Agilent Technologies
622Vu Advisor

User's Guide

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Preface

This manual is directed toward the person who uses Agilent Technologies' 622Vu Advisor application. 622Vu Advisor lets you analyze ATM networks and devices systematically, using a simple Windows-based approach.

The manual assumes you're familiar with:

- ATM technology and the specific components comprising an ATM cell.
- The basics of Microsoft Windows running on an Agilent Advisor. At a minimum, you should be able to:
  - ⇒ Point, click, and double-click using the mouse.
  - ⇒ Select items in a list.
  - ⇒ Open a drop-down list.
  - ⇒ Use scroll bars to scroll within a list or across a window.
  - ⇒ Select a radio button.
  - ⇒ Mark a check box.
  - ⇒ Minimize, maximize, resize, and restore a window.
  - ⇒ Recognize and use standard dialog boxes, such as Open and Save.
  - ⇒ Use menu bars.
  - ⇒ Use toolbars.

Technical Requirements

622Vu Advisor is designed to run on any "C" model of the Agilent Advisor.

Related Materials

Refer to the following manuals or online documents for more information about 622Vu Advisor: In addition, a PDF (Portable Document Format) version of this *User's Guide* is included with the installation, and can be viewed or printed.

Title	Description
622Vu Advisor's Online Help	You can display online Help information at any time, either from the **Help** menu, by pressing F1, or using the Help button on a specific window. Refer to the Help text for all reference information.
622Vu Advisor User's Guide (PDF version)	This manual, available online in PDF (Portable Document Format). The manual can be reviewed or printed from this copy.
Windows Help	If you haven't used Microsoft Windows or Windows-based applications before, work through the Windows Tutorial before using *622Vu Advisor*. You might also want to browse through the Help topics available from Windows. These topics explain general Windows concepts.

Chapter 1
Installation and Configuration

This chapter describes the physical appearance of the 622Vu undercradle. In addition, installation and configuration instructions describe the steps you need to do prior to using the Agilent Technologies 622Vu Advisor application.

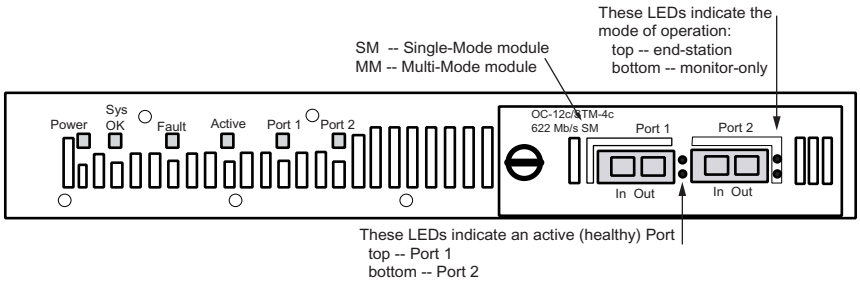
To operate the 622Vu Advisor, the OC-12c/STM-4c application software must be loaded in an Agilent Advisor "C or newer" model and a 622Vu undercradle must be connected to the Advisor.

This chapter contains the following sections:

1.1 622Vu Undercradle Description

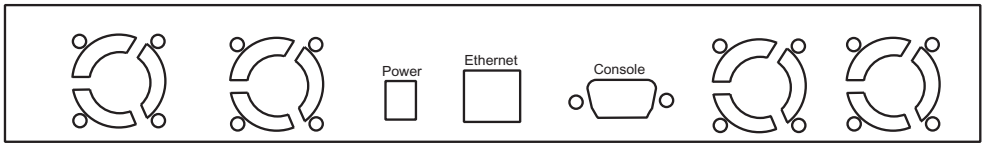
The 622Vu undercradle supports testing an ATM network or device using an OC-12c/STM-4c (SMF) interface. You can use a single-mode or a multi-mode physical interface module in your undercradle.

Right Side



Power	Undercradle Power On indicator.
Sys OK	622Vu Advisor software is running when light flashes.
Fault	There is a hardware or firmware problem.
Active	The 622Vu Advisor application is talking to the undercradle.
Port 1	The undercradle is receiving ATM cells on Port 1. (Dark indicates loss of cell delineation on that port.)
Port 2	The undercradle is receiving ATM cells on Port 2. (Dark indicates loss of cell delineation on that port.)

Left Side



Power	DC Power connector for the power adapter.
Ethernet	Connects to the NIC card in the PC Card slot on the right side of the Agilent Advisor via the supplied crossover Ethernet cable.
Console	Connects to the Serial port on the left side of the Agilent Advisor. Use this connection if you need to troubleshoot the configuration of the undercradle.

1.2 Installing 622Vu Advisor

Two different conditions can exist for installing 622Vu Advisor.

A When you have a new 622Vu undercradle with a new Advisor mainframe. The undercradle is already attached to the mainframe at the factory.

B When you have a new 622Vu undercradle to use with an existing Advisor mainframe.

The following tables show the steps you should use to install Agilent 622Vu Advisor depending on which of these conditions you have.

Each of the steps is described on the following pages. A troubleshooting section is provided after the installation and configuration topics.

A

If you are installing a new 622Vu undercradle with a new Agilent Advisor mainframe.

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B

If you are installing a new 622Vu undercradle with an existing Agilent Advisor mainframe.

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Note: You must install the software before you can proceed with ANY hardware installation.

Step 1.- Install 622Vu Advisor Software

Windows 98 Installation

You need to upgrade to Windows 98 Second Edition if:

- Your Agilent Advisor has software older than version 11.0.

You must have Windows 98 Second Edition (or newer) installed to run 622Vu Advisor.
You can verify this by selecting Start | Settings | Control Panel and then clicking the System icon. In the General tab, verify that you have System version 4.10.2222.A or newer.
See the *Agilent Advisor Software Installation Guide* for instructions.

622Vu Advisor Software Installation

The Agilent 622Vu Advisor application software is included in the 11.0 (and newer) release of Agilent Advisor software.

You need to upgrade to Agilent Advisor 11.0 software if:

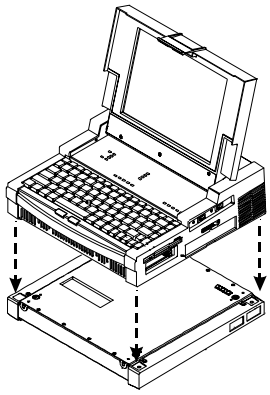
- You have software older than release 11.0.

1. Use Section 4, in the *Agilent Advisor Software Installation Guide,* to add the 622Vu Advisor application software to the Agilent Advisor.
2. If you want to install only the 622Vu Advisor application, in the *Agilent Advisor Software Installation Guide* procedure:
   - Select **J3763A 622 Mb/s Undercradle** for the hardware
   - Select **622Vu Advisor** for the software application
   - Select the **LAN in Windows** software application
   - Select **all the System files** for the software application

Step 2. - Install 622Vu Undercradle

To attach the 622Vu undercradle to your Agilent Advisor:

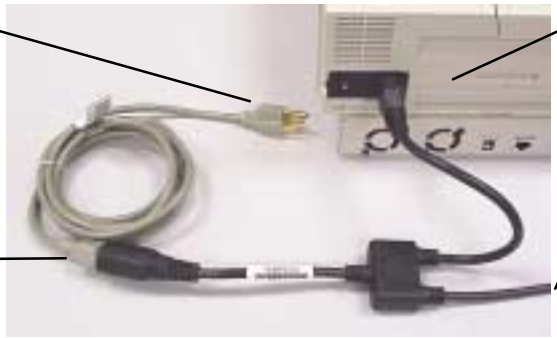
1. Turn the Advisor off and disconnect the power cord.
2. Align the undercradle with the Advisor so the connector slots match.
   Tip: The network connections and indicator lights are on the right side of the undercradle.
3. Press the undercradle and Advisor together until they are seated.
4. Push in the four silver tabs to lock the undercradle to the Advisor.



Step 3. - Connect AC Power to the Mainframe

3. Connect the AC power cord to a power outlet.

2. Connect the AC power cord to the Y cord power.



1. Connect the Y cord power jumper to the Advisor.

You will make the DC connection in a later step.

Step 4. - Ensure CardBus Controllers Are Enabled

The 622Vu undercradle communicates with the Advisor via an Ethernet interface card in the PC CardBus slots. The following procedure verifies that the card slots are enabled.

1. Turn the Advisor power switch on (the undercradle is powered on later).
2. Select Start | Settings | Control Panel and then click the System icon.
3. Click the Device Manager tab.
4. Expand the PCMCIA socket item. Two CardBus Controller items should be listed. If a red X is displayed on either icon for the controllers, do the following steps:
   a. Click on a CardBus Controller item that has a red X.
   b. Click the Properties button.
   c. In the General tab, locate the Device Usage group.
   d. Make sure that the "Disable in this hardware profile" item does NOT have a checkmark.
   e. Click OK.
   f. At the PC Card Wizard prompt, "Are you using a PC card (network card, CD-ROM connected to a SCSI card, etc.) to install Windows?" select No and then click Next.
   g. At the PC Card Wizard prompt, "Do you want to review your system files and select real-mode PC card drivers so Windows can disable them?" select No and then click Next.
   h. Click Finish.
   i. Click the No button at the prompt to shut down Windows to finalize the setup.
   You will shut down Windows after the second CardBus Controller is enabled.
   j. Repeat these steps for the second CardBus Controller item.
   k. At the prompt to shut down Windows to finalize the setup of the second CardBus Controller, click the Yes button.
5. If you had to enable the CardBus controllers in the step above, shut down and then restart the Advisor.

Step 5. - Ensure TCP/IP Stack Is Installed

If you have just installed Windows and/or the Agilent 622Vu Advisor application, use the following steps to verify that the TCP/IP stack is enabled.

1. Select Start | Settings | Control Panel and then click the Network icon.
2. Click the Configuration tab.
3. Scroll the component list and look for a TCP/IP item.
4. If the TCP/IP protocol item is listed, click OK, wait for any open dialogs to close, then close the Control Panel, and go to the next procedure.
5. If the TCP/IP protocol item is not listed, do the following steps:
    a. Click the Add button.
    b. Click the Protocol item.
    c. Click the Add button.
    d. In the Manufacturers column, click Microsoft.
    e. In the Network Protocols column, click the TCP/IP item.
    f. Click OK.
    g. Scroll the list to see if the TCP/IP item is listed.
    h. Click OK to close the Network dialog.
    i. If a Version Conflict dialog displays a message that an old file is being copied over a newer file, choose the option to keep the newer file.
    j. At the prompt to shut down Windows to finalize the setup, click the Yes button.
    k. Shut down and then restart the Advisor.

Step 6. - Install the Ethernet Card

The Xircom RealPort™ CardBus Ethernet 10/100 Network Interface Card (NIC) is supplied and supported for operation with the Agilent 622Vu Advisor. Use the following steps to install the card.

1. Turn the Advisor on and wait for the Windows desktop to display.
2. If this is a new Advisor, several screens prompt for information to complete the configuration. Answer the prompts. At the Certificate of Authenticity prompt, use the number located on the front cover of the *Getting Started Microsoft Windows 98* book shipped with your Agilent Advisor.
3. Insert the Xircom CardBus card in the PC Card slot of the Advisor.

4. If the drivers are not already installed, you should see several drivers being installed.

   Note: If a Version Conflict dialog displays a message that different versions of files are being copied, read the message carefully and click the option to keep the newer file.
5. Wait for the New Hardware Found dialog to close.
6. In the DHCP Client dialog, click No.
7. Select Start | Settings | Control Panel and then double click the PC Card (PCMCIA) icon.
8. Click the Socket Status tab.

   "Xircom CardBus Ethernet 10/100 Adapter – Socket 1" should be listed.

If this item is not listed, see The CardBus NIC Card Is Not Detected During Installation on page 28 in the troubleshooting section.

9. Click OK to close the Socket Status window.
10. Close the Control Panel window.

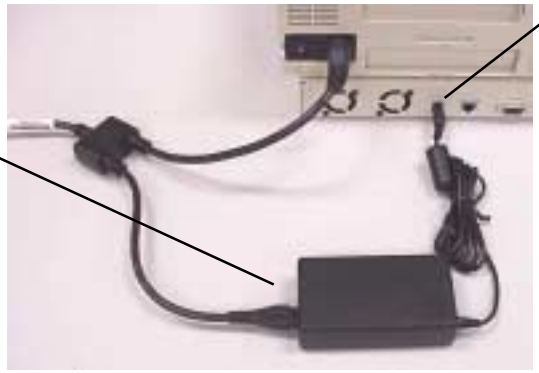
Step 7. - Connect the 622Vu Undercradle to the Ethernet Card

1. Connect one end of the provided Ethernet crossover cable to the Ethernet connector on the left side of the undercradle.

2. Connect the other end of the provided Ethernet crossover cable to the Ethernet network interface card (NIC) on the right side of the mainframe.

Step 8. - Apply DC Power to the 622Vu Undercradle

1. Connect the Y cord power jumper to the power supply module.



2. Connect the power supply module output to the Power connector on the undercradle.

1.3 Configuring 622Vu Advisor

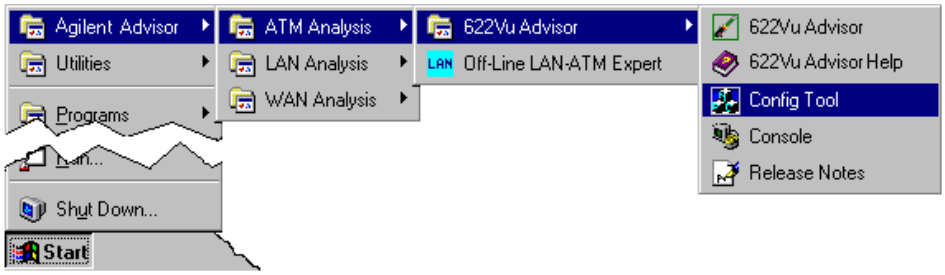
Step 9. - Set IP Addresses

The first time you install the Xircom CardBus Ethernet card, you must set its IP address and Subnet Mask. The 622Vu undercradle and the Advisor default addresses are:

	Default IP Address	**Default Subnet Mask**
Agilent Advisor	15.21.191.200	255.0.0.0
622Vu Undercradle	15.21.191.201	255.0.0.0

Use the Registry Configuration application to set the IP Addresses for the Advisor.

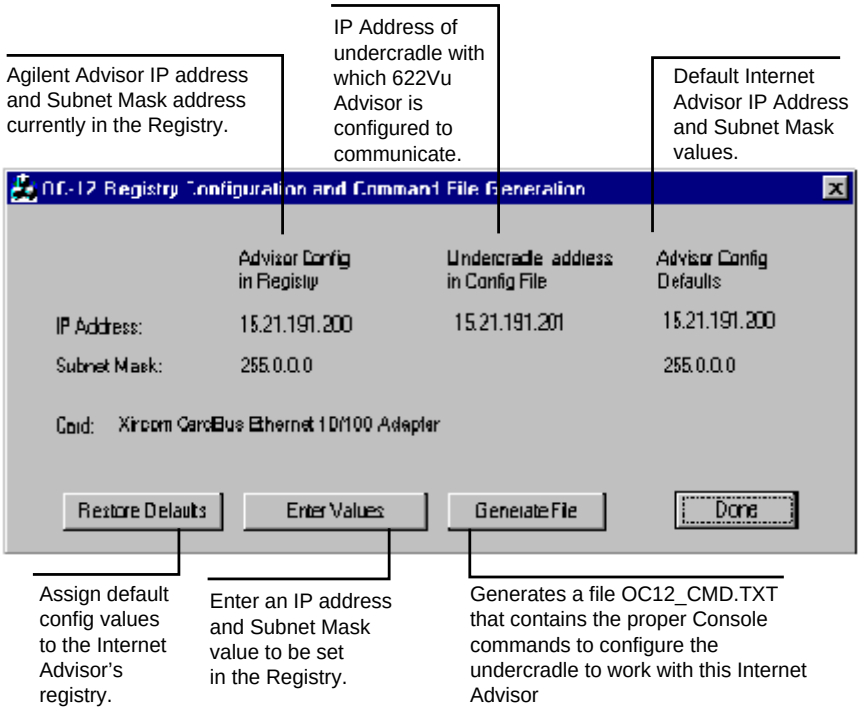
1. Start the Registry Configuration application.



Note: The address values for the Xircom CardBus card configuration are stored in the registry and are listed in the “Advisor Config Defaults” column.

2. Click the Restore Defaults button to assign the default values and click Done.

The following figure provides explanations about the screen's contents and controls.



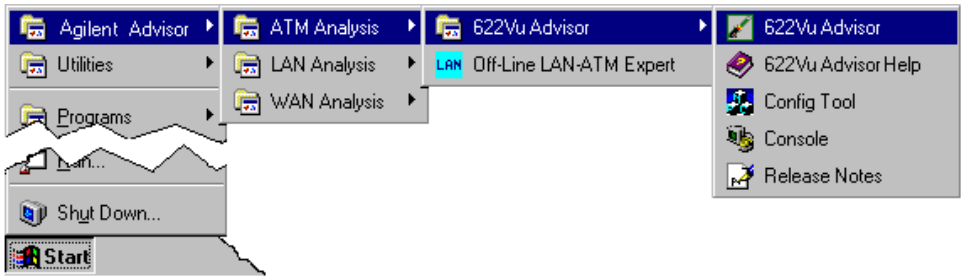
3. Click OK to accept the new settings.
4. Select Start | Shut Down; restart the Agilent Advisor.

1.4 Testing the Installation and Configuration

Use this section to verify that the 622Vu Advisor application and undercradle are correctly installed and configured.

Step 10. - Test the Installation and Configuration

1. Use the Start menu to start the application; a toolbar is displayed.



2. Click the Manage Devices  toolbar button to display the Device Manager window.

3. Click the 622Vu#1 item in the left pane of the window.
   This item will not display if the undercradle is not installed properly. See Undercradle Not Detected by the 622Vu Application on page 25.

4. Verify that the Serial No., MAC Address, and ATM Address fields are not blank in the Device and Network groups.

5. Verify that the undercradle has been recognized as “OC-12c / STM-4c MMF (or SMF) in the Hardware Specifications group.

6. If the undercradle was found and the field contents are correct, you are finished with the installation and configuration.

   See chapters 2 and 3 for introductory and getting started information.

7. If no 622Vu undercradle is found, a message displays "Sorry - no CellCards have been detected. Please check your configuration and try again.", go to the following Troubleshooting section.

1.5 Troubleshooting

Configure Standard Modem

This section describes configuring a standard modem so that you can use the Console application to troubleshoot the 622Vu Advisor application.

Troubleshooting Problems

This section covers several potential problems you may see during installation and operation of the 622Vu Advisor. These problems include:

- Undercradle Not Detected by the 622Vu Application
- The NIC Is Not Detected During Installation
- Problems With Console

Useful Troubleshooting Tools

Several tools are provided with the 622Vu Advisor application to help you test and configure the 622Vu Advisor. These tools include:

- Ping
- Configure Registry
- Console

Configure Standard Modem

In the 622Vu Advisor's start menu, the Console selection runs the Hyper-Terminal application so you can view and configure the 622Vu undercradle's parameters.

