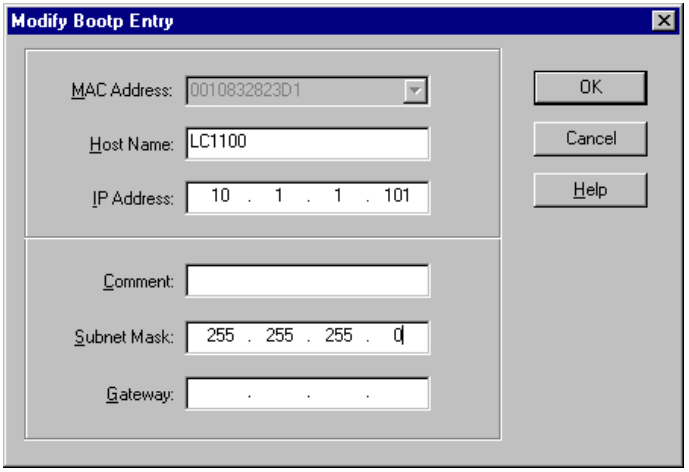

CAG Bootp Server
File Configure View Help
09/09/99 17:49:22 PM
Status: BOOTP Request received at outer most layer
Status: BOOTP Request received from hardware address: 0010832823D1
Error: Hardware address not found in BOOTPTAB: 0010832823D1
Status: BOOTP Request finished processing at outer most layer
For Help, press F1
NUM


CAG Bootp Server
File Configure View Help
09/09/99 17:50:09 PM
Status: BOOTP Request received at outer most layer
Status: BOOTP Request received from hardware address: 0060B0DD021A
Error: Hardware address not found in BOOTPTAB: 0060B0DD021A
Status: BOOTP Request finished processing at outer most layer
For Help, press F1
NUM

5 Configure the JetDirect card and the LAN/MS Control card as follows.

Select **Add Entry** from the **Configure** menu of the BootP Server window. If the MAC address was detected by powering on an instrument, the address will appear in the Add/Entry screen. If the address was not detected, then check the cabling and TCP/IP protocol settings, and try powering up the instruments again.

6 Select the MAC address for the JetDirect card in the 1100 LC module, and enter the Host Name and IP address for that instrument as shown below.



If the ChemStation is used only for local instrument control and will *not* be connected to the site LAN, then you can use the Host Name of LC1100 and IP address of 10.1.1.101.

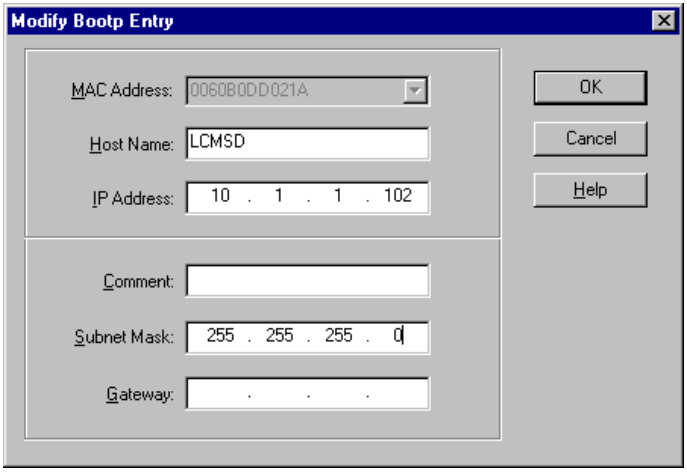
If the system *is* being setup on the site LAN, enter the Host Name and IP Address provided by the system administrator.

The comment field is optional. The Subnet Mask must match the TCP/IP configuration of the network card in the PC. The Gateway address is only required if the ChemStation is connected to the site LAN and should be supplied by the system administrator.

NOTE

If the default IP address is not used, make sure that the IP address supplied by the system administrator is unique. The first three fields of the IP address should be the same as the IP address specified for the PC.

7 Select the MAC address for the LAN/MS Control card in the LC/MSD, and enter the Host Name and IP address for that instrument as shown below.



If the ChemStation is used only for local instrument control and will *not* be connected to the site LAN, then you can use the Host Name of LCMSD and IP address of 10.1.1.102,

If the system *is* being setup on the site LAN, enter the Host Name and IP Address provided by the system administrator.

The comment field is optional. The Subnet Mask must match the TCP/IP configuration of the network card in the PC. The Gateway address is only required if the ChemStation is connected to the site LAN and should be supplied by the system administrator.

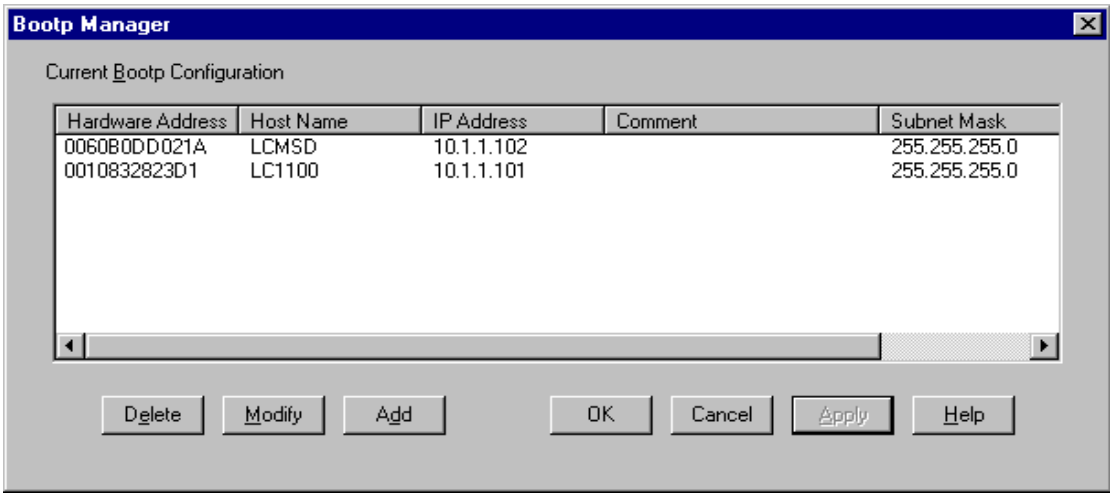
N O T E

If the default IP address is not used, make sure that the IP address supplied by the system administrator is unique. The first three fields of the IP address should be the same as the IP address specified for the PC and the 1100 LC.

8 Click OK when finished to close the Modify Bootp Entry dialog box.

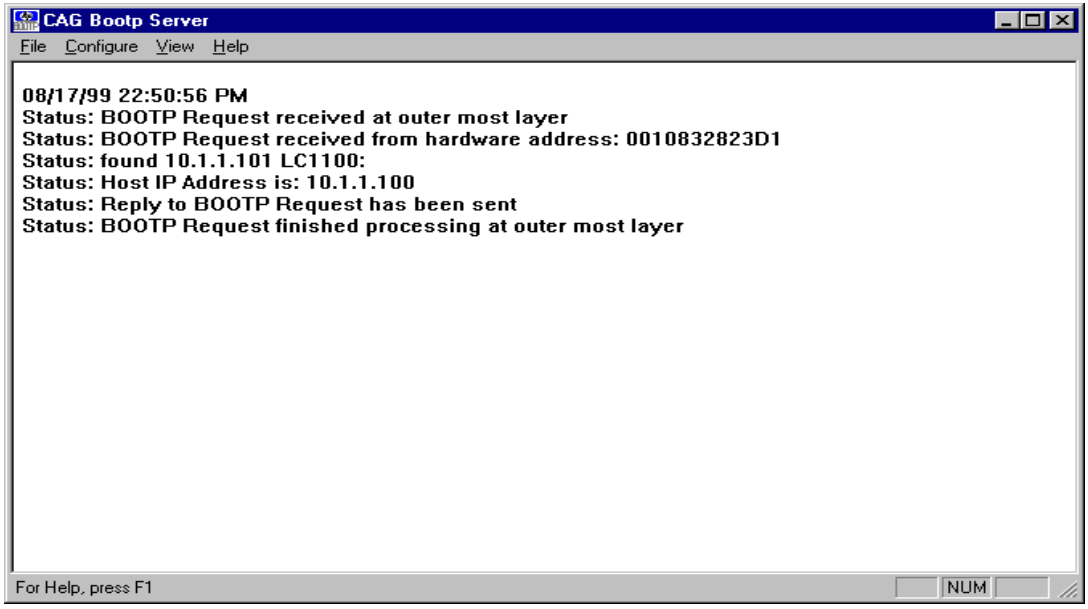
9 Confirm the BootP table entries you just made for the 1100 LC and the LC/MSD.

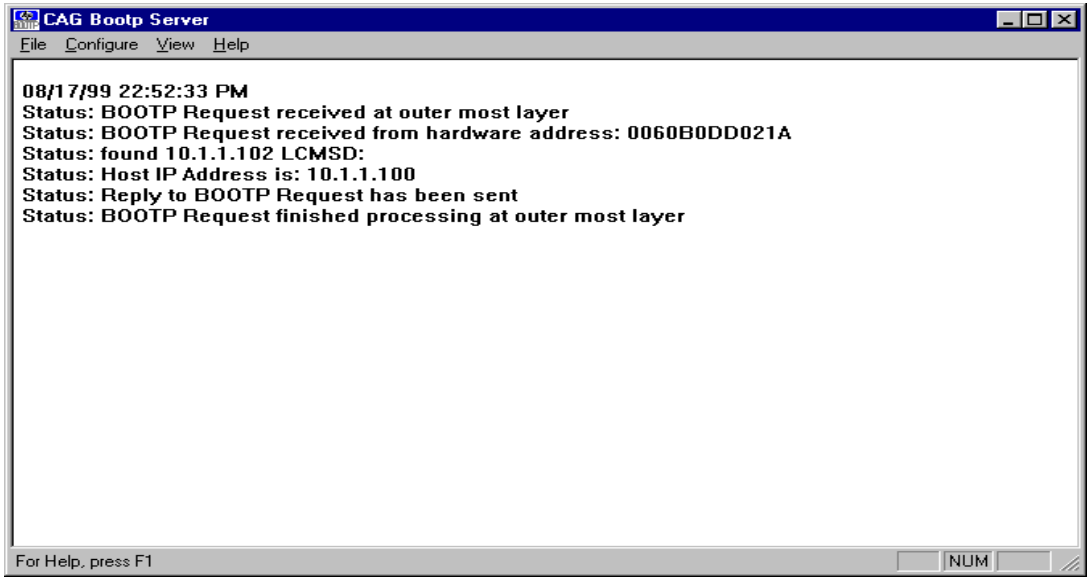
Select BootP manager from the Configure menu to view the current BootP configuration as shown in the following example.



10 Power cycle the instruments again to confirm that the instruments have been properly configured in the BootP Server.

Power cycle the instruments again by pressing the Reset button on the LC/MSD and the front power switch on the 1100 LC module where the JetDirect card is located (usually the UV detector). After the self-tests are complete, the BootP program assigns the correct IP addresses for the Host PC, the JetDirect card in the HP 1100, and the LAN/MS control card in the MSD. See the examples on the next page.


CAG Bootp Server
File Configure View Help
08/17/99 22:50:56 PM
Status: BOOTP Request received at outer most layer
Status: BOOTP Request received from hardware address: 0010832823D1
Status: found 10.1.1.101 LC1100:
Status: Host IP Address is: 10.1.1.100
Status: Reply to BOOTP Request has been sent
Status: BOOTP Request finished processing at outer most layer
For Help, press F1
NUM

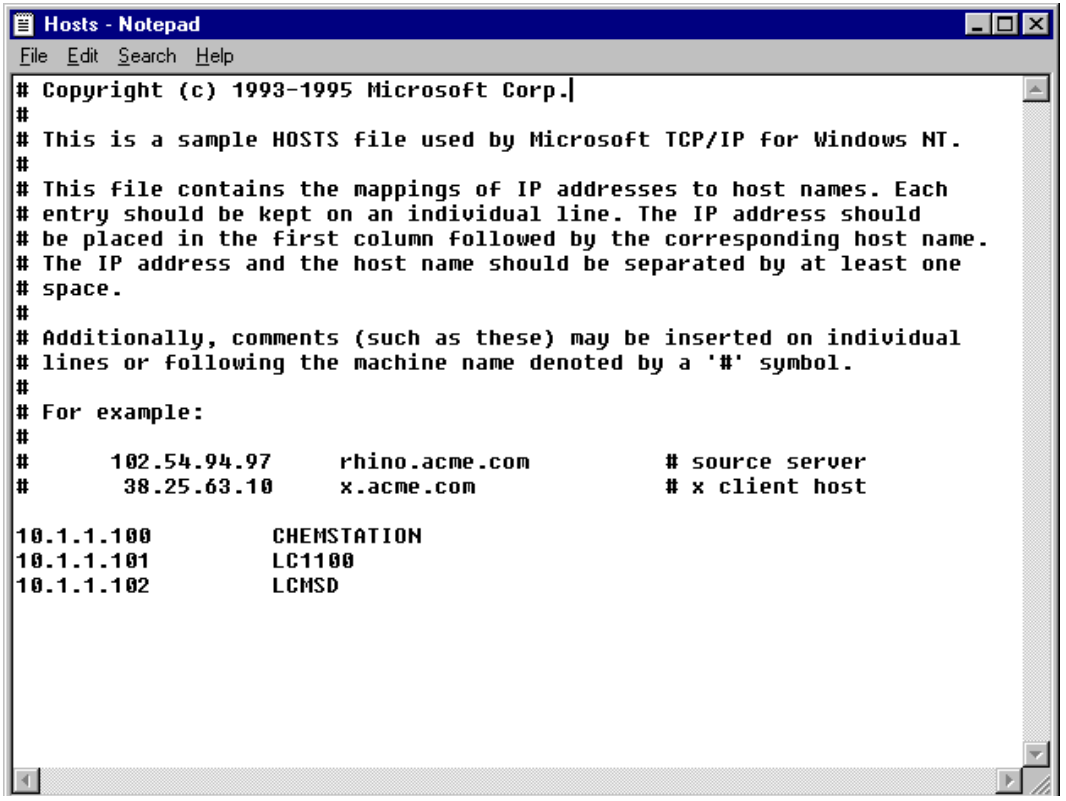

CAG Bootp Server
File Configure View Help
08/17/99 22:52:33 PM
Status: BOOTP Request received at outer most layer
Status: BOOTP Request received from hardware address: 0060B0DD021A
Status: found 10.1.1.102 LCMSD:
Status: Host IP Address is: 10.1.1.100
Status: Reply to BOOTP Request has been sent
Status: BOOTP Request finished processing at outer most layer
For Help, press F1
NUM

Editing the HOSTS File

In order for the PC to properly address the LC/MSD, you must also edit the HOSTS file as described below.

1 **Using Notepad, open the file HOSTS in the \winnt\system32\drivers\etc directory.**

2 **Type in the IP address and the Host Name for the PC, the 1100 LC, and the LC/MSD as shown in the example below.**



3 **Save the changes to the HOSTS file.**

Make sure to use the file name **HOSTS** (with *no* .txt extension).

4 **Reboot the PC.**

Configuring the Instruments

Use the following procedure to configure your LC/MSD instrument.

1 **Start the HP ChemStation Configuration Editor progam.**

2 **Select Instruments from the Configure menu. The Select Instrument dialog box appears.**