Even though the connection from the Advisor to the 622Vu undercradle is a direct serial connection, the Hyper-Terminal application requires a default modem to be configured. To enable the Console selection to run without error, you need to add a modem.

To add a modem:

1. Select Start | Settings | Control Panel, double click the Add New Hardware icon, and then click Next.
2. At the prompt to search for new hardware, select No and then click Next.
3. In the Hardware Types list, click Modem and then click Next.
4. Put a checkmark in the box labeled "Don't detect my modem: I will select it from a list."
5. Click Next.
6. Click Standard Modem Types in the Manufacturers box.
7. Click any choice in the Models box and then click Next.
8. Click any choice for the port to use with the modem and then click Next.
9. If the Location Information dialog displays, enter your dialing information and click Next.
10. Click Finish and then close the Control Panel window.

When you want to use the Console application, select:

Start | Agilent Advisor | ATM Analysis | 622Vu Advisor | Console

Troubleshooting Problems

Undercradle Not Detected by the 622Vu Application

When you try to start the 622Vu Advisor's Device Manager and a message displays, "Sorry - no cell cards have been detected. Please check your configuration and try again." displays, try the following steps:

1. Click the Refresh  toolbar button to refresh the 622Vu Advisor's Device Manager window contents.

   Wait a few seconds to see if the Device Manager detects the undercradle. Refreshing may work if the undercradle had not finished booting when the Device Manager first began its search for the undercradle.

2. Check if the DC power adapter is connected to the 622Vu undercradle.
   The Power LED on right side panel should indicate the undercradle has power.
   The Sys OK LED should be flashing to indicate normal operation of the undercradle.

3. Check the cable connections between the Ethernet connector on the left side panel and the Ethernet NIC card inserted in the PC Card slot.
   You must use the supplied crossover cable for this connection.

4. Check if the Ethernet NIC card is operating properly.

   a. In the Windows desktop, select Start | Settings | Control Panel and then double click the System icon.

   b. Click the Device Manager tab.

   c. Expand the Network Adapters line.

   d. Select the Xircom Ethernet Adapters 10/100 item.

   e. Click the Properties button. The Device Status group should indicate "This device is working properly."

5. Use the Console application to view the power-up sequence.
   Note: The Console application is described in more detail in the following Useful Troubleshooting Tools section of this chapter.

   a. Use the provided cable to connect the Console connector on the 622Vu undercradle to the Serial connector on the Advisor.

b. Start the Console application.
Note: The Console application requires that a default modem is configured. See Configure Standard Modem on page 24.

c. Close the 622Vu Advisor application and disconnect power from the 622Vu undercradle.

d. Connect power to the 622Vu undercradle and observe Console messages.

Are power-up messages displayed?

Did the "auto-sensing" of the Ethernet connection work? For example, did you see a "100 MB Link Established" message?

e. If no messages display, or pressing Enter does not display the ">>" prompt, check the cabling between the undercradle Console connection and the Serial connector.

Are you using the provided (null-modem) cable?

Are the connectors firmly attached?

Is the power on and is the Power LED on?

6. Gather information about the Agilent Advisor and the 622Vu undercradle.

Agilent Advisor	In the Start menu, select
	Agilent Advisor | ATM Analysis | 622Vu Advisor | Config Tool.
	
	Verify if the registry information is correct. The default information shows:
	`Agilent Advisor` `Undercradle Address in Config file`
	`IP Address 15.21.191.200 15.21.191.201`
	`Subnet Mask 255.0.0.0`

622Vu Undercradle	Connect the provided cable between the Console connector on the undercradle and the Serial port on the Advisor.
	In the Start menu, select
	Agilent Advisor | ATM Analysis | 622Vu Advisor | Console.
	Verify if the IP Address, Subnet Mask, and Gateway addresses are correct. Do this by typing commands on the console.
	
	`COMMAND DEFAULT RESULTS`
	`show ipaddr 15.21.191.201`
	`show mask 255.0.0.0`
	`show gateway gateway: 15.21.191.200`
	`host/network: 15.21.191.200`

7. If the undercradle's settings on the previous step are not correct, use the Console application to edit the IP Address or Subnet Mask. Then power down and power up the undercradle and repeat step 6 to test the undercradle.
8. If the Advisor's settings in step 6 are not correct, use the Config Tool to modify the IP Address or Subnet Mask. Then restart the Advisor and repeat step 6 to retest the Advisor.
9. If the address of the undercradle in the Config Tool application does not match the undercradle, start the 622Vu Advisor application.
    a. Click the Manage Devices  toolbar button.
    b. Select Tools | Configure Server List.
    c. Highlight the IP Address and click the Edit button.
    d. In the Remote Server Information dialog, edit the IP Address and click OK.
    e. Close the Remote Server List dialog.
    f. Restart the Advisor and repeat step 6 to retest the Advisor.
10. The section Useful Troubleshooting Tools on page 31 describes how to use Ping to see if the Advisor can find the undercradle.

If you still have problems, call 1-800-698-0061 for support or contact your local Agilent Technologies Sales and Service Office.

The CardBus NIC Card Is Not Detected During Installation

The 622Vu undercradle communicates with the Agilent Advisor via an Ethernet NIC card in the PC CardBus slot. If you have trouble installing the provided NIC card, you may be having a conflict between the Xircom CardBus NIC card drivers and other installed NIC card drivers.

Try the following steps to isolate the problem.

1. Shut down the Advisor and turn the power off.
2. If an Agilent J2901 Gigabit undercradle is attached to the Advisor, remove the undercradle.
3. Turn the Advisor on and as soon as the memory count is complete, press the F8 key a couple of times.
4. Select item 3 “Safe Mode” from the Microsoft Windows Startup Menu.
5. Answer OK to the safe mode warning.
   Note: In Safe Mode, the serial mouse may not be functional. Therefore, the following instructions are for the keyboard. If you have a functioning serial mouse, you can use it instead of the keyboard.
6. Use the Microsoft Window key to bring up the Start Menu.
7. Use the arrow keys to launch the Control Panel.
8. Use the arrow keys to launch the System icon.
9. Use CTRL + TAB to select the Device Manager tab.
10. Use the arrow keys to select “Other devices”.
11. Use the right arrow to open the “Other devices” list.
12. Examine the devices in the “Other devices” list and with the exception of the devices listed in Note below, delete every device in the “Other devices” list by using the following steps:

    Note: Do <u>NOT</u> delete the following devices.

    - **Agilent J2524 FDDI Interface for Advisor LAN**
    - **Agilent Advisor Plug & Play Driver**
    - **PCMCIA Card Services**

    a. Use the arrow keys to highlight an entry to delete.

    b. Press the delete key (Del).

    c. Press Enter (OK) to confirm the device removal.

d. Repeat steps 9 thru 11 until all devices have been removed from the "Other devices" list.
Remember, the devices listed in the Note above should not be deleted.

13. Use the Tab key to highlight the Close button and press Enter.
14. Use Alt+F4 to close the Control Panel window.
15. Use the Microsoft Window key to display the Start Menu.
16. Use the arrow keys to Shut Down the system.
17. Turn the Advisor power off.
18. Turn the Advisor power on.
19. Use Windows Explorer to go to directory `C:\Windows\Inf` and delete the following files\directories:
    - `fx1k.inf`
    - `xi_cfg.inf`
    - `xi_desc.inf`
    - `xi_mem.inf`
    - `xi_stat.inf`
    - `drvdata.bin`
    - `drvdx.bin`
    - `Other` (directory)
20. Shut down the Advisor and turn the power off.
21. Turn the Advisor power on.
22. Insert your CardBus NIC card.

Problems With Console

The Console application provides a remote terminal to view and edit parameters in the 622Vu undercradle. If the Console application is not communicating with the undercradle, try the following steps.

1. Use the provided cable to connect between the Console connector on the undercradle and the Serial port on the left side of the Advisor.
2. A modem must be configured. If you get the message:
   "Could not read session file: %S", you have not configured a standard modem,
   a. Use the procedure, Configure Standard Modem on page 24, to configure a modem.
3. If you have a Serial Mouse connected to the Serial port:
   Remove the Serial Mouse from the Serial port.
   Power down, then power up and use the keyboard mouse.

Useful Troubleshooting Tools

Several tools are available to troubleshoot the 622Vu Advisor operation with the 622Vu undercradle. Each of these tools is described below.

Ping

You can use the Ping function to test if the Advisor can reach the 622Vu undercradle.

1. At the MS DOS prompt, type:
   ping 15.21.191.201 and press Enter.
   This is the default IP address of the 622Vu undercradle.

   You should see a timing information about the Ping test if it is successful.

2. If you get messages that the Ping test failed, try the following steps:

Request timed out	If the request times out, you can conclude that the NIC card is installed properly. You can now question the operation of the undercradle and the supplied crossover cable. To verify the cable's operation: Power On LED should be on. Sys OK LED should be flashing. Use the Console application as described in the "Undercradle Not Detected" procedure in the "Troubleshooting Problems" section of this chapter.

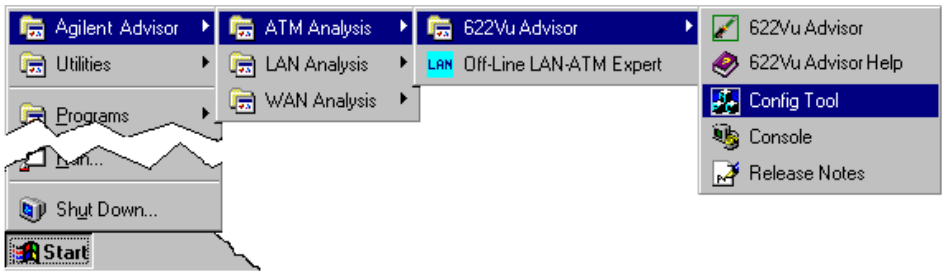
Destination Host Unreachable	This message makes you question the installation and configuration of the NIC card. The message tells you that the Advisor did not "know" which NIC card to use to reach the Ping destination.
	The Registry Configuration tool can show you the currently set IP Address and Subnet Mask of the installed NIC card.
	`                          Undercradle address`
	`            Agilent Advisor     in Config file`
	`IP Address   15.21.191.200       15.21.191.201`
	`Subnet Mask  255.0.0.0`
	If these values look proper:
	Uninstall all PCMCIA/PC CardBus card drivers.
	Reinstall the provided Xircom CardBus Ethernet NIC card.
	Use the procedures in the earlier installation and configuration topics to verify the TCP/IP stack is installed and verify IP addresses of the undercradle and the Advisor.
	Repeat the Ping test.

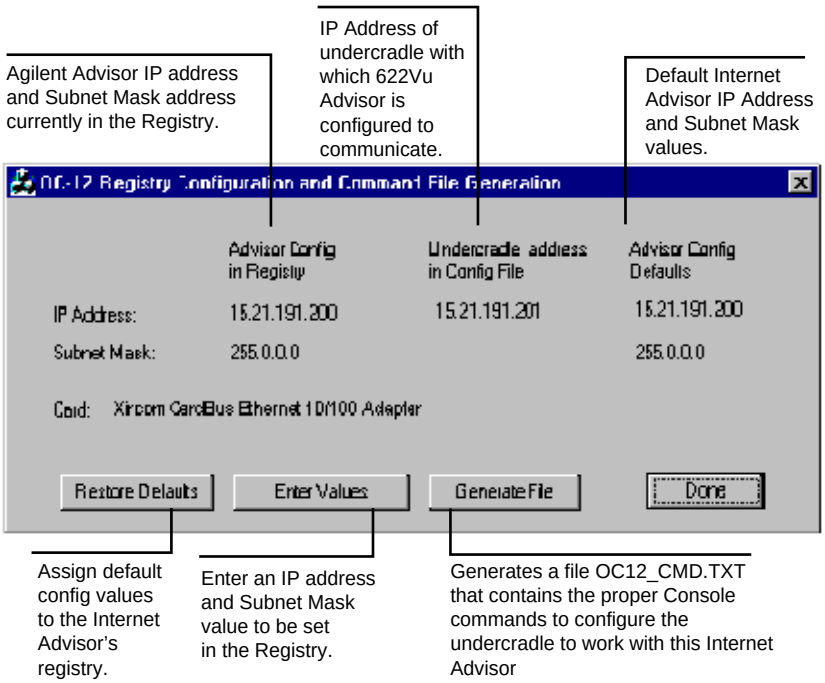
3. If you make any changes that allow Ping to operate successfully, try the 622Vu Advisor application again to see if it now can retrieve undercradle information.

Registry Generation and Command File Generation Tool

The Config Tool application lets you view and edit the registry for addresses currently being used by the Advisor. You can also view the address the Advisor is currently using to communicate with the 622Vu undercradle.

1. Start the Config Tool application.





2. You can use the Console application in conjunction with the generated OC12_CMD.TXT file to configure the 622Vu undercradle's IP, Subnet Mask, and gateway addresses.

   See the topic "Use of Generated File" later in this troubleshooting section.

Note: In the 622Vu Advisor's Device Manager view, use the Tools | Configure Server List item to edit what 622Vu undercradle IP address is used as the destination undercradle address.

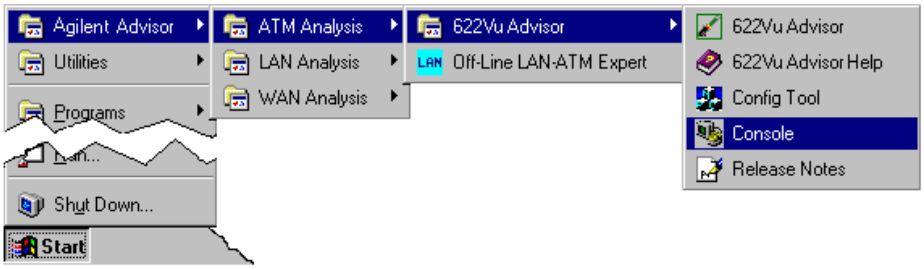
Console

The Console connection is not needed for normal operation of the 622Vu Advisor. It is used mainly to let you view and edit the IP, Subnet Mask, and gateway addresses stored in the 622Vu undercradle's flash ROM.

Note: The Console application requires that a default modem be configured. See Configure Standard Modem on page 24

To start the Console application:

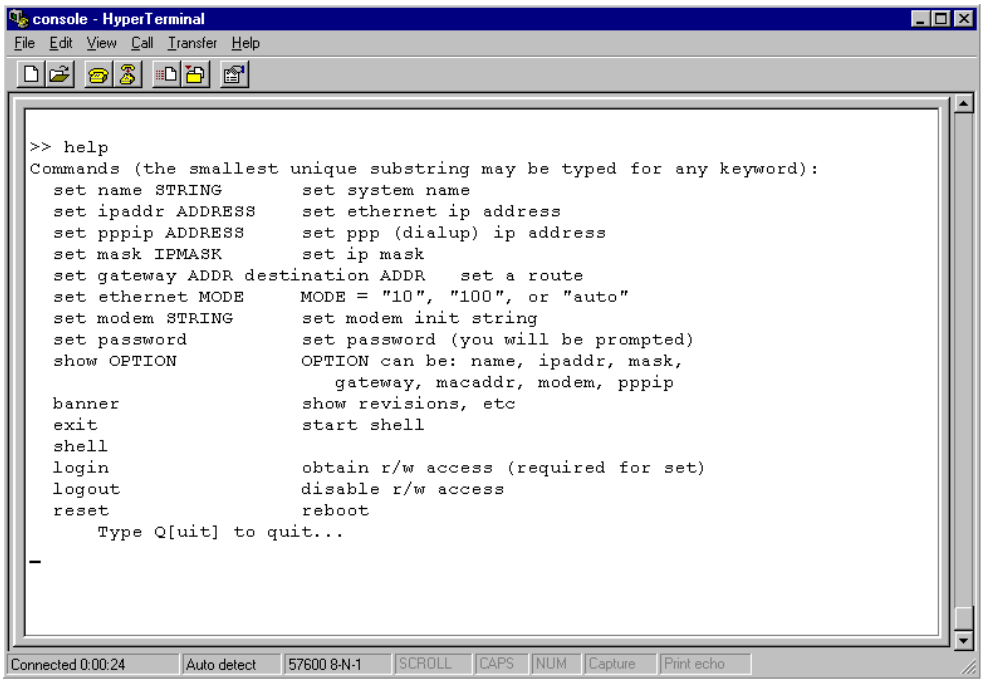
1. Use the provided cable to connect the Console connection on the 622Vu undercradle to the Serial connection on the Advisor.
2. Start the Console application:



3. Press the Enter key to display the ">>" prompt.

Console Commands

4. Type `help` and press Enter to display console commands for controlling the 622Vu undercradle parameters.



5. For example, the "show" and "set" commands are useful to view existing parameters and to edit the parameters to new values.

Command	Action / Default
set ipaddr *n.n.n.n*	Set the IP address of the 622Vu undercradle to *n.n.n.n* Default = 15.21.191.201.
set mask *n.n.n.n*	Set the subnet mask to *n.n.n.n*. Default = 255.0.0.0
set gateway *n.n.n.n* destination *n.n.n.n*	Set the gateway and destination IP Address to that of the controlling Agilent Advisor that communicates with the undercradle. Default = 15.21.191.200 15.21.191.200
show *setting*	Show the value of the specified setting, which can be: *name*, *ipaddr*, *mask*, *gateway*, or *macaddr*.
banner	Display version information.
reset	Restart the system.

6. Press Enter in the terminal window to start the command line interface.

7. Use the **set ipaddr** command to set the 622Vu undercradle's address. For example:

   ```
   set ipaddr 15.21.191.201
   ```

8. Use the **set mask** command to set the 622Vu undercradle subnet mask. For example:

   ```
   set mask 255.0.0.0
   ```

9. Use the **set gateway** command to set the IP addresses of both the gateway and the Agilent Advisor. For example:

   ```
   set gateway 15.21.191.200 destination 15.21.191.200
   ```

10. Enter **reset** to restart the system with your new settings.

Remove the Console cable.

11. Close the Console application.

Use of Generated File

In addition to the previous procedure to manually set the controlling Agilent Advisor's IP Address, Subnet Mask, and Gateway/destination IP address, you can do the same configuration via a generated file of commands. This file is generated when you press the "Generate File" button in the Config Tools application.

The Generate File button takes the information contained in the Advisor's registry and the 622Vu Advisor application's configuration file and generates a text file of console commands. The generated file is `OC12_CMD.TXT`.

When you have created the `OC12_CMD.TXT` file, use the Console application and select Transfer | Send text File to send the commands in the text file to the undercradle just as though they were typed in.

Chapter 2
Introduction

622Vu Advisor is a full bandwidth, Asynchronous Transfer Mode analysis and management system. It's designed for use by network managers, technicians, and development engineers involved with all aspects of ATM technology. *622Vu Advisor* lets you monitor, analyze, and manage the physical interface to each ATM device, as well as the traffic passing through each port.