3 **For Instrument Type, select Modular LCMS System, then click OK.**

4 **Under Modules, select 1100 System Access (for the HP 1100 LC).**

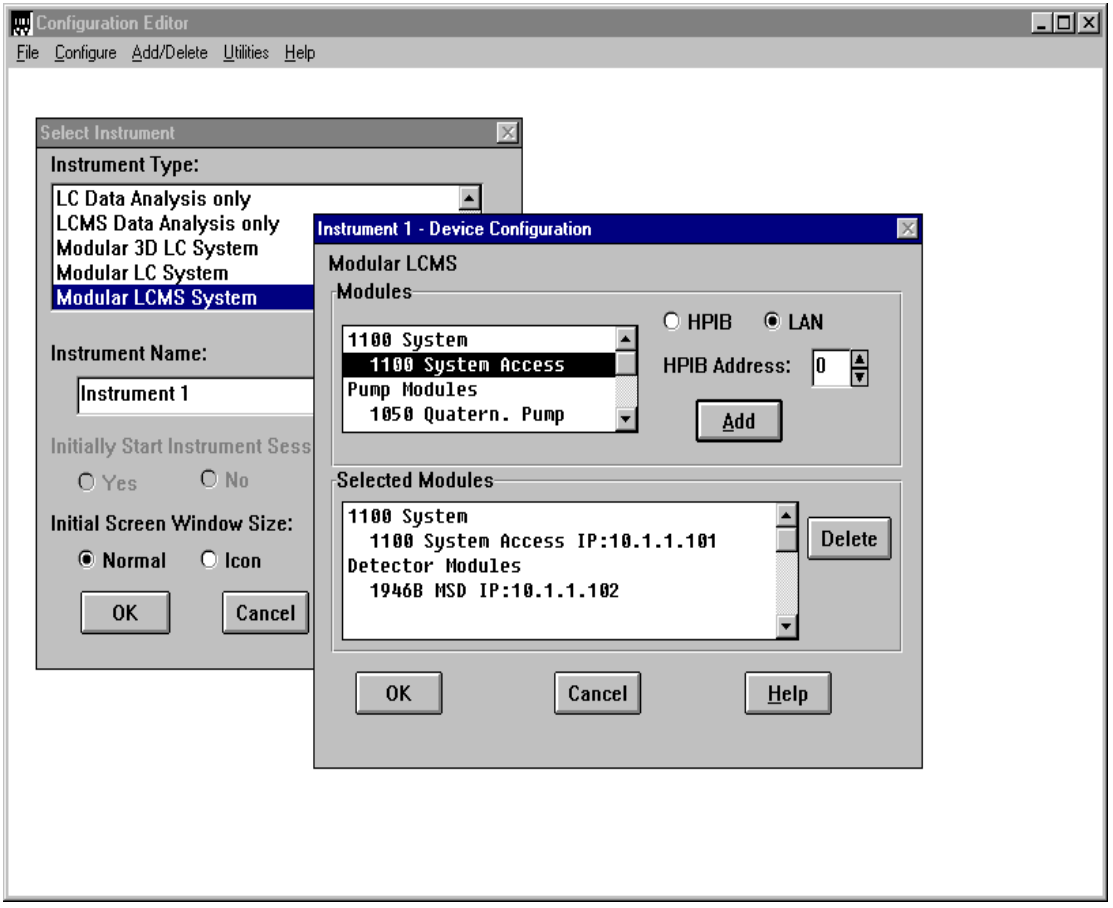
5 **Select the LAN option (*not* HPIB).**

6 **Click the Add button.**

7 **Select the Identify by IP address option, then enter the IP address for the JetDirect card in the 1100 LC Module as configured in the BootP server.**

8 **Repeat this configuration procedure for the G1946B Detector Module as shown on the following page.**

9 **Save the instrument configuration by selecting Save from the File menu, then close the Configuration Editor window.**


Configuration Editor
File Configure Add/Delete Utilities Help
Select Instrument
Instrument Type:
LC Data Analysis only
LCMS Data Analysis only
Modular 3D LC System
Modular LC System
Modular LCMS System
Instrument Name:
Instrument 1
Initially Start Instrument Sess
Yes No
Initial Screen Window Size:
Normal Icon
OK
Cancel
Instrument 1 - Device Configuration
Modular LCMS
Modules
1100 System
1100 System Access
Pump Modules
1050 Quatern. Pump
HPIB LAN
HPIB Address: 0
Add
Selected Modules
1100 System
1100 System Access IP:10.1.1.101
Detector Modules
1946B MSD IP:10.1.1.102
Delete
OK
Cancel
Help

Completing and Verifying Installation

Completing installation and verifying LC/MSD performance requires:

- Updating the LAN/MS Control Card Firmware (if required)
- Priming the LC Degasser and Verifying 1100 LC Firmware
- Baking Out the LC/MSD
- Verifying ChemStation Software Installation (optional)
- Preparing Performance Evaluation Samples
- Verifying LC/MSD Sensitivity
- Becoming Familiar with your LC/MSD System

Updating the LAN/MS Control Card Firmware (if required)

1 Start up the LC/MSD ChemStation online session and confirm that you can communicate with the 1100 LC and the LC/MSD.

If the message: "MS interface has an older firmware version x.xx.xx. Please update firmware to y.yy.yy or later." appears at the end of the ChemStation start-tup, proceed to step 2 to update the MS Interface firmware. Otherwise, no action is required.

2 Manually update the LAN/MS Control card firmware if required.

If you get the message shown above, manually update the LAN/MS Control card firmware as described below.

- Exit the ChemStation software.
- In Windows NT Explorer, double-click on **msupdate.exe** in the **\hpchem\ms\firmware** directory.
- When prompted, enter the IP address of the LC/MSD, then press Enter to proceed.
- You will be warned not disrupt power to the MSD during the update. Type **Y** to proceed. It may take several minutes to download the firmware.
- When prompted to power cycle the instrument, just depress the reset (RST) button located below the Serial A connection on the LAN/MS Control card in the LC/MSD.

When the firmware update is complete, the update window will automatically close.

Priming the LC Degasser and Verifying 1100 LC Firmware

1 **Start up the LC/MSD ChemStation.**

2 **Prime each channel of the 1100 LC vacuum degasser by pumping 5 ml/min of solvent for at least 10 minutes on each channel.**

3 **Verify that the firmware for each 1100 LC module is the latest available. Update the firmware as appropriate.**

4 **Continue with *Baking Out the LC/MSD* on the next page.**

Baking Out the LC/MSD

1 **Connect the LC/MSD inlet tubing (part number 0890-1915).**

2 **Set the drying gas flow to: 10 l/min for the Electrospray interface or 5 l/min for APCI interface.**

3 **Set the nebulizer pressure to 40 psi.**

4 **Set the drying gas temperature to 350° C.**

5 **Set the vaporizer temperature to 500° C (APCI interface only).**

6 **Set LC flow to 0.5 ml/min using the 50: 50 organic/water solvent.**
Organic solvent can be methanol, isopropanol, or acetonitrile.

7 **Allow the system to bake out at least 2 hours, preferably overnight.**

C A U T I O N If the system has been exposed to humid conditions during shipping or storage, a minimum of 4 hours bakeout is required to prevent arcing of the quadrupole.

8 **Begin software familiarization while the system is baking out.**

Verifying ChemStation Software Installation (optional)

After installing and configuring the HP ChemStation software, your internal validation procedure *may* require you to verify the correctness of the installation and to verify that the software is fully operational. This process is called Installation Qualification (IQ).

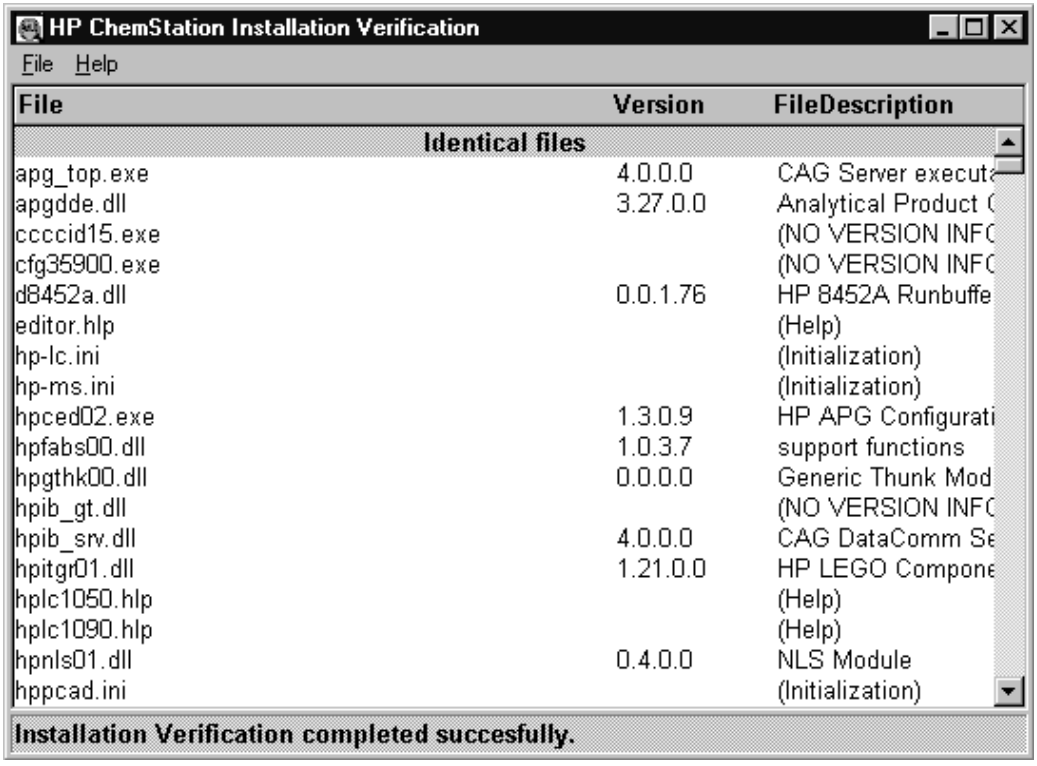
1 In the HP ChemStations program group, double-click on the Installation Qualification icon.