This manual uses the terms port and channel interchangeably when channel refers to the actual physical connector on the Agilent Advisor system.

CAUTION: *622Vu Advisor is very powerful!* It allows extensive analysis of any problem that might occur during ATM transmissions. Because of this, *622Vu Advisor* lets you transmit anything; it assumes that any bad or broken data introduced into cells or packets is being introduced intentionally. (From the analysis standpoint, a corrupted cell may be what you want.) It's important, then, that you fully understand all the implications of *622Vu Advisor*'s operation.

2.1 Overview of Processing

Monitor Mode vs. End Station

You can operate 622Vu in *monitor mode* or as an *end station*:

- When operating in **monitor mode**, the 622Vu Advisor passively observes the traffic flow coming through it, optionally capturing some or all traffic for further analysis.
- In **end-station mode**, the 622Vu Advisor is a known, visible end station on the network, capable of transmitting ATM cells, *ping* messages, and QoSMeter tests, as well as monitoring and capturing traffic as it's received.

Capturing Traffic

In either mode, 622Vu lets you capture traffic as it moves through the analysis device, and analyzes the functional characteristics of the ATM DUT (device under test) as reflected by that traffic.

You can filter the incoming traffic if you wish, to restrict the capture to certain types of cells or specific paths, or simply to restrict the amount of memory used to store captured cells. 622Vu offers a variety of filtering capabilities, including real-time filtering by IP address, VCC, and/or protocol.

After a capture finishes, you can search the capture file for specific values, create (and save) virtually any subset(s) of the captured cells or PDUs, and optionally turn the capture (or subset) into a script that you can then send over the network for further analysis. If you save a capture file, you can then export it in any of several formats: full textual decode, the standard 622Vu format, or Network Associates Sniffer format

Real-time Statistics

Any time you're not capturing traffic actively, 622Vu lets you monitor real-time statistics for the link attached to an analysis device. At your request, it displays the active network connections on the link, providing statistics in a tabular fashion so you can track bandwidth use easily. It also offers a graphing capability, so you can lay out the statistics in graphical form.

Each time 622Vu detects a new connection, it displays the corresponding VP/VC identifiers and begins tracking statistics for that connection. If you notice a

problem while monitoring the statistics, you can begin capturing any particular VCC(s).

Scripts

While in end-station mode, you can send out *transmission scripts* over the network. Each script comprises a predefined, specific pattern of standard ATM transmissions (i.e., transmit sequences and timed pauses). You can monitor a link as the script traffic passes through it, and optionally capture that traffic on another analysis device.

Ping Tests

Also while in end-station mode, you can transmit standard *ping* messages through an ATM network, targeting a specific destination address. You can monitor the results as responses come back for these messages, tracking packet counts and latency information.

QoSMeter Test Sessions

While in end-station mode, too, you can send *QoSMeter sessions* over a particular virtual circuit. Each QoSMeter test session comprises a series of identical tests, with the test itself defined as *some amount of traffic* that's transmitted using a *certain percent of available bandwidth*. The traffic is analyzed by a receiving device, and the results can be monitored from your PC.

2.2 Specific Capabilities

622Vu lets you:

- Configure analysis devices.
- Monitor physical ATM ports while they send/receive traffic, allowing you to observe the characteristics of the physical interface to ATM devices.
- Capture and examine traffic as it enters the analysis device. You can capture all traffic or only selected traffic, as controlled by 622Vu's optional filtering capability. This filtering capability allows you to restrict the capture to only certain types of cells or specific paths, and/or to restrict the amount of memory used to store captured cells. 622Vu offers a variety of filtering capabilities, including real-time filtering by IP address, VCC, and/or protocol.
- Manipulate files of captured cells: to create subsets of the cells and/or PDUs, to locate specific information within the captured traffic, to generate scripts (groups of cells) to send out over the network for further analysis, and so forth.
- Save captured traffic (or a subset of a particular capture). If you save a capture file, you can then export it in any of several formats: full textual decode, the standard 622Vu format, or Network Associates Sniffer format.
- Send out scripts (available only in end-station mode), where each script comprises a predefined, specific pattern of ATM traffic (transmit sequences and timed pauses).
- Generate *ping* messages to verify connectivity to remote end stations through an ATM network.
- Send data over a particular virtual circuit (available only in end-station mode), to test the quality of service over that VCC. This is known as *QoSMeter testing*, and emphasizes analysis of *variations in cell delay* and *latency of data transmission*.
- Monitor real-time statistics for the link attached to an analysis device (available any time, unless you're actively capturing traffic). At your request, 622Vu displays the active network connections on the link, providing statistics in a tabular fashion so you can track bandwidth use (and error counts) easily. It also offers a graphing capability, so you can lay out the statistics in graphical form. If you notice a problem while monitoring the statistics, you can begin capturing any particular VCC(s).

2.3 How Does It Work?

622Vu Advisor lets you analyze ATM networks and systems systematically, using a simple Windows-based approach. To do this, it passes requests to the 622Vu Advisor hardware through the ***CellCommand*** server interface:

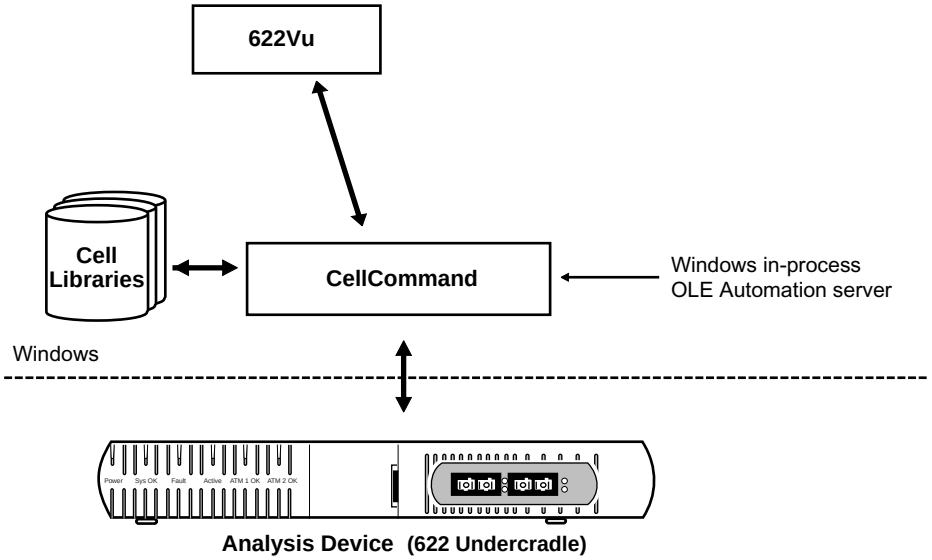


Figure 1. 622Vu Advisor's Component Architecture

The cell library, shown to the left of CellCommand in Figure 1, serves as a repository for various 622Vu Advisor information: sequence definitions (groups of cells), script definitions (groups of sequences and timed pauses), filterset definitions, QoSMeter test sessions, etc. 622Vu Advisor can manage any number of cell libraries, but only one library is open (*active*) at any given time.

2.4 Where To Go From Here

Other chapters in this manual describe how to use 622Vu Advisor to perform specific tasks, and how to use the *ping*-message generation tool:

For Instructions to…	See Chapter…	Page
Install and configure the 622Vu Advisor software and the 622Vu undercradle.	1	9

For Instructions to…	See Chapter…	Page
Get started with 622Vu Advisor, including use of its menus, toolbars, user profiles, and general processing information.	3	43
Instructions to configure analysis device(s). Includes specifics related to the physical interface (OC-12c/STM-4c).	4	55
Monitor the characteristics of the physical interface to each ATM port as traffic flows through that port.	5	67
Capture traffic as it moves through the network; specifically, as it enters the incoming channel on an analysis device. Includes instructions to manipulate the captured cells upon completion of the capture (to create subsets of the capture, search for specific data, generate scripts from the data, etc.).	6	77
Monitor real-time statistics for the link attached to an analysis device.	7	117
Use 622Vu Advisor's filtering capability to restrict the cells that are saved in a capture, and/or to control the use of available capture memory.	8	131
Define sequences (groups of cells) that you can send out over the network to analyze ATM networks.	9	153
Define and run scripts, where each script comprises a predefined series of sequences and timed pauses that can be sent over the network in a controlled manner.	10	171
Generate *ping* messages to verify connectivity to remote end stations through an ATM network.	11	181
Define and run QoSMeter test sessions to analyze the quality of service over a particular VCC.	12	185

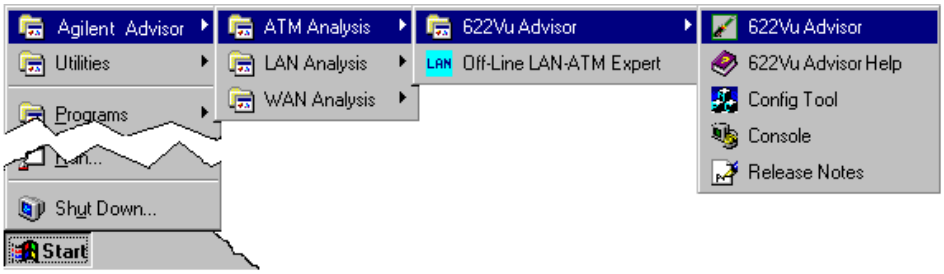
The appendixes present information as follows:

Appendix	Description
A: Glossary	Definition of terms.
B: config.ini File	Listing of the initialization file installed with 622Vu Advisor.
C: Summary of Libraries	Description of the cell libraries distributed with the system.
D: Cell Library Structure	Description of the internal structure of 622Vu Advisor's libraries.
E: Regulatory Information	Regulatory information and Declaration of Conformity.

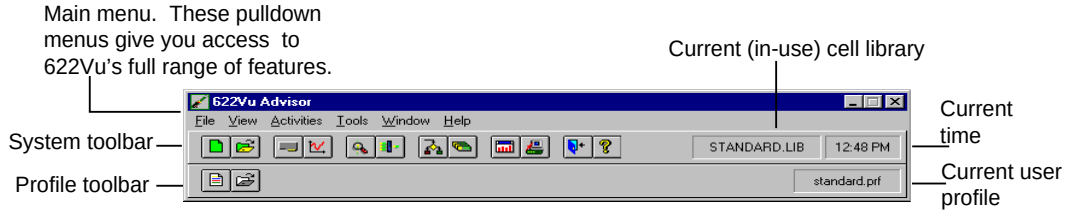
Chapter 3
Getting Started

622Vu
startup icon

To start 622Vu Advisor, either double-click its shortcut icon (shown to the left), or choose it from the Agilent Advisor Windows **Start** menu.



622Vu Advisor opens its main toolbar:



Use the pulldown menus to direct your processing, as described starting on page 45. As an alternative, use the toolbars to choose the processing you want through a simple point-and-click method:

- The **system toolbar** lets you choose the most commonly used commands easily. It also displays the name of the current (in-use) cell library, and the time.

  The first and last command groups on the system toolbar deal with housekeeping functions, and are covered in this chapter. The commands in the center of the toolbar let you direct 622Vu Advisor's capabilities, and are detailed in subsequent chapters.

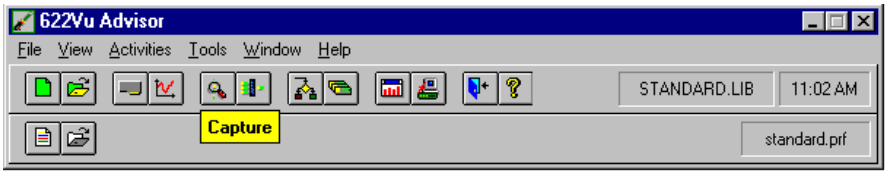
- The **profile toolbar** lets you establish user profiles that tailor the 622Vu Advisor application for individual users or types of analysis. Each user profile comprises a combination of settings that become active when that

profile is used, including a set of scripts that can be run directly from the toolbar. You can define as many user profiles as you wish (see page 50), then display a toolbar that's specific to the profile you want. The profile name displays to the right on the toolbar; *standard.prf* in this example.

In addition to the toolbars themselves, 622Vu Advisor provides bubble Help that describes each toolbar button.

Displaying Toolbars & Toolbar Help

You can toggle use of the toolbars and toolbar Help via the **View** menu. Use the first two commands in that menu to toggle display of the system and profile toolbars, respectively. The last option, **Enable Toolbar Help**, toggles the system toolbar's Help feature on and off. With this feature enabled, 622Vu Advisor's bubble Help describes each toolbar button as you point to it:



The Active Cell Library

All 622Vu Advisor processing requires that you have an active cell library. Any changes you make during processing are saved in the active cell library immediately. Before proceeding, make sure the cell library you want to update is open. Refer to *Section* 3.3 Managing Cell Libraries (page 47) for related instructions.

Taskbar Icons

While 622Vu Advisor runs, you'll see this icon in your taskbar:  .

This icon represents the CellCommand32 OLE Automation Server application being used by 622Vu Advisor. Do not shut this application down explicitly; 622Vu Advisor will close it when it's no longer needed.

Obtaining Help

If you need Help with any of 622Vu Advisor's windows, either press <**F1**>, click the **Help** button on the window you're processing, or use the **Help** menu to choose any of several Help-related commands.

Exiting 622Vu

When you're through running 622Vu Advisor, click the **Exit Application** button (or choose **Exit** from the **File** menu).

3.1 Summary of Menu Commands

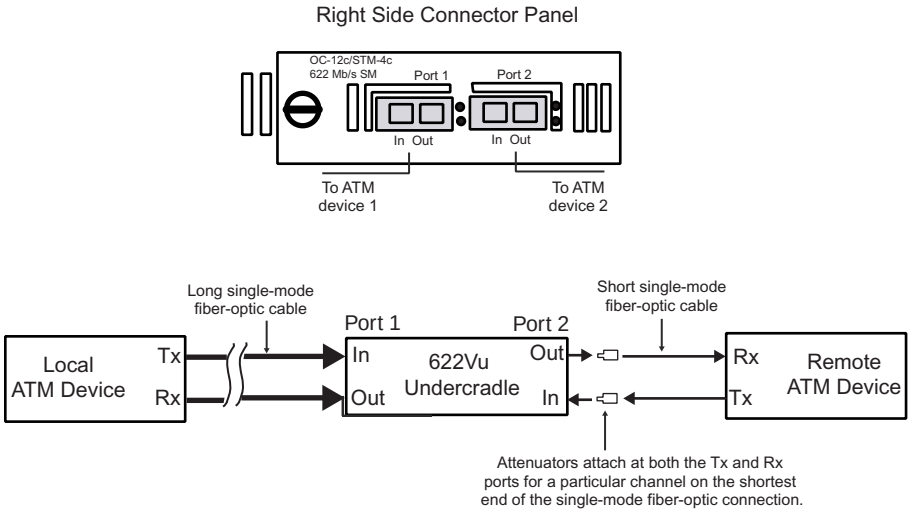
Menu Command	Toolbar Equivalent	Used to…
File		
New Library		Create a new cell library.
Open Library		Open a cell library.
Edit User Profile	 *profile toolbar*	Edit a user profile to change one or more specifications, then either save the changes for the same profile, or save the changes under a new name.
Load User Profile	 *profile toolbar*	Load a user profile, configuring 622Vu Advisor according to that profile's settings.
Exit		Exit 622Vu Advisor.
View		
System Toolbar	—	Toggle display of the system toolbar.
Profile Toolbar	—	Toggle display of the profile toolbar.
Enable Toolbar Help	—	Toggle use of bubble Help for the system toolbar buttons.
Activities		
Manage Devices		Launch the Device Manager, which is used to configure analysis devices and to monitor the physical interface between a device and an ATM device (e.g., after executing a script, or simply to get a general sense of the traffic and physical medium). Also used to generate errors in the physical transmission layer.
Real-Time Statistics		Launch the Real-Time Statistics application, which lets you monitor active network connections on the link attached to a device, and provides related statistics in both tabular and graphic format.
Capture		Launch the Capture utility, which is used to initiate and monitor cell captures, and/or to review and manipulate captures that were run previously.
Capture Filters		Specify filtering criteria for use when capturing cells.
Transmit Scripts		Browse and execute (then optionally monitor) scripts.
Edit Transmit Sequences		Define or edit a transmit sequence, including individual cells in that sequence.

Menu Command	Toolbar Equivalent	Used to…
QoSMeter		Launch the QoSMeter utility, which is used to test the quality of service over a particular VCC.
Ping Generation		Launch the Ping Generation tool, which sends standard *ping* messages through an ATM network, targeting a specific destination address.
Tools		
Cell Sequence AAL Wizards (AAL5)	—	Define AAL5 PDUs easily, adding them to an existing or new sequence. The system prompts for all the information necessary to generate the PDU, and computes the end-of-datagram automatically.
Window		
Minimize All Windows	—	Minimize all 622Vu Advisor windows.
Restore All Windows	—	Restore any 622Vu Advisor windows that were minimized previously.
title of each open window	—	Make the window you choose active.
Help		
Contents	—	Display the Help Contents.
How to Use Help	—	Display the standard Windows Help window, including tabs for Contents, Index, and Find.
Obtaining Technical Support	—	Display instructions to contact technical support, information about the software versions you're running, and the specifics of your installed devices.
About 622Vu Advisor		Display general information about 622Vu Advisor, including version, licensing information, available system resources, etc.

3.2 Connecting to the ATM Network

When you are ready to connect your 622Vu undercradle to your ATM network use the following steps:

1. Insert the 622Vu undercradle between two ATM devices by attaching ATM cables (not supplied) from the two devices to Ports 1 and 2 on the 622Vu undercradle's right-side connector panel.



2. **If you are using a single-mode fiber-optic interface** and connecting the 622Vu undercradle on a relatively short run of the cable (one mile or less), you must use 10-db inline attenuators to protect both the ATM device and the 622Vu undercradle from the power of the laser. For the channel that is running out over the shortest length cable in this case, attach an attenuator to both the Transmitting (Out) and Receiving (In) ports on the 622Vu undercradle.

3.3 Managing Cell Libraries

Remember from Chapter 2 that 622Vu Advisor stores its information in a central repository known as a *cell library*. You can have any number of cell libraries, but each library is a complete entity, containing all the sequence definitions, script definitions, filterset definitions, QoSMeter test sessions, etc., that are used together during processing.

622Vu Advisor provides commands to open and create cell libraries, as detailed below.

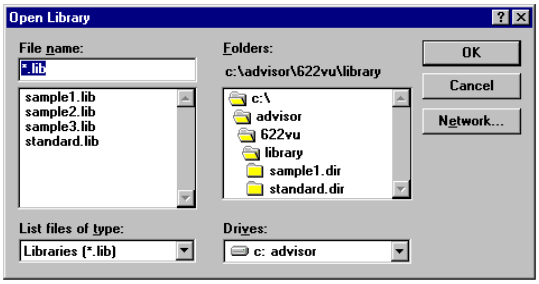
Note: For processing efficiency, 622Vu Advisor only stores two types of information outside of the cell library: configuration information and cell-capture files. The configuration information includes a standard initialization file, config.ini, and user profiles that are stored using a standard Windows format. The capture files are stored as binary files, to allow for quick access, transport on floppy disk, and transmission over a network.

Opening a Cell Library

You can only have one cell library open at a time, and all actions apply for that library until you close it. When you start 622Vu Advisor for the first time, it opens with a standard library called *standard.lib*. You can use this library or any of the other libraries shipped with 622Vu Advisor (detailed in Appendix **C**); or you can define one or more different libraries for use at your site.


Open Library

To open a library, click the toolbar's **Open Library** button (or choose **Open Library** from the **File** menu). This opens a standard file-open dialog box that you'll use to navigate to the library you want (shown to the right).



As necessary, refer to your Windows documentation for instructions to use this dialog box.

Note: When you open a cell library, 622Vu Advisor automatically closes the old library for you.

If you always work with a particular library, make sure to specify that library in your user profile (see *Editing a User Profile* on page 50).

Creating a New Cell Library


New Library

Each cell library is fully self-contained, and many users store all their definitions in a single library; however, the system lets you maintain multiple discrete libraries, as necessary. Click the toolbar's **New Library** button to define a new cell library (or choose **New Library** from the **File** menu).

622Vu Advisor opens a dialog box that prompts for the name of the new library (similar to the one shown above for open-library processing). Specify the filename you want, using the format *name*.lib. If you omit the suffix, 622Vu Advisor assigns it correctly. Cell libraries can be stored anywhere, but typically reside in 622Vu Advisor's \library directory.

Saving Library Changes

Any changes you make during a 622Vu Advisor session apply for the active (i.e., open) cell library, and are saved immediately when you click the **Apply** or **OK** button from a processing window.

3.4 Setting Up User Profiles

622Vu Advisor lets you set up one or more user profiles, each comprising:

- A combination of settings that become effective when that profile is loaded: a particular cell library, use of toolbars and toolbar Help, and so forth.
- Up to 16 scripts that are run regularly by the profile user(s). The scripts associated with a particular profile are available to all users throughout the system, and are simply associated with the profile to facilitate their execution. Each script has a corresponding run button on the profile's toolbar, allowing you to run it with a click of the mouse. Any one script can be associated with several profile toolbars.
- Preferences (and other information) that's stored session to session, so you can restart with the same settings.

Profiles provide an easy way to establish a particular configuration quickly, but don't restrict you to the profile-specific settings; you can change any settings you want, regardless of the profile in use.

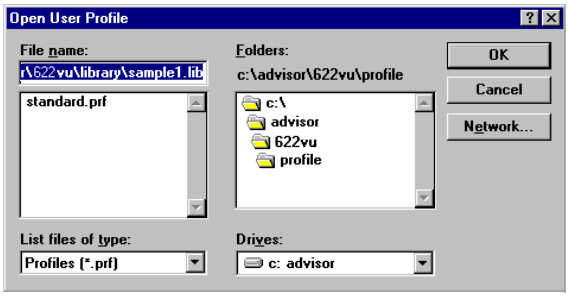
622Vu Advisor is distributed with one standard profile, called *standard.prf*. This profile is active when you first start 622Vu Advisor; thereafter, the application starts with the last profile used.

Loading a User Profile

You can change the active user profile at any time, as necessary to adjust the default settings or to bring up a different set of commonly executed scripts.


Load
User Profile

To do this, click the profile toolbar's **Load User Profile** button (or choose the corresponding command from the **File** menu). This brings up a standard file-open dialog box:



Use this dialog box to navigate to the profile you want, then click **OK**. Profile files use the suffix .prf. They can be stored anywhere, but typically reside in the 622Vu Advisor's \profile directory.

After you select a profile and click **OK**, 622Vu Advisor loads the requested profile and configures itself to be consistent with that profile (to show toolbars or not, for example).

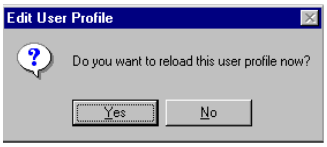
Editing a User Profile


Edit
User Profile

You can edit a user profile to change it, or to define a new profile that you'll save under a different name. To initiate the edit, first make sure the profile you want to change is active. (If it's not, load it as described above.) Then click the **Edit User Profile** button on the profile toolbar (or choose the corresponding command from the **File** menu).

622Vu Advisor opens a window you can use to modify the profile. Tab to each category of setting, in turn, making changes as necessary. When you're through:

- Click **OK** to save the new definition. 622Vu Advisor asks if you want to reload the revised profile (right). Click **Yes** to reload; **No** to continue with the previous settings. In either case, 622Vu Advisor saves the profile.

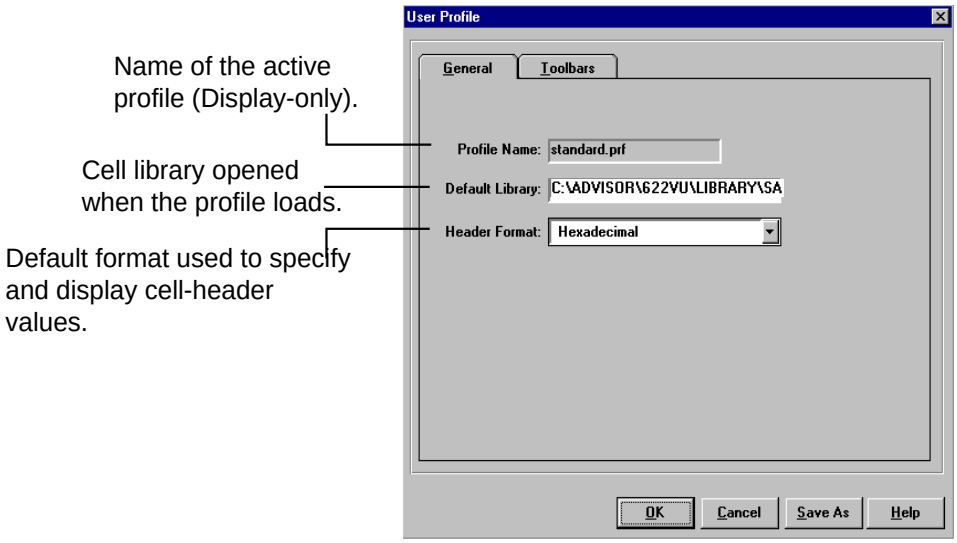


- Click **Save As** to save the changes under a new name then load the new profile. Use the standard Save dialog box to assign a name to the profile, using the format *name*.prf. If you omit the suffix, 622Vu Advisor assigns it correctly. Profiles can be stored anywhere, but typically reside in 622Vu Advisor's \profile directory.

Note: In addition to the settings described here, you can establish user-profile settings for use during capture processing. These are edited differently, as described with the capture facility (Chapter 6).

General Settings

Use the General tab to identify the default cell library for the profile, and the default format in which to view (and enter) cell-header information:

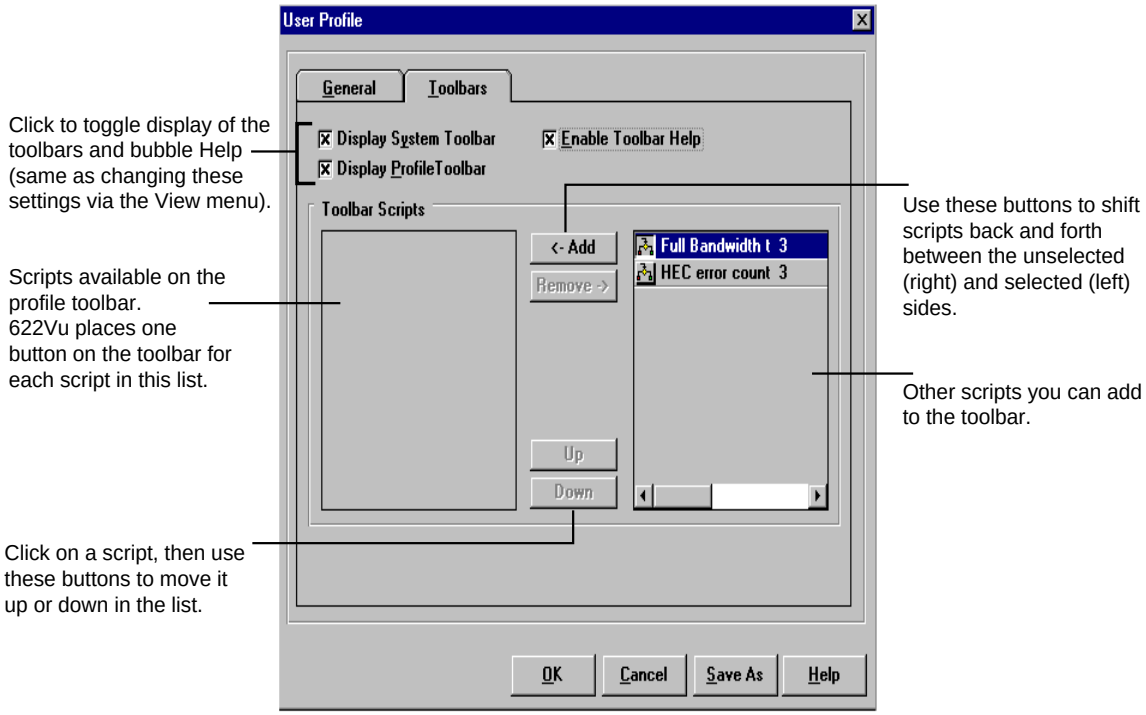


- Specify the **Default Library** as the name of the library to open when the profile is loaded.
- Specify the **Header Format** as either Hexadecimal or Decimal, indicating the default format to use when displaying or entering the cell header (VPI/VCI, PTI, etc.). As necessary, you can override this setting on each window used to specify cell-header information.

Toolbar Settings

Use the Toolbars tab to enable or disable the display of the two toolbars, as well as the associated bubble Help. If you enable the profile toolbar, you can identify

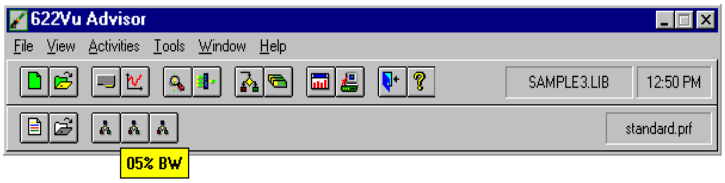
up to 16 scripts that will run directly from that toolbar, using the Toolbar Scripts panel (bottom of window):



- Mark **Display System Toolbar** to display the system toolbar.
- Mark **Display Profile Toolbar** to display the profile toolbar.
- Mark **Enable Toolbar Help** to display the system toolbar's bubble Help.
- Use the Toolbar Scripts area to identify those scripts you want to execute directly from the profile toolbar. The righthand side of the Toolbar Scripts area lists each script defined in the Default Library associated with this profile (via the General tab), but not yet assigned to the toolbar. To associate a script with the profile (and add it to the profile toolbar), select it in this righthand box, then use the **Add** button to shift it to the left (i.e., selected) box. If a script is selected (highlighted) in the lefthand list when you do this, 622Vu Advisor places the new script just after the highlighted one; otherwise, it places the new script at the end of the list. As necessary, use the **Remove** button to shift a script back to the unselected area.

When a user profile loads, 622Vu Advisor assigns buttons across the toolbar in the same order as the scripts are listed in the lefthand box: the first script is the

left-most button on the profile toolbar, the second script is the next button, and so forth. The bubble Help identifies the script associated with each button:



If the order of the scripts is important to you, use the **Up** and **Down** buttons to position the script names correctly in the selected list. (Select a script then click the appropriate button to move it.)

A word of caution: If you change the profile's cell library *after* assigning scripts, then load the profile, the script buttons on the profile toolbar correspond to scripts in the new library, and not in the library from which you originally assigned them. If the new library doesn't have a script to match a particular name, the profile ignores that script entry.

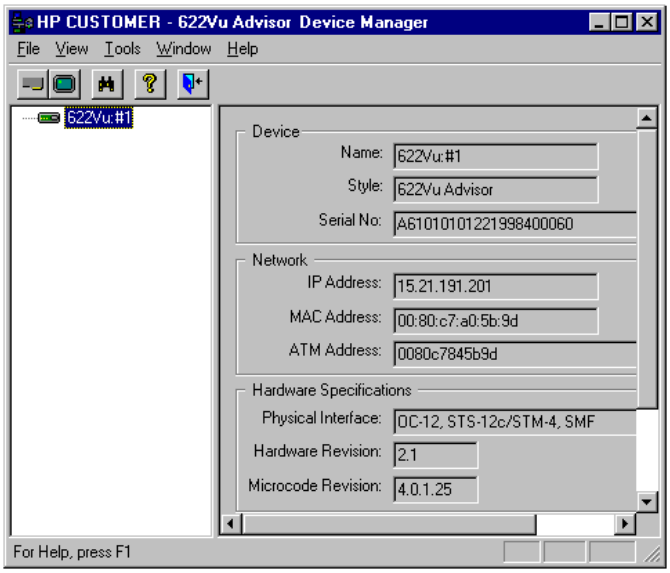
Chapter 4
Configuring Analysis Devices

622Vu Advisor's Device Manager lets you configure analysis devices, and/or monitor the physical interface between an analysis device and the ATM device under test. This chapter describes how to configure analysis devices. Refer to Chapter **5** for instructions to monitor the physical interface.

Starting the Device Manager


Manage Devices

Click the **Manage Devices** button to initiate the Device Manager. 622Vu Advisor builds a device list, then displays the Device Manager window:



Lefthand Side of the Initial Display

The lefthand side of this window has one line for the analysis device that you can access.


Refresh

You'll only see the devices that are available for use currently. If the specific device is already performing RAM-intensive activity (such as a capture), it won't appear in the list. If you expect to see a device that isn't here, click the **Refresh** button to reevaluate its status.

Righthand Side of the Initial Display

The righthand side of the window shows information that corresponds to the device selected (left side). This information is retrieved from the hardware and cannot be changed. It includes device, network, hardware, and resource information, as described below:

Panel	Field	Description
Device	Name	System name to identify each device, followed by a number (always 1).
	Style	Type of device (always 622Vu Advisor).
	Serial No	Analysis device's identifying serial number.
Network	IP Address	Internet Protocol address to identify the analysis device.
	MAC Address	Media/Medium Access Control address to identify the analysis device.
	ATM Address	ATM address to identify the analysis device.
Hardware Specifications	Physical Interface	Type of connection supported between the analysis device and ATM device, followed by the type of media used to connect to the ATM device:
		OC-12c/STM-4c (SMF)
	Hardware Revision	Hardware revision.
	Microcode Revision	Revision of the device's microcode.
Resources	Memory Bank 1	If the analysis device is configured as an end station, this is the amount of RAM available for capturing traffic.
		If the analysis device is configured as a monitor-only station, this is the amount of RAM available for monitoring/retransmitting traffic over Channel 1.
	Memory Bank 2	If the analysis device is configured as an end station, this is the amount of RAM available for cell transmission (i.e., executing a script).

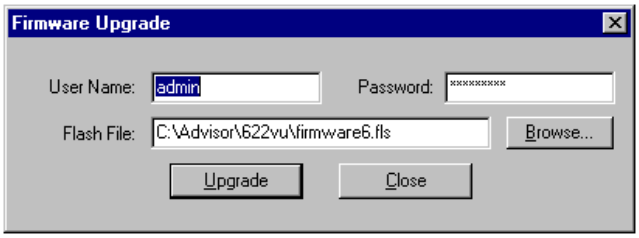
Panel	Field	Description
		If the analysis device is configured as a monitor-only station, this is the amount of RAM available for monitoring/retransmitting traffic over Channel 2.

Menu and Toolbar Commands

Use the Device Manager menu and toolbar commands as described in Table 1 (page 57).

Upgrading Firmware

Note: This operation is only necessary if the undercradle has lost its programming. It should not be necessary to do this operation regularly.



To upgrade the firmware on a 622Vu Advisor, choose **Update Firmware** from the **Tools** menu.

Using the dialog returned, enter your user name and password (initially *admin* and *adminpass*, respectively), then navigate to the upgrade file you want to use. Click **Browse** and then locate `c:\advisor\622Vu\firmware6.fls`. Click **Upgrade** when you are through.

622Vu Advisor displays a progress bar during the upgrade, then asks you to reboot the device (necessary after an upgrade, before you can access the device):

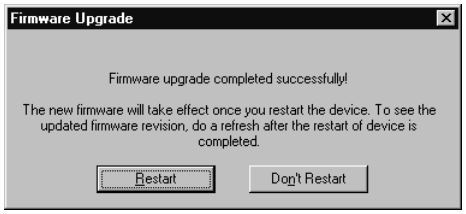


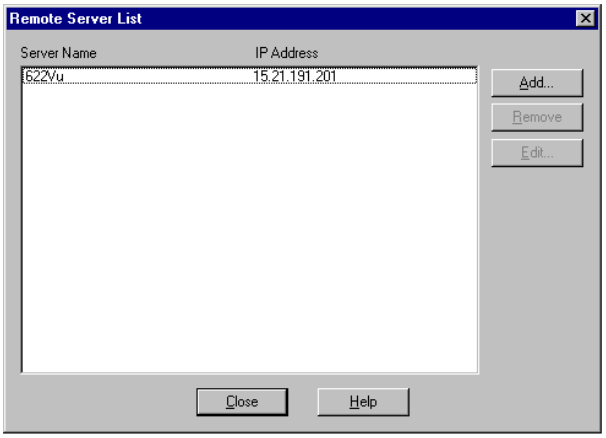
Table 1. Device Manager Menu Commands and Toolbar Buttons

Menu Command	Toolbar Equivalent	Used to…
File Exit		Close the Device Manager.

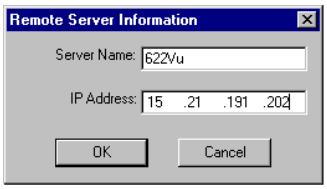
Menu Command	Toolbar Equivalent	Used to…
View		
Toolbar	—	Toggle display of the toolbar.
Status Bar	—	Toggle display of the status bar (bottom of window).
Refresh		Reevaluate the status of each device and rebuild the list of available devices.
Tools		
Configure Device		Configure the selected device. The specifics of this window vary depending on the physical interface supported (OC-12c/STM-4c), and the current configuration of the analysis device. Details follow in this chapter.
Monitor Physical Interface		Monitor the ATM network via the selected device. Refer to Chapter **5** for information about this feature.
Update Firmware	—	Upgrade the device to a new version of firmware. Refer to page 57 for information about this feature.
Configure Server List	—	Define which analysis devices are available to your system. Refer to page 59 for details about this feature.
Reboot Device	—	Reboot the selected device. 622Vu Advisor verifies your request before rebooting the hardware.
Window		
Close All	—	Close all Device Manager windows.
Windows...	—	Make a window active or close a window.
Help		
Help Topics	—	Display standard Windows Help for the Device Manager.
About Device Manager...	—	Display general information about the Device Manager.