The following message box displays the name of each file as it is analyzed. This takes several minutes.

2 The IQ utility reports the following categories of files:

File Category	Explanation	Action Required
Identical files	Required files have passed the check.	None
Missing files	Necessary files are missing.	Reinstall the HP ChemStation software.
Modified files	Files have been modified or corrupted.	Reinstall unless you have customized the files.*
Invalid reference file	The original reference file is corrupt or has been modified since creation.	Reinstall the original reference file (requires reinstalling the HP ChemStation software).

* See the following page to learn how to create a reference file for a customized installation.



3 If you have customized or added any system files (*.dlc, *.dll, *.drv, *.enu, *.exe, *.hlp, *.ini, *.mac, or *.mcx), generate a customized reference file:

— Click the **Start** button and **Run** the HP IQ utility, typing the following:
C:\hpchem\sys\hpveri00.exe -f custom.ref

— Create an icon with the following command line in its properties:
hpveri00.exe -r custom.ref

For a complete description of the command line syntax of the IQ utility, click **Help** in the HP ChemStation Installation Verification window. You can also **Run** the help file, C:\HPCHEM\SYS\HPVERI.HLP.

Preparing Performance Evaluation Samples

Materials Needed:

- 1 ml graduated pipette, p/n 9301-1423
- 50 ml volumetric flask, p/n 9301-1424
- APCI negative-mode performance evaluation sample, HP G2425A
- ES negative-mode performance evaluation sample, HP G2424A
- Multiply-charged compound evaluation sample, HP G2426A
- Positive-mode performance evaluation sample, HP G2423A (for both interfaces)
- Plastic bottles for storing first dilution, p/n 9301-1433

  The supplied performance evaluation samples must be diluted to concentrations required for the LC/MSD system checkout. Use the solvent mixes you prepared for the LC installation (See *Installing the LC* on page 22.).

- 50:50 organic solvent / water is used for positive and negative ion verification.

NOTE Up to 1% acetic or formic acid can be added for positive ion verification. While this is usually not necessary, it may be beneficial to overcome ion suppression resulting from background contaminants in the mobile phase.

- 49.5:49.5:1 organic solvent / water / acetic acid is used for multiply-charged compound verification.

NOTE At least HPLC grade solvents should be used. Solvents that are acceptable for most LC applications may contain unacceptably high levels of background contaminants detectable by the more sensitive LC/MSD. LC solvents used with the LC/MSD should be rated for both HPLC and pesticide, environmental, or GC/MS analyses. Use the highest purity solvents you can obtain.

Acceptability of individual lots of solvents must be empirically determined. Methanol, isopropanol, and acetonitrile are all acceptable organic solvents for the performance evaluation samples; if one solvent shows too much background, another may be substituted.

NOTE Use the diluted samples within a day of dilution. Refrigerate the intermediate (first) dilution in the supplied bottles.

Tips:

- Always rinse the graduated pipettes and volumetric flasks *thoroughly* with deionized water before, in between, and after use.
- Use polypropylene labware for preparing performance evaluation samples, since glass vessels introduce unacceptable levels of sodium.
- Always rinse the autosampler vials and caps with the solvent mix used for sample dilution prior to filling them with the performance verification samples. This minimizes any background contributed by the vials and caps. The vials may be run uncapped if the septa are found to be a source of background contamination.

Performance Verification Summary by Technique

	ES Positive Mode	**ES Negative Mode**	**ES Multiply-Charged Mode**	**APCI Positive Mode**	**APCI Negative Mode**
Sample	Reserpine, 5 ng/µl	Acid Red 4, 10 ng/µl	Myoglobin	Reserpine, 5 ng/µl	Nitrophenol, 10 ng/µl
Concentration after dilution	2 pg/µl	20 pg/µl	3.33 pmoles/µl	2 pg/µl	20 pg/µl
Total sample amount injected	10 pg	100 pg	50 pmole	10 pg	100 pg
Sample order number	HP G2423A	HP G2424A	HP G2326A	HP G2423A	HP G2425A
Solvent	50:50 organic / water	50:50 organic / water	49.5:49.5:1 organic / water / acetic acid	50:50 organic / water	50:50 organic / water
Method name	MSSUPRES.M	MSSUPAR4.M	MSSUPMYO.M	MSSUPCI.M	MSSUP4NP.M
Performance Specification	10: 1 pk-pk 50: 1 rms	None	None	10: 1 pk-pk 50: 1 rms	None

Electrospray and APCI, Positive Mode

1 **Transfer 1 ml of 5 ng/µl reserpine (HP G2423A) to a 50 ml volumetric flask.**
Use a clean graduated pipette.

2 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

3 **Transfer 1 ml of the of the first dilution to a second 50 ml volumetric flask.**
Use a clean graduated pipette.

4 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**
This provides the final 2 pg/µl reserpine concentration required for performance verification.

5 **Transfer approximately 1 ml of the second dilution to a vial for use in the LC autosampler.**

Electrospray, Negative Mode

1 **Transfer 1 ml of 10 ng/µl acid red 4 (HP G2424A) to a 50 ml volumetric flask.**
Use a clean graduated pipette.

2 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

3 **Transfer 5 ml of the first dilution to a second 50 ml volumetric flask.**
Use a clean graduated pipette.

4 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**
This provides the final 20 pg/µl acid red 4 concentration required for performance verification.

5 **Transfer approximately 1 ml of the second dilution to a vial for use in the LC autosampler.**

APCI, Negative Mode

1 **Transfer 1 ml of 10 ng/µl 4-nitrophenol (HP G2425A) to a 50 ml volumetric flask.**

Use a clean graduated pipette.

2 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

3 **Transfer 5 ml of the of the first dilution to a second 50 ml volumetric flask.**

Use a clean graduated pipette.

4 **Dilute to the 50 ml mark with 50:50 organic solvent / water.**

This provides the final 20 pg/µl 4-nitrophenol concentration required for performance verification.

5 **Transfer approximately 1 ml of the second dilution to a vial for use in the LC autosampler.**

Electrospray, Multiply-Charged Compound Test

Prepare this sample *only if* the optional HP G2720AA deconvolution software was purchased with the LC/MSD system.

1 **Find the sample and solvent for the multiply-charged compound test in the electrospray test sample kit (HP G2326A).**

2 **Transfer 3.0 ml of the electrospray test solvent (49.5:49.5:1 methanol / water / acetic acid) to a bottle containing the electrospray test sample (lyophilized horse skeletal muscle myoglobin).**

Use a clean graduated pipette to transfer the test solvent. Swirl the bottle to dissolve and mix the sample. This provides a final 3.33 pmole/µl myoglobin sample concentration.

Verifying LC/MSD Sensitivity

Use the methods specified below to verify the performance of the LC/MSD system for the interface types that were purchased with the system.

The performance verification requires that the LC column be removed from the LC flow path. Disconnect the LC column and install a short piece of 0.005-inch bypass tubing in place of the column, between the column heat exchanger outlet and the detector inlet. You can also connect the injector output directly to the inlet of the LC/MSD.

The performance verification methods require an HP 1100 LC with an autosampler.

CAUTION Be sure that you have entered the custom parameters. Otherwise it may not be possible to tune the LC/MSD.

Electrospray Interface, Positive Mode

1 Start up the LC/MSD ChemStation software and load the method MSSUPRES.M.

2 Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.

All other LC and MS parameters should correspond to the parameters given in *LC and MSD Parameters for Installation Verification*, 75.

3 Perform an autotune.

After the autotune has completed, you may need to wait up to 30 minutes before continuing to allow for the calibrant solution to be pumped out of the MSD. This minimizes any background signal resulting from the calibrant.