Configuring the Server List

The Device Manager lets you configure the list of analysis devices available to you, without having to go into the config.ini file directly. (The device list is maintained in config.ini.) To do this, choose **Configure Server List** from the **Tools** menu. 622Vu Advisor opens a list of devices currently configured for your use:



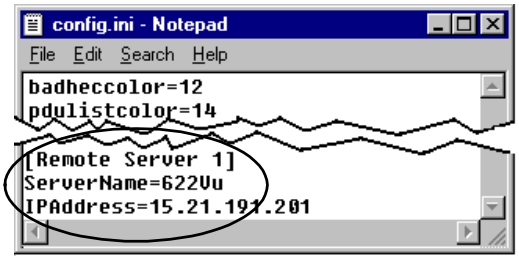
- Click **Add** to add a device to the list, making it available for use by your system. 622Vu Advisor opens a dialog box (right) that lets you specify the server name and IP address of the device:



  Specify the **Server Name** as the system name associated with the analysis device.

  Specify the **IP Address** as the Internet address assigned to the analysis device, using dotted notation.

  Click **OK** when you're through. 622Vu Advisor updates the config.ini file to add the device (shown right). Use the **Refresh** button to reflect the new device in the display.



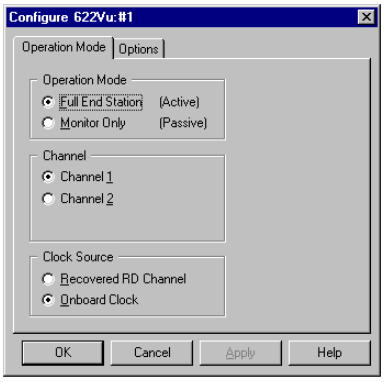
- To change a device name or IP address, first select the device from the list, then click **Edit**. 622Vu Advisor prompts for the changes using a window similar to the one described above for an add.
- As necessary, select an address then click **Remove** to delete it from the device and server lists.

Selecting a Device to Configure


Configure Device

To view or define the configuration information for an analysis device, first select the analysis device you want in the lefthand side of the window. Then either click the **Configure Device** button (shown left) or choose the corresponding command from the **Tools** menu.

622Vu Advisor opens a window used to configure the selected analysis device.



Grayed options, if shown, are not configurable with the version of the hardware you're using.

Proceed as follows from the configuration window:

1. Use the **Operation Mode** tab to identify the mode of operation under which the device should function, and related settings.
2. Use the **Options** tab to establish settings that are specific to the physical interface installed, and common to both channels. If there is no Options tab, there are no settings that apply across channels.
3. Use the **Channel 1** and **Channel 2** tabs to set channel-specific options. If there are no Channel tabs, there are no settings that are specific by channel.

Click **Apply** as necessary, to save the settings on the active property sheet (i.e., tab). Click **OK** to save the settings on all the configuration tabs.

The next section describes the Operation Mode configuration for the OC-12C/STM-4C interface.

When you're through configuring the device(s), choose the **Exit** command from the **File** menu.

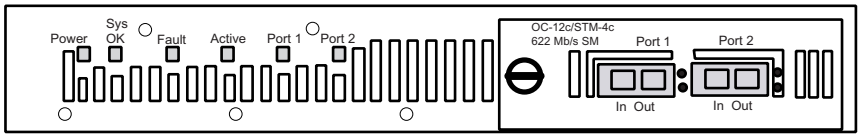
4.1 Configuring the Operation Mode

At any point in time, each analysis device can run as *either* an end station or a monitor-only station:

- An **end station** is known across the network, and can send and receive data. In this mode, 622Vu Advisor lets you monitor traffic coming in on either of the analysis device's two channels; you select the channel you want.
- A **monitor-only station** examines network traffic passively, without being recognized across the network. In this mode, 622Vu Advisor automatically monitors the traffic coming in both channels, and retransmits traffic over the opposite channel from where it's received. (Incoming on Channel 1 goes out over Channel 2; incoming on Channel 2 goes out over Channel 1.)

  Note: There's no loss of signal strength if you elect to monitor traffic; the analysis device recovers the data stream, removes any jitter, then retransmits the signal.

The right-most LEDs on the 622Vu undercradle indicate the current operation mode:



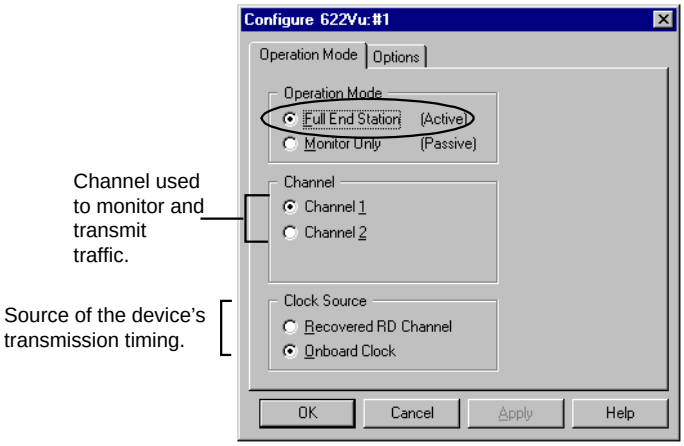
Device is operating in end-station mode when the top indicator is lit, and in monitor-only mode when the bottom indicator is lit.

Figure 2. LEDs Indicating Current Operation Mode

Use the Operation Mode tab to establish the settings you want.

Setting Up an End Station

With an end station analysis device, you can monitor traffic coming in on either (one) of the analysis device's two channels. All outgoing traffic is transmitted over that same (receive) channel. When setting up an analysis device to run as an end station, the configuration window includes a **Channel** selection and (as appropriate to the interface type in use) a **Clock Source** area:



- The **Channel** area identifies the channel over which you want to monitor network traffic, and from which you want to transmit traffic from the device. Each analysis device has two channels, and you can use either one (1 or 2).
- The **Clock Source** indicates where the analysis device should obtain its transmission timing (pulse frequency), which is used to synchronize outgoing transmissions. Select the source you want:

Clock Source	Use if the device…
Recovered RD Channel	Recovers the clocking signal from the receive-data (RD) channel, thereby synchronizing transmissions with incoming traffic.
Onboard Clock	Uses the clock on the analysis device.

Possible End-Station Configurations

You can establish either of two configurations when running as an end station, as detailed in Table 2. In that table, the Configuration # (5 or 6) indicates the number used internally by 622Vu Advisor to identify the particular configuration setting. This number shows up on the window used to monitor the ATM network (described in Chapter **5**).

Use this key to interpret the symbols used in the Traffic Flow diagrams:

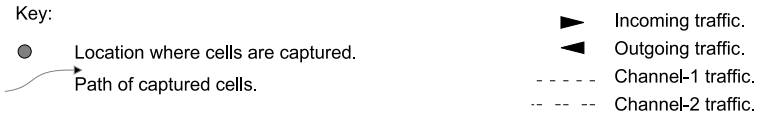
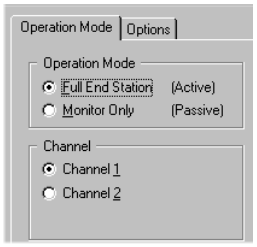
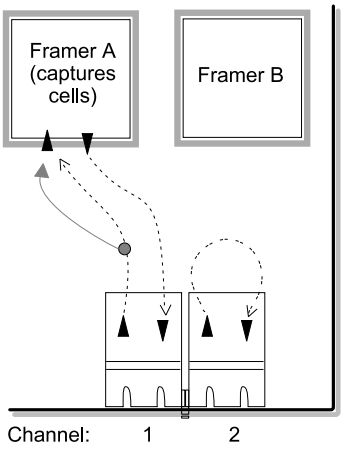
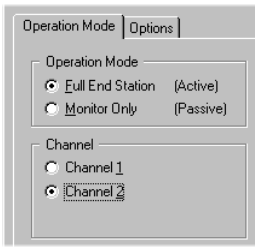
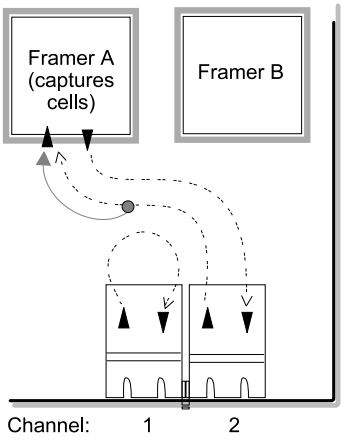
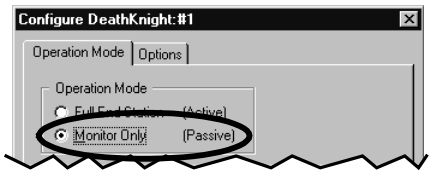


Table 2. Possible Configurations for an End Station

Definition	Traffic Flow	Description
Configuration # 5: 		Incoming traffic on Channel 1 goes into the framer chip on the analysis device and is monitored by 622Vu Advisor (and optionally captured). The analysis device transmits traffic over Channel 1. Incoming traffic on Channel 2 loops out over Channel 2 without being monitored.
Configuration # 6: 		Incoming traffic on Channel 1 loops out over Channel 1 without being monitored. Incoming traffic on Channel 2 goes into the framer chip on the analysis device and is monitored by 622Vu Advisor (and optionally captured). The analysis device transmits traffic over Channel 2.

Setting up a Monitor-Only Station

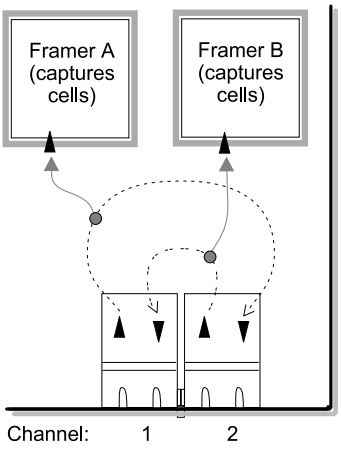
With a monitor-only mode analysis device, 622Vu Advisor automatically monitors the traffic coming in both channels, and retransmits all traffic over the opposite channel from where it's received. When configuring a monitor-only device, then, you need only specify the Operation Mode (shown to the right and described on page 61).

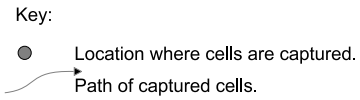


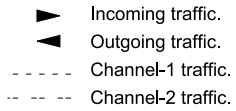
The traffic flow is always the same, and allows you to connect with two physical ATM links:

- Incoming traffic on Channel 1 is monitored by 622Vu Advisor (and optionally captured), then goes out over Channel 2.
- Incoming traffic on Channel 2 is monitored by 622Vu Advisor (and optionally captured), then goes out over Channel 1.

Use the following key to interpret the symbols used in the illustration:



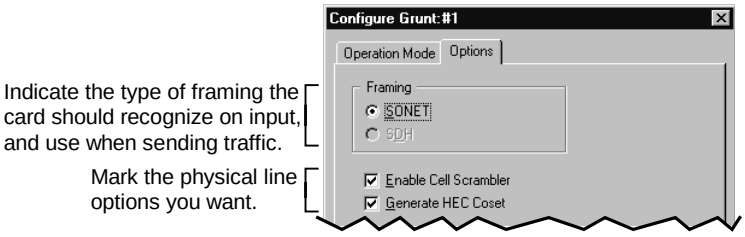




The internal Configuration # is always 10 for monitor-mode devices, and is used by 622Vu Advisor to identify this particular configuration. The configuration number shows up on the window used to monitor the ATM network (Chapter **5**).

4.2 Configuring an OC-12c/STM-4c Device

Configuration of an OC-12c/STM-4c device involves setting options specific to the physical interface. The Options tab looks like this:



Specify the options as follows:

Option	Description
Framing	Method used to synchronize cell transmissions: SONET or its European equivalent, SDH (Synchronous Digital Hierarchy). Both transmit at 622 Mb/s. The SONET C2 overhead octet is hex 13 on transmit, and the SDH C2 overhead octet is hex 13. On the receive side, the analysis device checks for hex 13. For capture processing, make sure to use a setting that's compatible with the sending device (or the result will be no data).
Enable Cell Scrambler	Indication of whether to scramble the payload data at transmission, and unscramble payload data when received. Mark the check box to enable this scramble/unscramble feature. For capture processing, make sure to use a setting that's compatible with the sending device. Most network devices enable scrambling.
Generate HEC Coset	Indication of whether to enable the $x^6+x^4+x^2+1$ polynomial to be XORed with the calculated HEC. Mark the check box to enable this feature. For capture processing, make sure to use a setting that's compatible with the sending device.

As necessary, refer to page 60 for instructions related to the Operations Mode tab.

Chapter 5
Monitoring the ATM Network

622Vu Advisor's Device Manager lets you monitor the physical interface between any analysis device and the ATM device being tested, as analysis proceeds. This is useful after executing a script (see page 171), to track the transmission online. It's also useful to get a general sense of how clean the traffic and physical medium are.

This chapter describes how to monitor the physical interface. The Device Manager is also used to configure analysis devices, as described in Chapter **4**.

Starting the Device Manager


Manage Devices

Click the **Manage Devices** button on the toolbar to initiate the Device Manager. 622Vu Advisor builds a device list, then displays the Device Manager window. Refer to page 55 for a description of this window and the information shown, and for a description of each menu command available during processing.

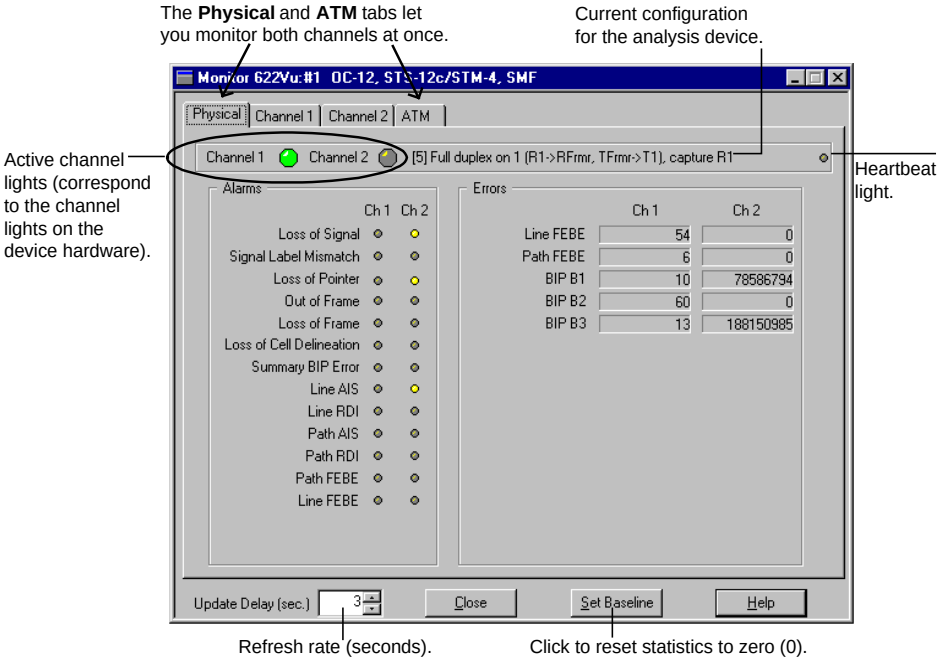
Selecting An Analysis Device


Monitor Physical Interface

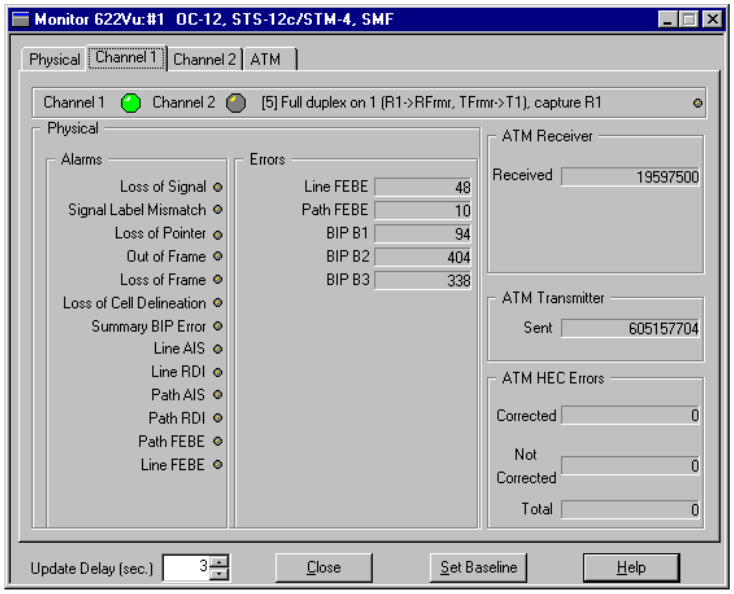
To begin monitoring the physical interface between a particular analysis device and the ATM device being tested, first select the analysis device you want in the lefthand side of the window. Then either click the **Monitor Physical Interface** button (shown left) or choose the corresponding command from the **Tools** menu.

Overview of the Display

622Vu Advisor opens a window that's specific to the physical interface supported by the device. The top of the window and overall format is illustrated below :



- The **Physical** tab (above) displays physical characteristics of data transmissions for both channels at once. This is the same information as is shown on the Channel tabs, but combines the two channels in one display.
- The two **Channel** tabs let you monitor one channel at a time:



Click on the tab for the channel you want to monitor (1 or 2). The left side of the display shows alarms and errors relating to the physical characteristics of the data transmission (as observed by the device). The right side shows ATM statistics: counts of various receiver/transmitter conditions, as well as instances of a bad HEC. These (ATM) statistics are the same across interface types.

The **ATM** tab (shown on page 72) displays the ATM statistics for both channels at once. This is the same information as is shown on the Channel tab, but combines the two channels in one display. The ATM tab also graphs the percent of available bandwidth used to transmit data (vs. idle cells), separately by channel. The bandwidth-usage statistics are sampled (and reported) every five seconds.

Regardless of the tab you're viewing, the information at the top of the window and bottom is the same, as described starting on page 69.

You can move freely among the tabs to monitor the physical interface. The **Set Baseline** button (bottom) resets the statistics and counters across all tabs, so your information stays in sync.

Note: **Set Baseline** applies only to your Device Manager's view of the statistics, and does *not* reset counters on the hardware device. This means that if another user is accessing the same board, that user's statistics are unaffected.

When you're through, click the **Close** button. Then, from the Device Manager window, choose **Exit** from the **File** menu.

General Indicators: Top

The LEDs tell you which channels are active and the device's overall configuration, and provides a heartbeat light:

- Active channels are indicated by the LEDs in the top left. The indicator corresponding to each channel lights, as appropriate, to reflect: 1) a good physical connection; and 2) that the channel is being reported by the ATM 622Vu Advisor.