NOTE

You may need to further optimize the nebulizer pressure by running FIA experiments to achieve maximum instrument sensitivity.

4 Place the vials into the LC autosampler.

— Position #1: empty, uncapped vial
— Position #2: vial of the solvent used for dilution (solvent blank)
— Position #3: vial with the electrospray reserpine sample (2 pg/µl)

5 Run the method.

The method performs an FIA run with one injection of the empty vial, five injections of the solvent blank, and five injections of the reserpine sample.

6 Review the results.

When the method is finished, a report prints showing the signal-to-noise ratio for the five blank and five sample peaks, and a blank-subtracted average of the sample peaks. The blank-subtracted average signal-to-noise value must be greater than or equal to 10:1 peak-to-peak (50:1 RMS).

Electrospray Interface, Negative Mode

1 Load the method MSSUPAR4.M.

2 Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.

All other LC and MS parameters should correspond to the parameters given in *LC and MSD Parameters for Installation Verification*, 75.

3 Perform an autotune.

You do not need to perform a second autotune if a positive and negative ion autotune was performed prior to the positive mode verification.

If you *do* perform an autotune, you may need to wait up to 30 minutes before continuing to allow for the calibrant solution to be pumped out of the MSD. This minimizes any background signal from the calibrant.

NOTE You may need to further optimize the nebulizer pressure to achieve maximum instrument sensitivity.

4 Place the vials into the LC autosampler.

— Position #1: empty, uncapped vial
— Position #2: vial of the solvent used for dilution (solvent blank)
— Position #3: vial with the acid red 4 sample (20 pg/µl)

5 Run the method.

The method performs an FIA run with one injection of the empty vial, five injections of the solvent blank, and five injections of the acid red 4 sample.

6 Review the results.

When the method is finished, a report prints showing the signal-to-noise ratio for all peaks integrated in the chromatogram. There is no sensitivity specification for this sample.

Electrospray Interface, Multiply-Charged Compound Test

Perform this test *only if* the optional HP G2720AA Deconvolution software was purchased with the LC/MSD system.

1 Load the method MSSUPMYO.M.

2 Edit the method.

Ensure that 49.5:49.5:1 organic solvent / water / acetic acid is selected as the LC solvent. All other LC and MS parameters should correspond to the parameters given in *LC and MSD Parameters for Installation Verification*, 75.

3 Perform an autotune.

You do not need to perform another autotune if you have recently performed one as part of the positive mode or negative mode electrospray verification. If you *do* perform an autotune, you may need to wait up to 30 minutes before continu to allow for the calibrant solution to be pumped out of the MSD. This minimizes any background signal from the calibrant.

4 Place the vials into the LC autosampler.

— Position #1: empty, uncapped vial
— Position #2: vial with the myoglobin sample

5 Run the method.

The method does an FIA run with one injection of the empty vial and five injections of the myoglobin sample.

6 Review the results.

When the method is finished, a report prints showing the extracted ion chromatograms of the masses 893.90, 1131.10, and 1413.10 and the signal-to-noise ratios for all peaks integrated in the extracted ion chromatograms. The report also lists the calculated, deconvoluted molecular weight of the myoglobin peaks and gives "% error" of the calculated molecular weight compared to the theoretical myoglobin molecular weight.

There is no sensitivity specification for this sample.

APCI Interface, Positive Mode

1 Load the method MSSUPCI.M.

2 Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.

All other LC and MS parameters should correspond to the parameters given in *LC and MSD Parameters for Installation Verification*, 75.

3 Perform an autotune.

After the autotune has completed, you may need to wait up to 30 minutes before continuing to allow for the calibrant solution to be pumped out of the MSD. This minimizes any background signal from the calibrant.

NOTE You may need to further optimize the nebulizer pressure to achieve maximum instrument sensitivity.

4 Place the vials into the LC autosampler.

— Position #1: empty, uncapped vial
— Position #2: vial of the solvent used for dilution (solvent blank)
— Position #3: vial with the reserpine sample (2 pg/µl)

5 Run the method.

The method performs an FIA run with one injection of the empty vial, five injections of the solvent blank, and five injections of the reserpine sample.

6 Review the results.

When the method is finished, a report prints showing the signal-to-noise ratio for the five blank and five sample peaks, and a blank-subtracted average of the sample peaks. The blank-subtracted average signal-to-noise value must be greater than or equal to 10:1 peak-to-peak (50:1 RMS).

APCI Interface, Negative Mode

1 Load the method MSSUP4NP.M.

2 Edit the method to ensure that 50:50 organic solvent / water is selected as the LC solvent.

All other LC and MS parameters should correspond to the parameters given in *LC and MSD Parameters for Installation Verification*, 75.

3 Perform an autotune.

You do not need to perform a second autotune if a positive and negative autotune was run prior to the positive mode verification.

If you *do* perform an autotune, you may need to wait up to 30 minutes before continuing to allow for the calibrant solution to be pumped out of the MSD. This minimizes any background signal due to the calibrant.

NOTE You may need to further optimize the nebulizer pressure to achieve maximum instrument sensitivity.

4 Place the vials into the LC autosampler:

— Position #1: empty, uncapped vial
— Position #2: vial of the solvent used for dilution (solvent blank)
— Position #3: vial with 4-nitrophenol sample (20 pg/µL)

5 Run the method.

The method peforms an FIA run with one injection of the empty vial, five injections of the solvent blank, and five injections of the 4-nitrophenol sample.

6 Review the results.

When the method is finished, a report prints showing the signal-to-noise ratio for all peaks integrated in the chromatogram. There is no sensitivity specification for this sample.

Becoming Familiar with your LC/MSD System

Follow the topics given in the familiarization checklist in chapter 3 to familiarize yourself with the LC/MSD system.

Topics of ***special*** importance:

- Small drips of oil from the foreline pump are *not* unusual.
- For cleaning the capillary, pre-wet the inside of the capillary with isopropanol before inserting the cleaning wire. The alcohol acts as a lubricant, making it easier to insert the wire.

Special Spray Chamber Maintenance

- Be sure to clean the spray chamber ***every day***, as shown in the HP 1100 Series LC/MSD Maintenance and Repair CD-ROM.
- The ***electrospray*** spray chamber needs ***extra cleaning at least weekly***:
  - —Remove the spray chamber and place it cover-side down.
  - —Fill the spray chamber with 50:50 organic: water solution to cover the standoffs for the mesh electrode.
  - —Gently scrub the insulators with a cotton swab (part number 8520-0023).

3

Checklists

Installation Checklist

☐ Inspecting Shipped Material

- ☐ Open shipping containers only with a Hewlett-Packard representative present to verify the contents of each container.
- ☐ Unpack containers.
- ☐ Check off each item on the packing list.
- ☐ Record the serial numbers in the installation documentation.
- ☐ Retain shipping containers and material until contents are checked for completeness and instrument performance is verified.
- ☐ Notify supplying division of any missing or damaged items.
- ☐ Shipment damaged or incomplete:

  Product Support or Order Processing notified:

  Date _____

  Person contacted _____

  DM notified (date) _____

  Carrier notified (date) _____

  Damaged/missing material:

  _____

  _____

  _____

  _____

☐ LC/MSD Installation

- ☐ LC/MSD placed on bench (two-person lift)
- ☐ Foreline pump unpacked and placed on the oil drip pan
- ☐ Mist filter installed
- ☐ Oil return line installed
- ☐ Ballast control set to fully *open* (counterclockwise)
- ☐ Exhaust hose installed and connected to vent
- ☐ Foreline hose connected
- ☐ Drain bottle secured and all four lines connected
- ☐ Nitrogen supply tubing and gas conditioner installed
- ☐ Nitrogen regulator set to 80-100 psi
- ☐ Gas conditioner purged before connecting to LC/MSD
- ☐ Remote start cable from the LC to the LC/MSD connected
- ☐ Foreline pump and ac supply power cords connected to the LC/MSD
- ☐ Line voltage verified
- ☐ LC/MSD power cord connected to an appropriate AC outlet
- ☐ Main circuit breaker turned **on** (front power switch is still **off**)
- ☐ Spray chamber installed
- ☐ LC/MSD front power switch **on to initiate pumpdown**
- ☐ Foreline pump operation verified

☐ HP 1100 LC Installation

- ☐ HP 1100 LC installed per LC documentation
- ☐ Remote start cable connected between the LC/MSD and the LC
- ☐ JetDirect card installed in the LC dectector module
- ☐ LC solvents prepared

☐ LC/MSD ChemStation Computer Installation

- ☐ Line voltage verified
- ☐ PC, monitor, printer, and network hub unpacked
- ☐ PC positioned on the bench
- ☐ PC and monitor installed

- ☐ Verify network interface card installed in the PC
- ☐ Network hub installed
- ☐ Category 5, Shielded Twisted Pair (STP) cable connected from the 10BT LAN connection on the PC network card to any one of connectors 1-7 on the hub
- ☐ A second Category 5 STP LAN cable connected from one of the open connectors 1-7 on the hub to the JetDirect card in one of the 1100 LC modules
- ☐ A third Category 5 STP LAN cable connected from one of the open connectors 1-7 on the hub to the LAN connection on the LAN/MS Control card
- ☐ Hub *not* connected to the site LAN at this time
- ☐ Printer installed
- ☐ Printer, hub, monitor, and PC turned on (in that order)

☐ Installing the SICL Drivers and Configuring the LAN Client

- ☐ All Windows applications (programs) closed
- ☐ Run **d:\hpib\wng0202(1).exe** on the ChemStation CD-ROM
- ☐ Selected SICL driver version HP G.02.02.01 or later and installed into default directories for both SICL and VISA software
- ☐ Configured the LAN Client
- ☐ Restarted the system to activate the SICL driver

☐ LC/MSD ChemStation Software Installation

- ☐ Windows NT 4.0 and Service Pack 4 installation and configuration verified
- ☐ Run **Setup.exe** on ChemStation CD-ROM
- ☐ **Instrument 1** selected, **Add/Change** clicked
- ☐ G2710AA LC/MSD ChemStation selected
- ☐ License number entered
- ☐ Other modules selected and registered
- ☐ ChemStation software installed
- ☐ MS Configuration window closed (will configure later)
- ☐ Software CD and license numbers safely stored
- ☐ Maintenance CD-ROMs installed (LC *and* LC/MSD)
- ☐ *LC/MSD Reference Collection* CD-ROM set installed
- ☐ **atunes.tun** and **atunem.tun** directories copied from the Custom Instrument Files diskette to the **\hpchem\1\1946tune** directory on the PC

☐ Network Configuration

- ☐ TCP/IP Network configured
- ☐ CAG BootP Server installed and configured
- ☐ HOSTS file edited

☐ Instrument Configuration

- ☐ HP Configuration Editor progam started
- ☐ **Instruments** selected from the **Configure** menu
- ☐ **Modular LCMS System** selected as Instrument Type
- ☐ **1100 System Access** Module selected (for the HP 1100 LC)
- ☐ **LAN** option selected (*not* HPIB)
- ☐ **Add** button clicked
- ☐ **Identify by IP address** option selected; entered IP address for the JetDirect card in the 1100 LC Module
- ☐ Configured the G1946B Detector Module using the above steps
- ☐ Instrument configuration saved

☐ Completing and Verifying Installation

- ☐ LAN/MS Control card firmware version checked and updated if required
- ☐ LC/MSD ChemStation started up
- ☐ Each channel of the 1100 LC vacuum degasser primed
- ☐ 1100 LC module firmware version checked and updated if required
- ☐ LC/MSD baked out at least 2 hours
- ☐ Performance evaluation samples prepared
- ☐ Tune performance verified
- ☐ Sensitivity performance verified

Familiarization Checklist

Purpose of Familiarization

Familiarization is intended to give operators a basic overview of the operation and maintenance of new instruments, systems, and application software and is *not* designed to substitute for a full operator training course.

Customer Responsibilities

The customer should ensure that necessary operating supplies, consumables, and usage dependent items such as vials, syringes, and solvents are available. Users of the instrument should be present at all times during the familiarization; otherwise important information on operation and maintenance may be missed.

Hardware overview

☐ Identify PC hardware and Peripherals

- ☐ Power connections
- ☐ Keyboard, mouse, and monitor connections
- ☐ Printer connections
- ☐ Network connections

☐ Locate and Identify LC/MSD System Hardware

- ☐ Identify LC/MSD components and connections
  - — CDS components and operation
  - — Vacuum system components and review venting requirements
- ☐ Identify electrospray interface components and describe function
- ☐ Identify APCI interface components and describe function

☐ Startup Procedure

- ☐ Switching on the LC/MSD
- ☐ Switching on the LC modules
- ☐ Switching on PC and peripherals

LC/MSD ChemStation Software Overview

☐ Identify ChemStation Software Materials

- ☐ Backup media (CD-ROM)
- ☐ User information: maintenance and repair CD-ROM, Quick Reference, LC/MSD Reference Collection CD-ROM, online help

☐ Starting the ChemStation Software

- ☐ Windows NT overview
- ☐ Keyboard, monitor, and mouse configuration
- ☐ Printer configuration
- ☐ Describe software configuration of the instruments (HP Config editor)
- ☐ Demonstrate use of online Help, both from Help menu and from Diagnosis
- ☐ Demonstrate Maintenance and Repair CD-ROM and LC/MSD Reference Collection CD-ROM
- ☐ Review changing access levels and passwords

☐ LC/MSD Tune View

- ☐ Perform a manual tune and describe the tune procedure (refer to the online help)
- ☐ Save the tune file and discuss the importance of retaining tuning records
- ☐ Generate a tune report and explain how to interpret the report
- ☐ Describe the autotune feature and perform an autotune
- ☐ Demonstrate using Check Tune to verify tune stability and the importance of not tuning more often than necessary
- ☐ Discuss spray chamber contamination and diagnosis of contamination

☐ Method and Run Control View

- ☐ Describe features of the Graphical User Interface (GUI) and pull-down menu items
- ☐ Develop a method with appropriate LC/MSD parameters. Illustrate both scan and SIM acquisition modes. Use method **def_lc.m** as the starting point
- ☐ Review how to save the acquisition parameters as part of a method
- ☐ Review data file structure and how to create a data file using Auto and Prefix/Counter

- ☐ Create a simple sequence table and describe how it can be used to run a batch of samples
- ☐ Inject the performance sample to demonstrate acquiring data as part of the system verification
- ☐ Demonstrate how to take a snapshot

☐ **Data Analysis View**

- ☐ Demonstrate loading UV and MS data files
- ☐ Demonstrate overlaying and separating UV and MS TIC signals
- ☐ Demonstrate zooming in, zooming out, and displaying EIC and UV spectra
- ☐ Demonstrate manual and automatic integration of UV and MS data
- ☐ Describe how to add annotations
- ☐ Demonstrate and describe use of peak purity
- ☐ Discuss the differences and use of offline and online data analysis

☐ **Report Layout View**

- ☐ Create a new report layout using the simple layout example
- ☐ Modify an existing report layout and save it as a style
- ☐ Generate a report using modified layout

☐ **Verification (OQ/PV) View**

- ☐ Review OQ/PV Standard Operating Procedure manual

☐ **Diagnosis View**

- ☐ Describe software diagnostic features
- ☐ Describe software early maintenance feedback (EMF) utility
- ☐ Demonstrate how to access instrument logs

☐ ***If Deconvolution Software is Present***

- ☐ *Generate a deconvolution report*

☐ ***If Protein and Peptide Software is Present***

- ☐ *Demonstrate the function of Peptide Tools with the data provided on the data system*

Maintenance and Support

☐ ChemStation Maintenance

- ☐ Discuss safe storage of software master diskettes and CD ROMs
- ☐ Discuss hierarchy and maintenance of HPCHEM files
- ☐ Discuss data backup options — tape backup, CD-ROM writers, and optical drives; mention importance of security passwords for restoring data
- ☐ Discuss hard disk maintenance, including temp file removal and use of Scandisk; mention importance of using a defragmentation utility (***not*** defrag.exe.)
- ☐ Caution against use of Defrag on NT (truncates long file and folder names)

☐ LC/MSD Maintenance

- ☐ Demonstrate how to use the maintenance CD-ROM and online help
- ☐ Describe proper LC/MSD venting procedure
- ☐ Review LC/MSD operational maintenance procedures
- ☐ Review LC/MSD preventative maintenance procedures
- ☐ Review the use of EMF and instrument logs

☐ Additional Support Information

- ☐ Explain HP support services and how to obtain help
  - — Hardware
  - — Software