  The indicators here correspond to the LEDs between the channel connectors on the 622Vu undercradle hardware:

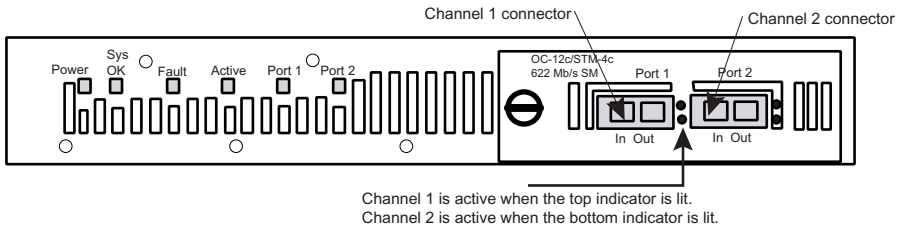


Figure 3. Channel Indicators for a 622Vu Advisor

One or both of the channels are highlighted, indicating the channel(s) configured to receive (and capture) network traffic (see Chapter **4**, ***Configuring Analysis Devices***):

⇒ For devices configured as an end station, only one channel is highlighted, corresponding to the channel you selected when configuring the analysis device.

⇒ For devices configured as monitor-only stations, both channels are always highlighted.

- The device's configuration takes this form:

  [*config_id*] *op_mode* (*receive/xmit_channels*) capture *capture_channel*

  It reflects the configuration established through the software (see Chapter **4**), and contains specific information as follows:

Item	Description
config_id	Always 10 for a monitor-only device; 5–8 for an end-station device, indicating which of the possible configurations is set (see **Table 2** on page 63).
op_mode	Operating mode set for the analysis device:
	Mode / **Description**
	Full duplex on *n* / End station listening on Channel *n.*
	Pass-thru / Passive (monitor-only). All traffic comes in one channel and goes out the other.
receive/xmit_channels	Traffic flow through the analysis device, formatted as two sets of *receive -> transmit* specifications separated by a comma. For example: R2->T2, R1->T1
	Each side of the specification is described as either:
	R (receive) or T (transmit), followed by the channel number (1 or 2). This applies for traffic flowing through Channels 1 or 2.

Item	Description
	RFrmr (receive framer) or TFrmr (transmit framer). This applies to traffic flowing through the on-device framer chip. If the flow goes out over two channels, the right side of the specification has two values: TFrmr->T2+T1.
capture_channel	Channel on which 622Vu Advisor is listening to the device's traffic, specified using the same notation as above (e.g., "capture R1"). Always "R1 and R2" for dual-capture, monitor-only devices.

In this example: **[5]Full duplex on 1(R1->RFrmr, TFrmr->T1), capture R1,** we're looking at a device that's running as an end station listening on Channel 1. Traffic coming in on Channel 1 is going to the receive framer, and traffic from the framer chip is going out through Channel 1. 622Vu Advisor is capturing traffic off Channel 1. Internally, this is known as Configuration #5.

- The heartbeat light (far right) flashes to indicate communication between the analysis device and ATM device under test.

General Indicators: Bottom

The bottom line lets you control the frequency with which information is updated (**Update Delay** field), and has buttons used to:

- **Close** the window.
- **Set Baseline** counters to zero. A reset initializes error counters as well as ATM counters and graphs.
- Request **Help** text describing the information shown.

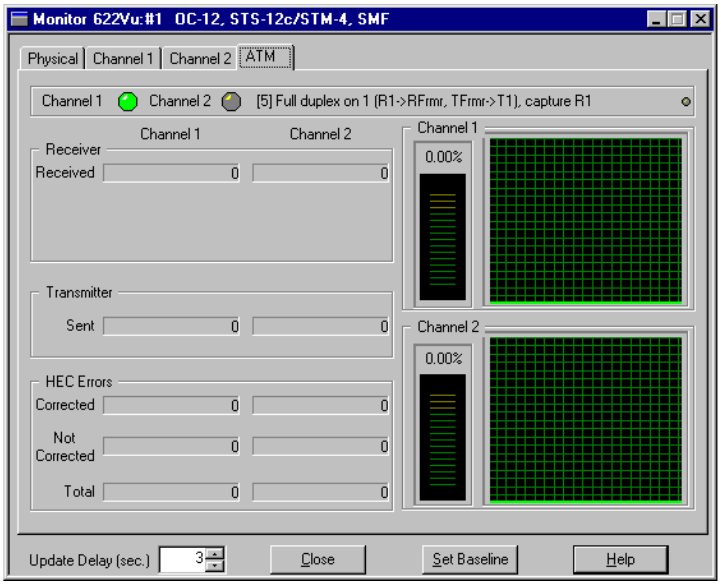
The **Update Delay** controls how often 622Vu Advisor refreshes the information displayed. Specify this field as a number of seconds (in the range 1–3600), or use the spin-control arrows to increase or decrease the value shown. 622Vu Advisor will begin refreshing the information at the requested frequency.

Where to Go From Here

The next section describes the ATM tab, which is identical across all the physical interfaces supported by the analysis devices. Subsequent sections describe the errors and counters shown for each specific physical interfaces and, as appropriate, the BIP error-generation features available for that interface.

5.1 The ATM Tab

The ATM tab shows the following information for OC-12c/STM-4c physical-interface type.



The indicators to the left count various receiver/transmitter conditions, as well as instances of a bad HEC:

- **Receiver** counters indicate how many times non-idle ATM cells occur.
- **Transmitter** counter increments by 1 for each cell that's actively sent out by the device (applicable in end-station mode when the device is actively transmitting cells over the channel it's monitoring).
- **HEC Errors** counters track these conditions related to HEC errors in incoming traffic:

Counter	Increments by 1 when:
Corrected	A HEC error is corrected by the framer chip (which automatically corrects single-bit errors).
Not Corrected	A HEC error can't be corrected by the framer.
Total	Both of the above.

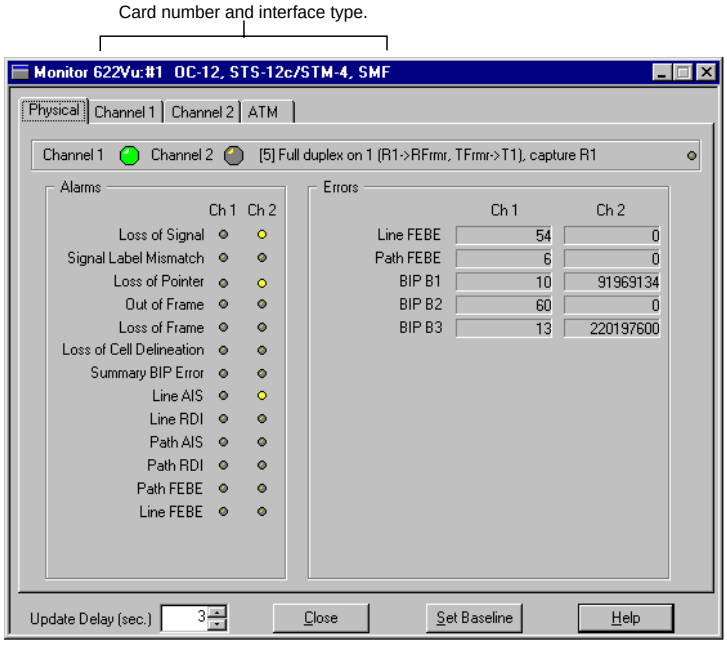
The graph to the right shows the percent of available bandwidth used to transmit data (vs. idle cells), separately by channel. The bandwidth-usage statistics are sampled (and reported) in accordance with the frequency specified via the **Update Delay** field (see page 71).

5.2 Monitoring an OC-12c/STM-4c Interface

This section describes the physical indicators for an analysis device configured to support OC-12c/STM-4c. You can obtain a different view of this same information through the Channel tab, described on page 68. The ATM tab is described on page 72.

Physical Tab

The Physical tab looks like this for an OC-12c/STM-4c interface:



The sections below describe the alarms and errors specific to OC-12c/STM-4c.

Alarms

The first two **alarms** indicate major problems, and should remain clear when running with a good connection. The other alarms may light during processing, and indicate various physical events:

Alarm	Lights when this event occurs:
Loss of Signal	Total loss of signal; most likely a cabling problem (lost connection, damaged cable, etc.).
Signal Label Mismatch	The analysis device can't figure out the incoming signal; specifically, the received value in the C2 octet doesn't equal hex 13 for seven consecutive frames. The most likely problem is a device that's connected to an ATM device through the wrong type of physical connection (e.g., an OC-12c/STM-4c device cabled to an OC-3 device).
Loss Of Pointer	Loss of Pointer error; i.e., there's no valid H1/H2 pointer in the STS-12c/STM-4c frame.
Out Of Frame	Out of Frame error; i.e., the analysis device observes four consecutive in-error A1/A2 framing patterns. The pattern observed consists of the third A1 octet and the first A2 octet.
Loss Of Frame	Loss of Frame error; i.e., the STS-OOF is active for 24 consecutive STS-12c/STM-4c frames.
Loss Of Cell Delineation	Loss of Cell Delineation error (indicating a loss of cell synchronization). Lights when seven consecutive HEC errors occur at the current cell-delineation position.
Summary BIP Error	Bit-Interleaved Parity check error; i.e., an error in the B1, B2, or B3 BIP-8 or BIP-24 codes at the receiver.
Line AIS	Alarm Indication Signal on the line (signal is sent downstream to report an error detected upstream). Lights after the three least significant bits of the K2 octet are '111' for five consecutive frames. (MS-AIS = equivalent SDH term)
Line RDI	RDI (Remote Defect Indicator) error on the line (signal is sent upstream to report a receive or transmission error downstream — generally a frame-sync error or a loss of incoming signal). Lights when the three least significant bits of the K2 octet are '110' for five consecutive frames. (MS-RDI = equivalent SDH term)
Path AIS	Alarm Indication Signal on the path; i.e., the H1 and H2 octets are all ones for three consecutive frames. (AIS = equivalent SDH term)
Path RDI	RDI (Remote Defect Indicator) error on the path, indicating a loss of cell delineation. Lights when the analysis device detects a value of 9 in the most significant nibble of the G1 octet of the STS-12c/STM-4c overhead. (RDI = equivalent SDH term)
Path FEBE	Far End Block Error on the path, indicating that the block (frame) has a checksum error. Lights when there's a non-zero FEBE value (1–8) in the most significant nibble of the G1 octet of the STS-12c/STM-4c overhead. (SDH REI = equivalent SDH term)

Alarm	Lights when this event occurs:
Line FEBE	Far End Block Error on the line, indicating a valid non-zero FEBE value (1–24) in the Z2 octet of the STS-12c/STM-4c overhead. (MS-REI = equivalent SDH term)

Errors

The **Errors** counters indicate the number of occurrences of various events, including alarms and other errors. Each counter has a corresponding alarm LED that lights when the event occurs (B1–B3 all show up in the Alarms panel as Summary BIP errors).

Counter	Increments by 1 when this event occurs:
Line FEBE	Far End Block Error on the line. Increments if any valid non-zero FEBE value (1–24) is detected in the Z2 octet of the STS-12c/STM-4c overhead.
Path FEBE	Far End Block Error on the path (described above with the alarms).
BIP B1	Bit-Interleaved Parity check error on the Section component of the STS-12c/STM-4c overhead.
BIP B2	Bit-Interleaved Parity check error on the Line component of the STS-12c/ STM-4c overhead.
BIP B3	Bit-Interleaved Parity check error on the Path component of the STS-12c/ STM-4c overhead.

Chapter 6
Capturing Incoming Traffic

622Vu Advisor lets you capture and monitor the traffic coming in over one or both channels of an analysis device. You can save the captured cells, either to review them later or to use them as a script (or as the basis for a script).

This chapter describes the capture facility, including the use of filters during capture processing.

Starting the Capture Facility


Capture

Click the toolbar's **Capture** button to initiate capture processing (or choose **Capture** from the **Activities** menu). Then click the appropriate button to either start a new capture, or to review the traffic from a previous capture:

- Click the **New**  button to start a new capture.
- Click the **Open**  button to open a file that contains ATM cells captured previously.

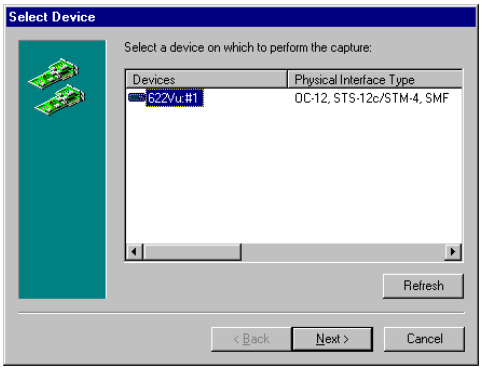
The rest of this chapter contains information as follows:

- ***Section 6.1 Starting a New Capture*** details the options available when you start a new capture, and describes the initial display.
- ***Section 6.2 Opening a Capture File*** (page 89) describes how to open an existing capture file.
- ***Section 6.3 Viewing Captured Traffic*** (page 90) tells how to view and process captured traffic. This discussion covers active (i.e., live) captures as well as captures that have been stopped and/or saved previously.

6.1 Starting a New Capture


New Capture

After you request **New Capture** processing, 622Vu Advisor displays the 622Vu undercradle (right). The 622Vu undercradle is identified by a descriptive icon (), followed by the name of the device and a number (always 1).

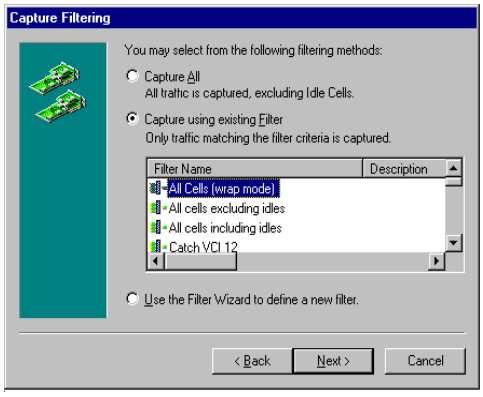


Select the device you want from the list, then click **Next**.

You'll only see those devices that are available for use currently. If the device is already performing RAM-intensive activity (such as a capture), it won't appear in the list. If you expect to see a device that isn't here, click the **Refresh** button to reevaluate its status.

Selecting Filtering Options

After making your device selection, 622Vu Advisor prompts for any filtering you want to use. By default, 622Vu Advisor captures all non-idle cells coming in over both channels. The resulting capture files can become very large, so 622Vu Advisor lets you *filter* captures, to limit their size. The form shown to the right lets you post-filter the capture. Note that this filter operates on an existing capture, it does not affect how cells are captured.



You can filter captures based on VCC, IP address, decode, or incoming channel. You can also use filters to control the way in which the traffic is captured (using a single buffer that wraps, using multiple buffers that don't wrap, etc.). Refer to Chapter **8** if you're not familiar with filtering.

As the first step to filtering a capture, you must define (i.e., establish) the filtering criteria to use. There are three ways to do this: through 622Vu Advisor's standard filterset processor (detailed in Chapter **8**), while monitoring real-time statistics (detailed in Chapter **7**), or using the capture facility's filterset wizard (described in this chapter). In the latter two cases (real-time stats and filterset wizard), you have the option of saving the filter definition, or discarding it after a

single use. The approaches offer slightly different filtering capabilities, as follows:

Table 3. Summary of Filtering Capabilities

	Can be defined in:		
Filtering Capability	**Standard FilterSets**	**Real-Time Stats Filters**	**FilterSet Wizard**
Limit the size of the buffer used (and therefore the traffic captured).	√	—	—
Wrap buffers, allowing you to reuse each buffer continually until the capture is stopped (vs. filling each buffer once).	√	√	—
Specify whether to include cells having a bad HEC.	√	—	—
Specify whether to include idle cells, and define the exact content of an *idle* cell.	√	—	—
Specify whether to include idle cells (but not define the content).	—	√	—
Request only those PDUs or cells having a particular VCC.	√	√	√
Request only those PDUs or cells having specific IP addresses (source and/or destination).	—	—	√
Request only those PDUs or cells that use a certain type of decode.	—	—	√
Request only those cells captured on a particular channel.	—	—	√

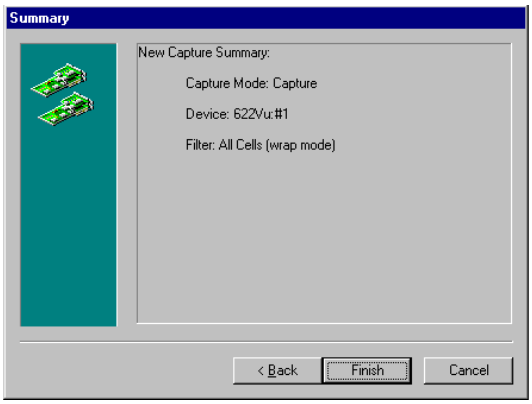
There are three filtering choices for a new capture, as described below. 622Vu Advisor always remembers the last filterset used, and prefills the window accordingly.

- Mark **Capture All** to capture all non-idle cells to a single buffer.
- Mark **Capture Using Existing Filter** to filter the capture using criteria that are set up already. If you choose this option, select the filterset that defines the traffic you want to capture. You can specify any filterset, regardless of where it was first defined. (Refer to Table 3 for a list of differences between the three approaches to defining filtering criteria.)
- Mark the last button (**Use the FilterSet Wizard to Define a New Filter**) if you want to define a new filterset on the fly, for immediate use with the current active capture. As noted in Table 3, these filtersets are based on some combination of VCC, IP address, decode, and/or channel. They can be saved or not, as appropriate to your needs.

  Note: The Real-Time Statistics processor also lets you define a new filterset on the fly, although the purpose (and therefore the definition) are somewhat different.

Verifying Your Specifications

Click **Next** when you're through, to display a summary of capture specifications:



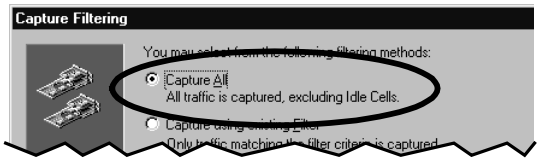
If you agree with the description shown, click **Finish** to run the capture; otherwise, click **Cancel** to go back and change the capture specifications.