4

Supplemental Information

Configuring Windows NT 4.0

Software Configuration Requirements

- Windows NT Workstation revision 4.0 plus Service Pack 4
- NTFS disk partitions, but no compression for active data files
- User accounts and passwords set up
- Minimal desktop configuration (wallpaper, desktop icons)
- TCP/IP networking
- Microsoft Internet Explorer for Internet access
- The system registry should be modified to prevent network session time-out (TCP/IP only), and subsequent loss of network connections:
  - — Run **Windows \ system32 \ regedit32.exe.**
  - — Navigate through the menus following this path:
    HKEY_LOCAL_MACHINE on **Local Machine** | **System** | **CurrentControlSet** | **Services** | **NetBT** | **Parameters** | **SessionKeepAlive**.
  - — With Radix set to Hex, set **Data** to **ffffffff** (eight "F"s).
  - — Click **OK**.
- Not all Windows NT-supported devices are supported for ChemStation products (Magneto-optical devices and CD-ROM writing units are not supported for data collection.)
- SICL driver components from the **HPIB** directory of the ChemStation CD-ROM
- Windows NT 4.0 system recovery disks created at completion of installation

Removing (Uninstalling) the ChemStation Software

Use the following procedure only if you are comfortable with editing system files. Otherwise, ask your system administrator for assistance.

1 **If there are any data, methods, libraries, or other files or directories that you want to save, move or copy them to a directory outside of those to be deleted.**

2 **Close ALL applications except Explorer.**

— In Windows NT Explorer, navigate to C:\Temp.
Select *all* the files and press <**Delete**>. (Do not delete the Temp directory itself.)

— Click **Yes** to send them all to the **Recycle Bin**.

— Delete the file **c:\winnt\system\vhpibd.386**.

— Delete the **\hpchem** directory.

— Drag all ChemStation icons to the **Recycle Bin**.

3 **Click the Start button on the taskbar, and select Run.**

— Type **sysedit** and click **OK**.

— In autoexec.bat, delete the C:\HPCHEM and C:\HPCHEM\SYS references from the **SET PATH=** statement.

— In win.ini, delete the following sections:
[PCS] and **[PCS, #]**, where # may be 1– 4

— In system.ini, delete the following line:
EMMExclude=dc00-dfff

— Save and exit Sysedit.

4 **On the taskbar, click Start with the right mouse button, and select Open All Users.**

— Double-click the Programs icon.

— Right-click the icon for the HP ChemStation group, and click **Delete** (or drag to the **Recycle Bin**).

— Click **Yes** to send the group to the recycle bin.

— Close the C:\WINNT\Profiles window(s).

— Empty the **Recycle Bin** (click the Recycle Bin icon with right mouse button, and select **Empty**).

— Reboot the computer. You are now ready to load new software.

Shutting Down the LC/MSD in Case of Computer Failure

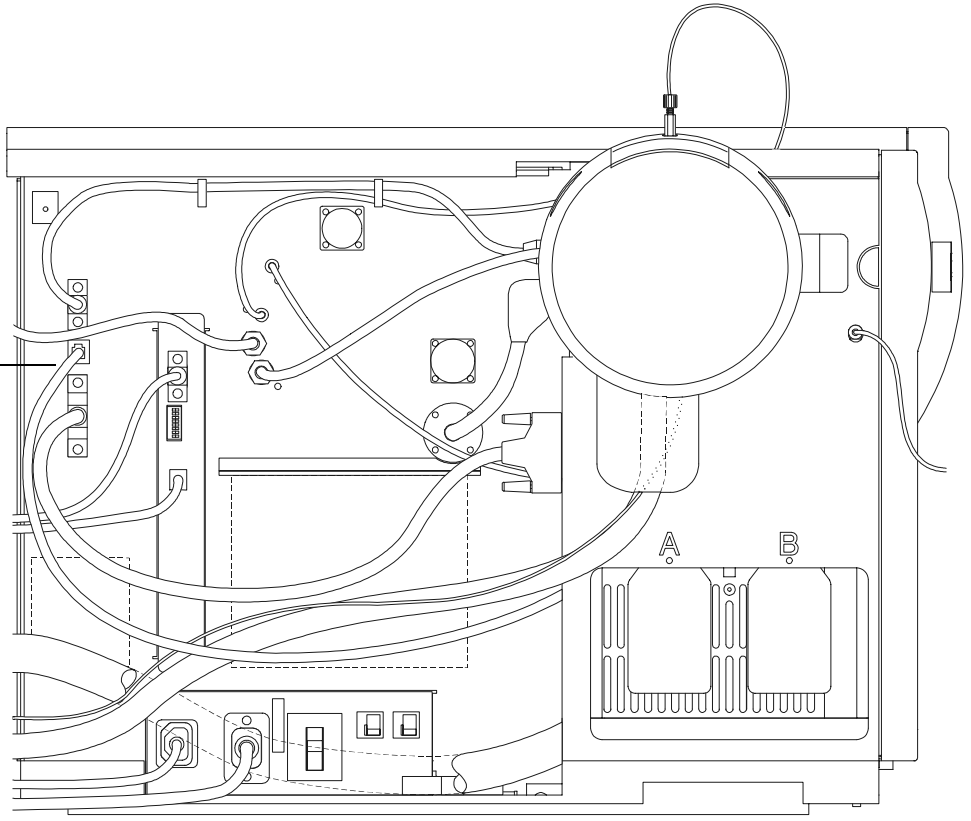
1 **Disconnect the LON cable on the side panel.**

2 **Wait 10 minutes for the turbo pumps to stop.**

3 **Turn off the front LC/MSD power switch.**

4 **Reconnect the LON cable.**

C A U T I O N Do not reconnect this cable with the LC/MSD power on.



LC and MSD Parameters for Installation Verification

Electrospray Positive Ion Sensitivity: MSSUPRES.M

Method Information

Name	MSSUPRES.M
Reserpine SIM method	
ESI Positive Ion Sensitivity Test	

Run Time Checklist	
Pre-Run Cmd/Macro	Off
Data Acquisition	On
Standard Data Analysis	Off
Customized Data Analysis	On
Macro Name	auto_sn -1,,"Reserpine"
Save GLP Data	Off
Post-Run Cmd/Macro	Off
Save Method with Data	Off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	0.400 ml/min
Stop Time	No Limit
Post Time	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

Electrospray Positive Ion Sensitivity: MSSUPRES.M (cont)

Mass Spectrometer Detector

General Information

Use MSD:	Enabled
Ionization Mode	API-ES
Tune File	atunes.tun
Polarity	Positive
Stop Time	No Limit
Peak Width	0.08 min
Scan Speed Override	Not Applicable
Time Filter	Enabled
Data Storage:	Not Applicable
Fragmentor Ramp:	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	609.30	3.0	150	High	460

[MSZones]

Gas Temp	350° C	Maximum 350° C
Drying Gas	10.0 l/min	Maximum 13.0 l/min
Neb Pres	25 psig	Maximum 60 psig
VCap (Positive)	4000 V	

[Time Table]

Time Table is disabled

Electrospray Positive Ion Sensitivity: MSSUPRES.M (cont)

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	Air blank	1
2	2	Solvent blank	5
3	3	10 pg Reserpine	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector Volume	5.0 µl
Auxiliary	
Draw Speed	200 µl/min
Eject Speed	200 µl/min
Draw Position	0.0 mm
Time	
Stop Time	As Pump
Post Time	Off

Electrospray Negative Ion Sensitivity: MSSUPAR4.M

Method Information

Name	MSSUPAR4.M
Acid Red 4 SIM Method	
ESI Negative Ion Sensitivity Test	
Run Time Checklist	
Pre-Run Cmd/Macro	Off
Data Acquisition	On
Standard Data Analysis	Off
Customized Data Analysis	On
Macro Name	auto_sn -1,,"Acid Red 4"
Save GLP Data	Off
Post-Run Cmd/Macro	Off
Save Method with Data	Off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	0.400 ml/min
Stop Time	No Limit
Post Time	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

Electrospray Negative Ion Sensitivity: MSSUPAR4.M (cont)

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	API-ES
Tune File	atunes.tun
Polarity	Negative
Stop time	No Limit
Peak Width	0.08 min
Scan Speed Override	Not Applicable
Time Filter	Enabled
Data Storage	Not Applicable
Fragmentor Ramp	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	357.1	3.0	120	High	460

[MSZones]

Gas Temp	350° C	Maximum 350° C
Drying Gas	10.0 l/min	Maximum 13.0 l/min
Neb Pres	25 psig	Maximum 60 psig
VCap (Negative)	4000 V	

[Time Table]

Time Table is disabled

Electrospray Negative Ion Sensitivity: MSSUPAR4.M (cont)

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	Air blank	1
2	2	Solvent blank	5
3	3	100 pg Acid Red 4	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector Volume	5.0 µl
Auxiliary	
Draw Speed	200 µl/min
Eject Speed	200 µl/min
Draw Position	0.0 mm
Time	
Stop Time	As Pump
Post Time	Off

APCI positive ion sensitivity: MSSUPCI.M

Method Information

Name	MSSUPCI.M
Reserpine SIM Method	
APCI Positive Ion Sensitivity Test	
Run Time Checklist	
Pre-Run Cmd/Macro	Off
Data Acquisition	On
Standard Data Analysis	Off
Customized Data Analysis	On
Macro Name	auto_sn -1,,"Reserpine"
Save GLP Data	Off
Post-Run Cmd/Macro	Off
Save Method with Data	Off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	1.000 ml/min
Stop Time	No Limit
Post Time	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

APCI positive ion sensitivity: MSSUPCI.M (cont)

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	APCI
Tune File	atunes.tun
Polarity	Positive
StopTime	No limit
Peak Width	0.06 min
Scan Speed Override	Not Applicable
Time Filter	Enabled
Data Storage	Not Applicable
Fragmentor Ramp	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	609.30	3.0	150	High	340

[MSZones]

Gas Temp	350° C	Maximum 350° C
Vaporizer	425° C	Maximum 500° C
Drying Gas	6.0 l/min	Maximum 13.0 l/min
Neb Pres	60 psig	Maximum 60 psig
VCap (Positive)	2500 V	
Corona (Positive)	4.0 μA	

[Time Table]

Time Table is disabled

APCI positive ion sensitivity: MSSUPCI.M (cont)

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	Air blank	1
2	2	Solvent blank	5
3	3	10 pg Reserpine	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector volume	5.0 µl
Auxiliary	
Draw Speed	200 µl/min
Eject Speed	200 µl/min
Draw Position	0.0 mm
Time	
Stop Time	As Pump
Post Time	Off

APCI negative ion sensitivity: MSSUP4NP.M

Method Information

Name	MSSUP4NP.M
4-Nitrophenol SIM Method	
APCI Negative Ion Sensitivity Test	
Run Time Checklist	
Pre-Run Cmd/Macro	Off
Data Acquisition	On
Standard Data Analysis	Off
Customized Data Analysis	On
Macro Name	auto_sn -1,,"4-nitrophenol"
Save GLP Data	Off
Post-Run Cmd/Macro	Off
Save Method with Data	Off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	1.000 ml/min
Stop Time	No Limit
Post Time	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

APCI negative ion sensitivity: MSSUP4NP.M (cont)

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	APCI
Tune File	atunes.tun
Polarity	Negative
StopTime	No limit
Peak Width	0.06 min
Scan Speed Override	Not Applicable
Time Filter	Enabled
Data Storage	Not Applicable
Fragmentor Ramp	Disabled

SIM Parameters

Time (min)	Group Name	SIM ion	Gain EMV	Fragmentor	SIM Resol.	Actual Dwell
0.00	Group 1	138.00	3.0	100	High	340

[MSZones]

Gas Temp	350° C	Maximum 350° C
Vaporizer	425°	Maximum 500° C
Drying Gas	6.0 l/min	Maximum 13.0 l/min
Neb Pres	60 psig	Maximum 60 psig
VCap (Negative)	2500 V	
Corona (Negative)	10.0 μA	

[Time Table]

Time Table is disabled

APCI negative ion sensitivity: MSSUP4NP.M (cont)

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	Air blank	1
2	2	Solvent blank	5
3	3	100 pg 4-Nitrophenol	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector Volume	5.0 µl
Auxiliary	
Draw Speed	200 µl/min
Eject Speed	200 µl/min
Draw Position	0.0 mm
Time	
Stop Time	As Pump
Post Time	Off

Multiply-charged ion deconvolution test: MSSUPMYO.M

Method Information

Name	MSSUPMYO.M
Myoglobin FIA Method	
Multiply Charged Ion Deconvolution Test	
Run Time Checklist	
Pre-Run Cmd/Macro	Off
Data Acquisition	On
Standard Data Analysis	Off
Customized Data Analysis	On
Macro Name	auto_sn -1,,"Myoglobin"
Save GLP Data	Off
Post-Run Cmd/Macro	Off
Save Method with Data	Off

HP 1100 High Pressure Gradient Pump 1

Control	
Flow	0.400 ml/min
Stop Time	No Limit
Post Time	Off
Solvents	
Solvent A	100.0%
Solvent B	Off
Pressure Limits	
Minimum Pressure	0 bar
Maximum Pressure	400 bar

Multiply-charged ion deconvolution test: MSSUPMYO.M (cont)

Mass Spectrometer Detector

General Information

Use MSD	Enabled
Ionization Mode	API-ES
Tune File	atunem.tun
Polarity	Positive
Stop Time	No limit
Peak Width	0.15 min
Scan Speed Override	Disabled
Time Filter	Enabled
Data Storage	Full
Fragmentor Ramp	Disabled

RAW Scan Parameters

Time (min)	Mass Range Low	Mass Range High	Gain EMV	Fragmentor	Threshold	Stepsize
0.00	500	1600	3.0	120	0	0.10

[MSZones]

Gas Temp	350 C	Maximum 350 C
Drying Gas	10.0 l/min	Maximum 13.0 l/min
Neb Pres	25 psig	Maximum 60 psig
VCap (Positive)	4000 V	

[Time Table]

Time Table is disabled

Multiply-charged ion deconvolution test: MSSUPMYO.M (cont)

FIA Series

FIA Series in this Method	Enabled
Time Setting	
Time between Injections	1.00 min

FIA Series Table

Line	Vial	FIA Sample Name	Inj/Vial
1	1	air blank	1
2	2	50 pmole Myoglobin	5

HP 1100 Autosampler 1

Injection	
Injection Mode	Standard
Injector Volume	15.0 µl
Auxiliary	
Draw Speed	200 µl/min
Eject Speed	200 µl/min
Draw Position	0.0 mm
Time	
Stop Time	As Pump
Post Time	Off

Safety Information

Safety Class

The HP 1100 Series LC/MSD is a Safety Class I instrument and has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.

WARNING

Connecting an LC/MSD to a power source that is not equipped with a protective earth contact creates a shock hazard for the operator and can damage the instrument. Likewise, interrupting the protective conductor inside or outside the LC/MSD or disconnecting the protective earth terminal creates a shock hazard for the operator and can damage the instrument.

Always use power cords with properly grounded plugs. Ensure that the cables meet your country's standards for safety. This instrument is disconnected from the power by removing the power cords from the power outlets. This means that the power outlets must be easily accessible.

WARNING

For your safety, ensure the supply voltage does not fluctuate more than 10% over the rated voltage. This equipment must be installed in an environment of Category II installation as defined in IEC664.

WARNING

For your safety, never remove covers or perform operations, unless you are instructed to do so by HP learning products. There may be a risk of electric shock or other hazards.

WARNING

Several parts are hot for functional purposes, please allow them to cool down before opening covers.

WARNING

Nitrogen is the only acceptable drying and nebulizer gas. Use of air, oxygen, or other gases, when combined with solvents and high voltages in the spray chamber, could result in explosion.

Always operate the LC/MSD in a properly vented room.

WARNING

Safety glasses, gloves and other protection equipment should be when performing maintenance, as directed in the HP learning products.

Acoustic Noise Declaration

Deutsch

Die folgende Information wird in Übereinstimmung mit den Anforderungen der Maschinenlärminformationsverordnung vom 18. Januar 1991 erteilt. Schalldruckpegel am Arbeisplatz bei normalem Betrieb, Lp < 70 dB(A), nach EN 27779 (Typprüfung).

English

This statement is provided to comply with the requirements of the German Sound Emission Directive, from 18 January 1991. Sound Pressure Lp < 70 dB(A), at operator's position, normal operation, according to EN 27779 (Type Test).

HEWLETT PACKARD

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