Proceed to the discussion appropriate to the filtering selection you made:

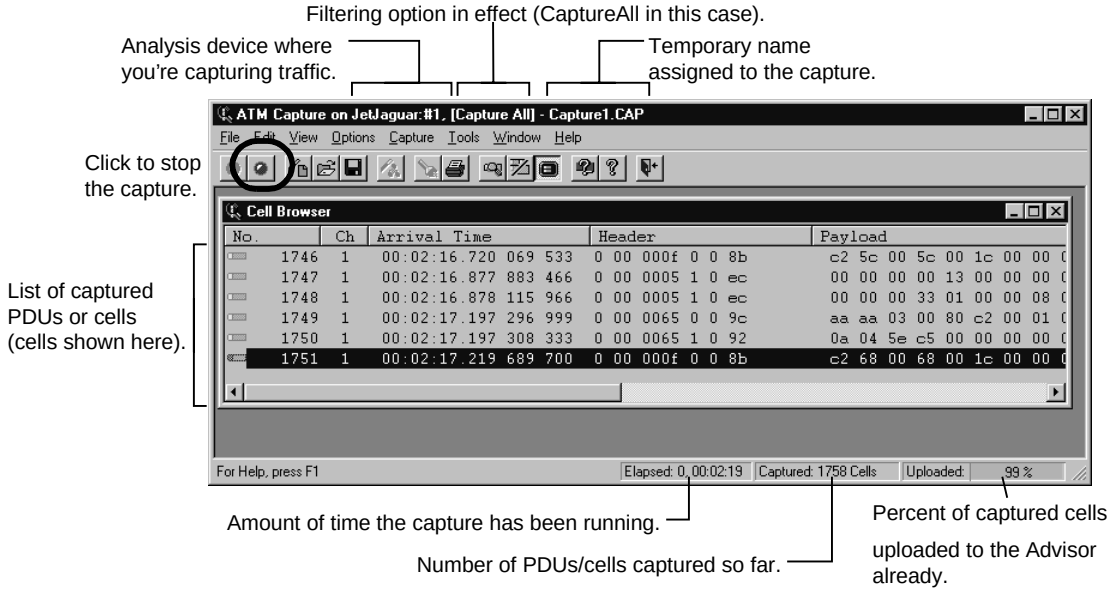
If you selected:	**Refer to:**
Capture All	*Using the Capture All Option* on page 80.
Capture Using Existing Filter	*Capturing Using an Existing Filter* on page 82.
Use the FilterSet Wizard to Define a New Filter	*Using the FilterSet Wizard to Define a New Filter* on page 84.

Note: Don't change the active cell library while the capture is running. If you change the active library with the capture window open, make sure to close and restart capture processing to ensure that it reads the current library correctly.

Using the Capture All Option



After you start a new *Capture All* capture, 622Vu Advisor displays the captured traffic in a Browser window. As described on page 113 (see *Switching Between a PDU and Cell-Level Display*), the display shows either PDU- or cell-level traffic (cell-level illustrated below):



Auto Update Display

The **Auto Update Display** button controls which of two options 622Vu Advisor uses for the display:

- **With Auto Update Display OFF**, 622Vu Advisor stops updating the window after displaying the initial screen load of cells/PDUs (but continues with its capture). Use the scroll bar to see the latest traffic captured in this case; 622Vu Advisor updates the display automatically as you scroll forward.
- **With Auto Update Display ON**, 622Vu Advisor refreshes the display continually, always showing the latest cells. The scroll bar is disabled when you use this feature.

Click the **Auto Update Display** button to toggle your selection. 622Vu Advisor remembers the last auto-update setting when it opens a user profile, and continues with that setting unless you specify otherwise.

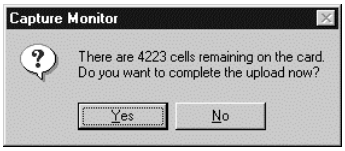
In the status bar (bottom of window), the Elapsed field indicates the amount of time the capture has been running. The Captured field indicates the number of PDUs/cells captured by the analysis device. While these PDUs/cells are on the device, they are not necessarily loaded yet to your Advisor; the analysis device typically captures traffic much faster than the traffic can be passed to the Advisor. The Uploaded field (and corresponding blue bar) indicates the percentage of captured cells/PDUs that have been forwarded to the Advisor already.

Stopping the Capture


Start (left) and Stop Capture (right)

The toolbar's **Stop Capture** button is activated during a new capture, allowing you to terminate the capture at any time. After you stop the capture:

1. The Elapsed field (in the status bar) changes to show the Start and Stop date/time.
2. The status bar also displays the total number of cells or PDUs in the capture.
3. The **Start** button becomes active (turns green), allowing you to begin a new capture using the same specifications (same device and filter).

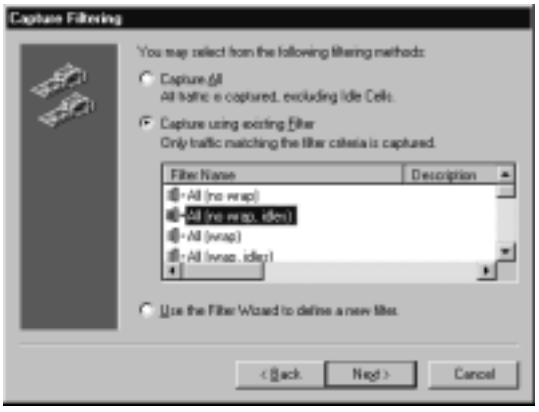


As appropriate (i.e., if you save a large capture then try to start a new capture or exit), the system displays a message telling you how many captured cells remain to be uploaded from the analysis device to the Advisor (right), and asks whether you want to finish uploading those cells. If you proceed with the upload, it can take several minutes to complete. This is because the analysis device captures traffic significantly faster (at full bandwidth) than the Advisor can load the cells from the device to its memory.

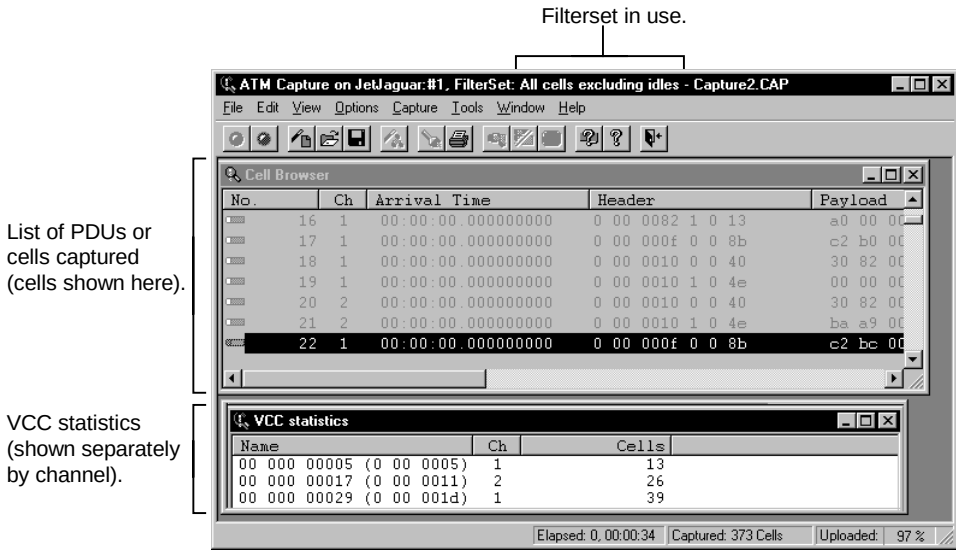
Note: After stopping a capture, you can't continue it to append additional cells. Instead, you can click **Start** to begin a new capture using the same settings.

Capturing Using an Existing Filter

When you request a new capture that uses an existing filter, you specify the filterset you want to use (shown right).



The capture display looks much the same as for the Capture-All option (see page 80), but includes an additional area showing VCC statistics:



If the Buffers Wrap…

If you're using a capture filter that wraps its buffers (described on page 140), 622Vu Advisor won't display any cells until the capture is stopped, at which time it displays the first traffic captured.

In this case, you'll see the message *wrapped* instead of a PDU/cell count in the Captured field. Use the VCC-statistics area in this case to see the number of hits in each VCC.

VCC Statistics

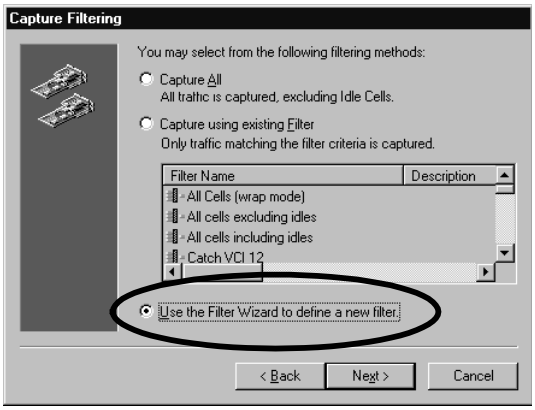
The VCC Statistics window provides statistics relating to the active filterset, and applies only if you identified a filterset for use by the capture. Each line corresponds to a different combination of VCC and channel. You can display the VCC stats via the **VCC Statistics** command (**View** menu). (See Chapter **8** for a description of filtersets if you're unfamiliar with the concept of buffers.)

Table 4. VCC Statistics

Column	Description of Content
Name	VCC over which cells have been captured, as defined within the filterset being used.
Ch	Channel over which cells have been captured.
Cells	Number of cells captured over this VCC and channel.

Using the FilterSet Wizard to Define a New Filter

When you use the filterset wizard to define a new filter, 622Vu Advisor opens a Create Filter window. This window has five tabs, each corresponding to a specific component of the filter definition.



Note: You can open this same (Create Filter) window directly from the **Tools** menu, by choosing the **Create Filter** command. Processing is the same as when you open it from the new-capture wizard, except that there's no verification of the capture specifications. When you close the Create Filter window in this case, simply choose the **Start** command (**Capture** menu) to begin a new capture with the filterset you just defined.

Click each tab in turn, filling in the specifications you want:

- Use the **VCC** tab to limit the capture to a specific set of VCCs.
- Use the **IP** tab to limit the capture to a specific set of IP addresses.
- Use the **Decode** tab to limit the capture to specific types of decode.
- Use the **Other** tab to restrict the capture to traffic coming in over Channel 1 or 2.
- Use the **Save** tab to indicate whether to save the filter for future use. If you don't save the filter, it will not be available after you stop the capture.

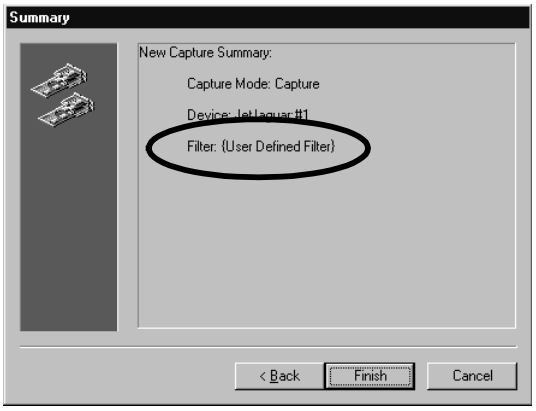
When you're through, click **OK**. 622Vu Advisor stores the filterset under the name you assign via the Save tab (see page 88). Then it verifies your capture specifications and continues with the capture.

If you save the filterset, it will be available whenever you start a new capture, from the new-capture wizard. (You can't view or edit the detailed specifications of the filterset, once defined; however, there's no limit to the number of different new-capture filters you can define.)

The new filter has one buffer, called Traffic, that contains all the filtering specifications. Criteria are ANDed between tabs, but ORed within any particular tab. Thus, when 622Vu Advisor uses the new filter, it captures all traffic having any of the VCC(s) specified, *and* any of the IP address(es) specified, *and* any of

the decodes specified, *limited to* the traffic coming in over the channel(s) specified.

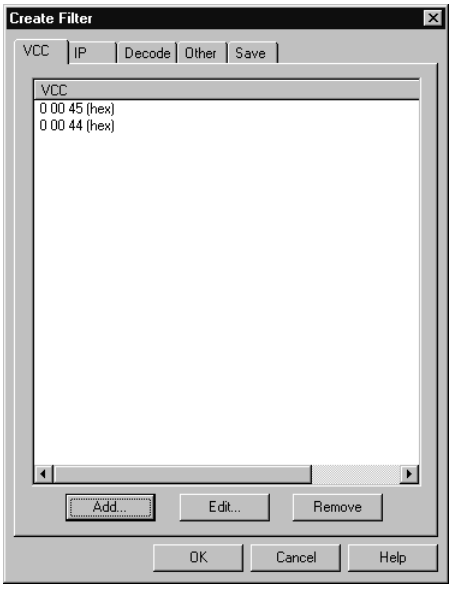
When you're through defining the filterset, 622Vu Advisor displays the new-capture specifications for verification (including what filterset you're using, as described on page 80):



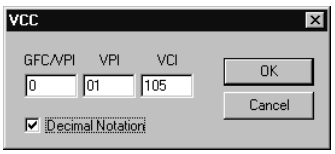
Then the new-capture session proceeds as described above under *Capturing Using an Existing Filter* (page 82).

Using the VCC Tab During FilterSet Definition

Use the VCC tab (right) to limit the capture to only those cells/PDUs having a specific VCC(s). By default (i.e., if this tab is blank), the filterset logic captures traffic for all VCCs.



- Click **Add** to add a VCC to the list. 622Vu Advisor opens a dialog box that lets you specify the components of the VCC individually:



You must specify the full VCC explicitly; you cannot ignore any field positions. You can choose to use decimal or hexadecimal notation. Mark the box at the bottom for decimal; leave it blank for hexadecimal.

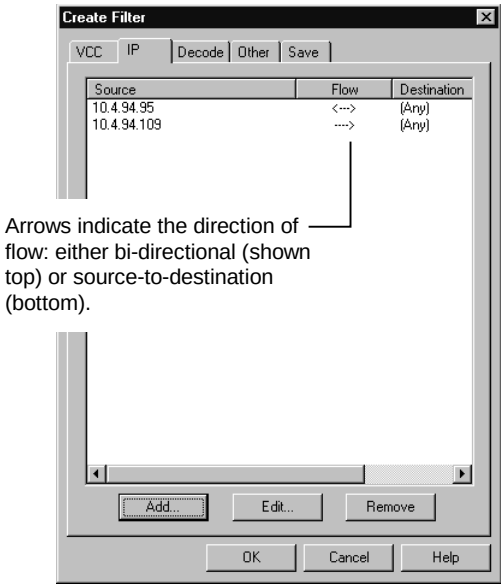
Click **OK** when you're through, to add the VCC to the list.

- To change a VCC, select the VCC in the list and click **Edit**. 622Vu Advisor prompts for the changes using a dialog similar to the one described above for an add.
- As necessary, select a VCC and click **Remove** to delete it from the list.

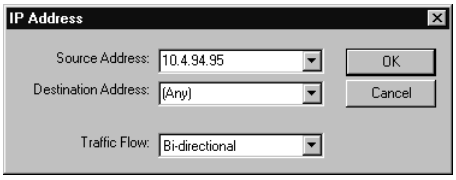
When you're through with the VCC tab, click **OK** to save your settings.

Using the IP Tab During FilterSet Definition

Use the IP tab to limit the capture to only those cells/PDUs having a specific IP address(es). You can specify source and/or destination addresses, or combinations of source/destination addresses. By default, the filterset logic captures *any* (i.e., all) IP addresses.



- Click **Add** to add an IP address (or pair of IP addresses) to the list. 622Vu Advisor opens a dialog box that lets you specify a source and/or destination address, as well the direction of traffic flow (bi-directional or source-to-destination):



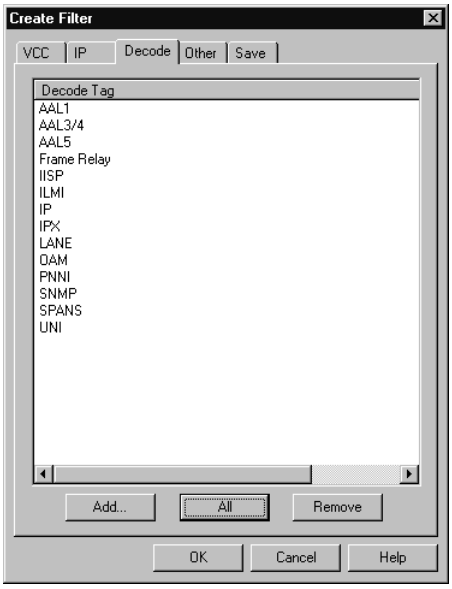
You must specify each address explicitly, but you can select "any" or "****" from either list, to request a match to any IP address for that field (e.g., to match a specific source address to any destination address, or any source address to a specific destination address). Click **OK** when you're through to

add the address(es) to the IP list. The arrows under the Flow column indicate the selected direction of flow.

- To change an address (or pair of addresses), first select the address(es) from the list, then click **Edit**. 622Vu Advisor prompts for the changes using a window similar to the one described above for an add.
- As necessary, select an address (or pair of addresses), then click **Remove** to delete it from the IP list.

When you're through with the IP tab, click **OK** to save your settings.

Using the Decode Tab During FilterSet Definition



Use the Decode tab to limit the capture to only those cells/PDUs that use a certain type of decode. By default, 622Vu Advisor captures *all* decodes.

1. Click **Add** to add a specific type of decode to the list. 622Vu Advisor opens a dialog box that lets you enter a decode directly, or select one from the drop-down list:

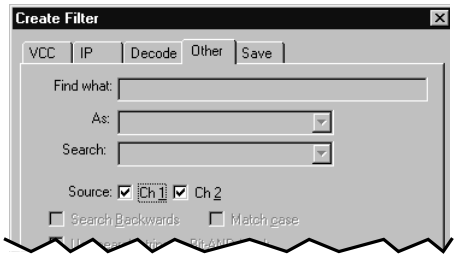
   Click **OK** when you're through, to add the decode to the list.

   If you specify a type of decode that isn't in the drop-down list, 622Vu Advisor accepts (and uses) it as entered. 622Vu Advisor does *not* try to verify user-specified values.

2. Click **All** to add all the decodes available in the drop-down list.
3. As necessary, select a type of decode and click **Remove** to delete it from the list.

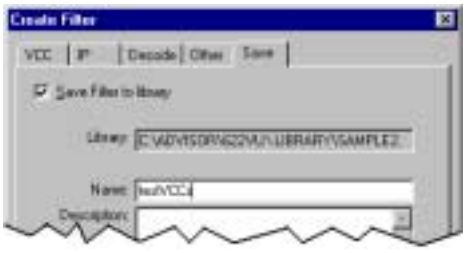
When you're through with the Decode tab, click **OK** to save your settings.

Using the Other Tab



Use the Other tab to limit the capture to only those cells/PDUs coming into the analysis device on a particular channel. Select Channel (Ch) 1 and/or Channel (Ch) 2, then click **OK** to save the settings.

Using the Save Tab



Use the Save tab to specify whether or not to save the filterset. Mark **Save File to Library** if you want to save the filterset in the cell library; leave it blank to use the filterset for the active capture (after which it's deleted).

If you save the filterset, assign it a name and enter any comments you want to associate with it.

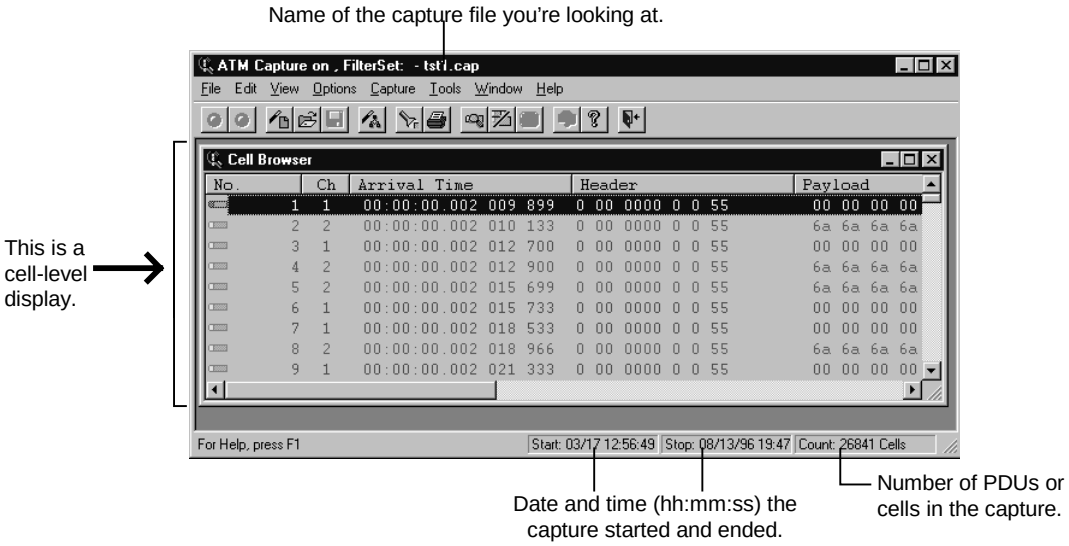
Note: The filtering criteria specified here are different from those available through 622Vu Advisor's standard filterset editor (described in Chapter **8**); therefore, you can't access a new-capture filter through the editor. It's important, then, that you provide a clear description of the filterset, as necessary to help you recall its purpose.

6.2 Opening a Capture File


Open

When you open an existing capture file, 622Vu Advisor uses the standard file-open dialog box to prompt for the name of the (.cap) file you want to see. Captures can be stored anywhere, but by default reside in 622Vu Advisor's \capture directory. Open the file you want.

622Vu Advisor displays the captured traffic:



The capture display shows traffic at either the PDU or cell level, with one row for each PDU or cell. You can switch back and forth between a PDU- and cell-level display, as necessary to best analyze the data captured. (See page 113 for related instructions.)

The Start and Stop times (displayed in the status bar at the bottom of the window) indicate the date and time the capture was started and completed. The Count field (bottom right) displays the total number of cells or PDUs in the capture. A blue bar moves across the Count... field as the file loads, to indicate the progress.

From this display, you can request a decode of the PDU information, and manipulate the file as necessary to analyze it (for example, to locate specific cells or PDUs). You can also create subsets of cells based on specific criteria, save subsets (typically under a different name), and/or generate scripts from the data in the file. The next section describes these features in more detail.

6.3 Viewing Captured Traffic

This section describes the tools available for analyzing the captured data, first presenting a description of the basic display and all menu commands:

- ***Description of the Basic Display*** (page 90) describes the basic data displayed in the Capture File Browser window.
- ***Capture-Facility Menu Commands and Toolbar Buttons*** (page 92) describes the menu options and toolbar buttons.

The remaining sections cover the menu commands that haven't been described yet, using a left-to-right, top-to-bottom approach:

- ***Saving the Capture*** (page 97) describes how to save a capture (or subset of a capture).
- ***Displaying the PDU*** (page 97) describes how to decode the PDU-level information for a specific PDU(s)/cell(s).
- ***Exporting a Capture File*** (page 101) describes how to export the capture file in any of three formats (decode, CSV, or NG Sniffer).
- ***Using the Goto Feature*** (page 103) tells how to position the display at a specific PDU/cell.
- ***Finding Specific Cells or PDUs*** (page 103) tells how to locate a specific PDU/cell using the Find facility.
- ***Creating Subsets of PDUs/Cells*** (page 107) tells how to create a subset of captured cells.
- ***Requesting More Detail For a PDU or Cell*** (page 112) tells how to toggle display of more details about each PDU or cell displayed.
- ***Switching Between a PDU and Cell-Level Display*** (page 113) tells how to switch back and forth between a PDU- and cell-level display.
- ***Creating a Script From a Capture File*** (page 113) tells how to create a script from the capture file.

Some of these tools are available during an active capture, while others are only available after the capture is stopped, or from a previously saved capture, noted in Table 5 (page 93).

Description of the Basic Display

In the main Capture File Browser window, each row is numbered sequentially starting with 1. This lets you determine your position in the file.

Depending on whether you're in PDU Summary Mode (see page 113), each row displays either cell- or PDU-level information (and the title of the window is *Cell Browser* or *PDU Browser*, respectively). The traffic displays in order according to the time that it was captured, with the following information for each PDU or cell:

Column		
Cell Display	**PDU Display**	**Description**
No.	No.	Sequential number assigned to each row (i.e., to each cell or PDU). The icon to the left of this number indicates the type of data shown: **Icon** **Indicates the Row Contains...**  PDU-level information.  Individual cells.  Traffic that has bad HEC data.
Ch	Ch	Channel where the traffic was (or is being) captured.
Arrival Time	Arrival Time	Arrival Time: Time associated with the cell or PDU. Initially traffic displays in order according to the time that it was captured, and this field is labeled as the Arrival Time (*hh:mm:ss.nnnnnnnnn*, shown to a resolution of 33 ns). You can change this to display a delta time between cells/PDUs, or to establish a particular cell/PDU as a baseline from which all other (relative) times are measured. Refer to Table 5 (page 93) for the specifics of these options.
Header	VCC	Cell header data (for a cell-level display), or PDU-level VCC information (for a PDU-level display). Shown in decimal or hexadecimal format to correspond to the default header format specified in the user profile (General tab).
Payload	PDU Summary	Payload data, in hexadecimal format (for a cell-level display), or PDU summary-level information (for a PDU-level display). For a PDU-level display, this area provides a high-level overview of the protocol layering in the PDU. As appropriate, you'll see protocol-specific information in the PDU summary line, such as the LAN protocol (IP, IPX, etc.) source and destination addresses.

Controlling the Color Used

622Vu Advisor uses color to highlight the captured traffic. You can control the colors used through your profile definition. Choose the **User Profile** command from the **Options** menu to change the color(s) in the display. 622Vu Advisor opens the dialog shown to the right.

Click to the Color tab, then select the color you want for each category of display:

Display	Color used for...
[Ch 1] Cell Default	Basic display for cells captured on Channel 1.
[Ch 2] Cell Default	Basic display for cells captured on Channel 2.
Bad HEC	Cells that have a bad HEC.
PDU	All the cells in a particular PDU.

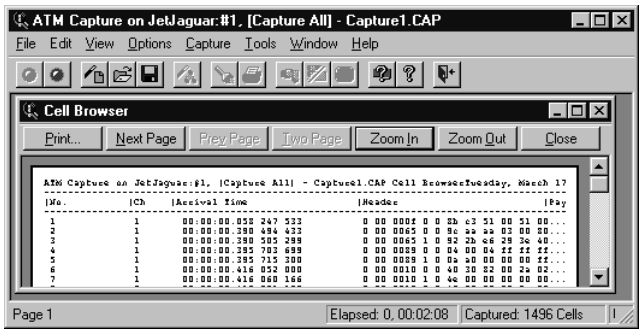
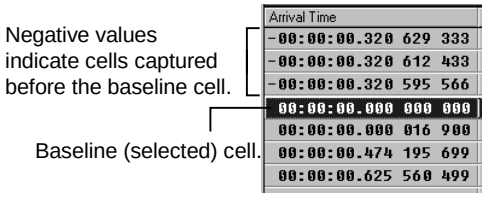
To select a color, first click the double-right arrow, then use the standard Windows Color dialog box to choose the color you want.

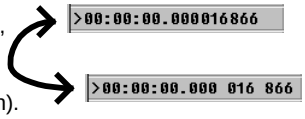
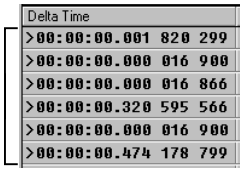
Capture-Facility Menu Commands and Toolbar Buttons

Table 5 describes each command and toolbar button available for use during capture processing. Some of these tools are available during an active capture, while others are only available after you stop a capture, or when you open a (previously saved) capture file.

Table 5. Capture-Facility Menu Commands and Toolbar Buttons

Menu Command	Toolbar Equivalent	Available from: Active Capture	Stopped Capture	Saved Capture	Used to…	See Page
File						
New		√	√	√	Initiate new-capture processing.	78
Open		√	√	√	Open an existing capture file.	89
Close	—	√	√	√	Close the active capture file (available when a capture file is open).	—
Save		√	√	√	Save the capture file you're viewing, modifying it to include only the currently displayed cells, as appropriate (generally a subset of the initial display).	97
Save As	—	√	√	√	Save the capture (or currently displayed subset) under a new name.	97
Export	—	—	√	√	Export the contents of the entire capture (or subset if you've created one). There are three choices of format: decoded text, CSV, or Network General Sniffer. ***Note***: You can create decoded text for a single PDU by double-clicking it in the basic display.	101
Print		—	√	√	Print the current window on your default printer: either the entire capture file or the current PDU. (The PDU prints if PDU decode is displayed and has focus.)	—
Print Preview	—	—	√	√	Display a preview of what would print via the **Print** command. Applicable when the **Print** command would print the entire capture (i.e., when the PDU is not displayed and/or does not have focus). 622Vu Advisor opens a window that lets you scroll through the document, zoom in and out, and print, as necessary:	—

Menu Command	Toolbar Equivalent	Available from: Active Capture	Stopped Capture	Saved Capture	Used to…	See Page
						
Print Setup	—	√	√	√	Open your standard print-setup dialog box.	—
Exit		√	√	√	Close the Capture utility.	—
Edit						
GoTo	—	√	√	√	Position the display at a specific cell or PDU in the capture, identified by number.	103
Find		—	√	√	Locate a particular cell or PDU based on a search string value, and/or specific VCC settings.	103
Find Prev(ious)	—	—	√	√	Position the cursor at the cell or payload located by the previous Find.	103
Find Next	—	—	√	√	Repeat the last Find.	103
Create Subset	—	—	—	√	Create a subset of captured cells or PDUs, based on a search string value and/or specific VCC settings.	107
Undo Last Subset	—	—	—	√	Reverse the last Create Subset operation to display the previous subset (or the initial display, if this is the first subset).	108
Set Baseline	—	√	√	√	Display Arrival Time relative to the time when the currently selected cell was captured: 	—
Clear Baseline	—	√	√	√	Clear the baseline established last via Set Baseline.	—

Menu Command	Toolbar Equivalent	Available from: Active Capture	Stopped Capture	Saved Capture	Used to…	See Page
View						
Detail Display		√	√	√	Toggle display of a more detailed view of the cell or PDU data.	112
PDU Summary Mode		√	√	√	Toggle an option that summarizes all the cells for a PDU on one line. The line comprises a terse description of the protocol layering for the PDU.	97
Auto Update Mode		√	√	—	Toggle an option that applies during an active capture, and that refreshes the display once per second, to always show the latest cells. With this toggled ON there's no scroll bar, but the most recently captured cells always display. With this option OFF, you can use the scroll bar to see the latest captured data.	81
Alternate Time Format	—	√	√	√	Toggle display of the Arrival Time to delineate decimal positions within the seconds field with spaces, or to reverse this delineation: Use this command to separate milliseconds, microseconds, and nanoseconds (or to remove the separation). 	—
Cell Delta Time	—	√	√	√	Toggle display of the Arrival Time to show the time elapsed since the previous cell was captured (option is ON), or a time relative to when the capture was started (option is OFF): Choose this command to show the time *elapsed* between each cell. 	—
VCC Statistics	—	√	—	—	Display VCC statistics during an active capture (applies only when using a filterset for the active capture). If the VCC statistics are already opened, this command changes the focus to the statistics window.	83
Toolbar	—	√	√	√	Toggle display of the toolbar.	—
Status Bar	—	√	√	√	Toggle display of the status bar (bottom of window).	—
PDU Raw Data	—	√	√	√	Toggle display of the PDU's payload, in both hex and ASCII format (applicable only when PDU decode is displayed and has focus).	98

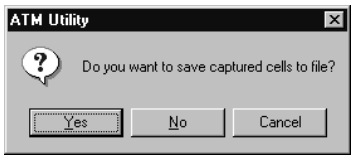
Menu Command	Toolbar Equivalent	Available from: Active Capture	Stopped Capture	Saved Capture	Used to…	See Page
PDU Cell List	—	√	√	√	Toggle display of a list of cells in the PDU displayed (applicable only when PDU decode is displayed and has focus).	99
Options						
Font	—	√	√	√	Open a dialog box through which you can control the font used to display the active view window: either the standard Capture File Browser window or a decoded PDU window.	—
Default Font	—	√	√	√	Redisplay the currently active view window using the default font.	—
User Profile	—	√	√	√	Specify preferences to use when decoding captured cells, and the colors to use when displaying the capture.	92 & 100
Capture						
Start		—	√	—	Begin a new capture using the same specifications as the capture you're viewing; applicable after stopping an active capture. (You can't continue a stopped capture to append additional cells. Instead, click **Start** to begin a new capture using the same settings.)	82
Stop		√	—	—	Terminate an active capture (applicable when a capture is running). After you stop the capture, the **Start** button becomes active (turns green), allowing you to begin a new capture using the same specifications (same device and filter).	82
Tools						
Create Script		—	—	√	Create a script from a capture file that's been saved previously. You can use and maintain the script like any other script, using 622Vu Advisor's scripting facility.	113
Create Filter	—	—	√	—	Define a filterset on the fly, for immediate use during new-capture processing. The filterset is based on VCC, IP address, decode, and/or channel, and its definition is the same as described for new-capture processing.	84
Describe Capture Device		√	√	—	Display information about the analysis device used for the active capture (or the most recent capture, if no capture is running currently): device identification, network information, hardware specifications, and available memory.	—
Window						
Cascade	—	√	√	√	Cascade all open windows.	—
Tile Horizontally	—	√	√	√	Arrange all open windows horizontally, so you can see them together.	—

Menu Command	Toolbar Equivalent	Available from: Active Capture	Stopped Capture	Saved Capture	Used to…	See Page
Tile Vertically	—	√	√	√	Arrange all open windows vertically, so you can see them together.	—
Arrange Icons	—	√	√	√	Align icons for all minimized windows across the bottom of your monitor display.	—
Help	—	√	√	√	Display online Help and/or general information about the Capture utility.	—

Saving the Capture

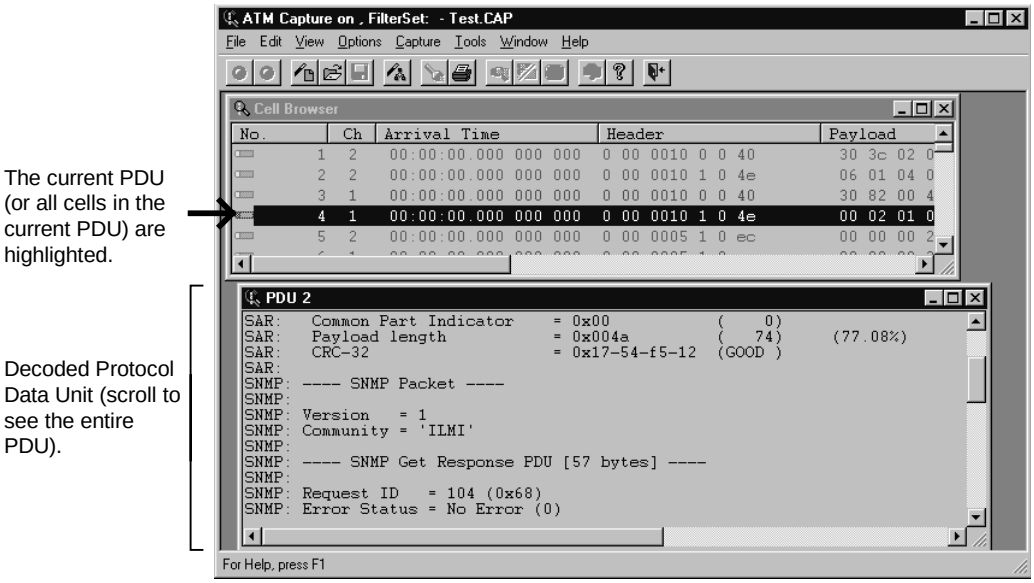
At any time, you can save the capture as it's displayed currently, using the **Save** or **Save As** commands from the **File** menu: **Save** to resave the current file under the same name; **Save As** to save the file under a different name. In the latter case, 622Vu Advisor opens a standard dialog box that you'll use to assign a name to the capture file (*name.cap* format). If you omit the suffix, 622Vu Advisor assigns it correctly. Captures can be stored anywhere, but typically reside in 622Vu Advisor's \capture directory.

If you click **Exit** or **New** (capture) before saving the previous capture, 622Vu Advisor asks whether you want to save the capture before proceeding (illustrated to the right for an **Exit** before saving).



Displaying the PDU

After you stop an active capture, or when you open a capture file that was saved previously, 622Vu Advisor lets you decode the captured traffic at the PDU level. (You can't decode PDU-level information during a live capture.) Double-click a cell or PDU to decode that PDU. 622Vu Advisor opens a Decode window that displays Protocol Data Unit (PDU) information for the currently selected PDU/cell. The title bar identifies the PDU you're looking at:



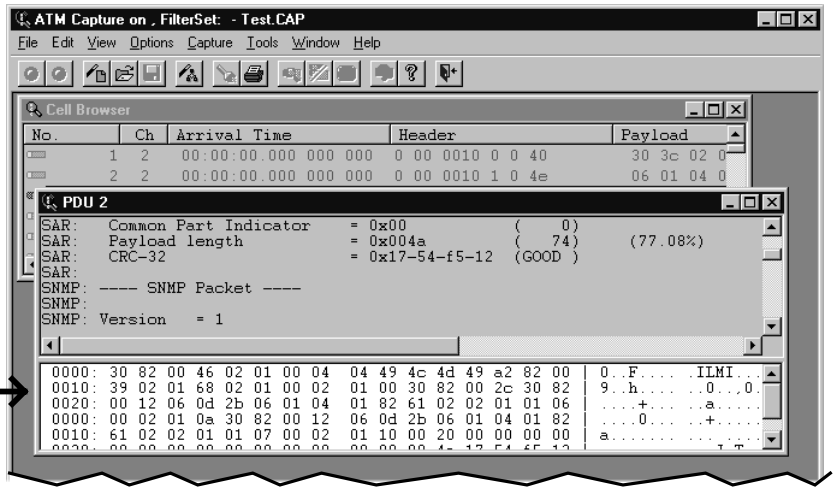
- If you're looking at a PDU-level display, 622Vu Advisor highlights the currently selected PDU.
- If you're looking at a cell-level display, 622Vu Advisor highlights all cells in the same packet as the cell that's currently selected.

Scroll through the decode window to see the full PDU display. 622Vu Advisor decodes as much of the PDU as it can, and displays this information in a logical form. The specifics of this vary depending on the type of data encapsulated in the PDU (shown above for an AAL5 PDU).

You can identify preferences for use in decoding captured ATM traffic through your profile definition; specifically, you can specify any VCCs that should always be interpreted using a particular decode. See *Specifying Decode Preferences* starting on page 100 for more information.

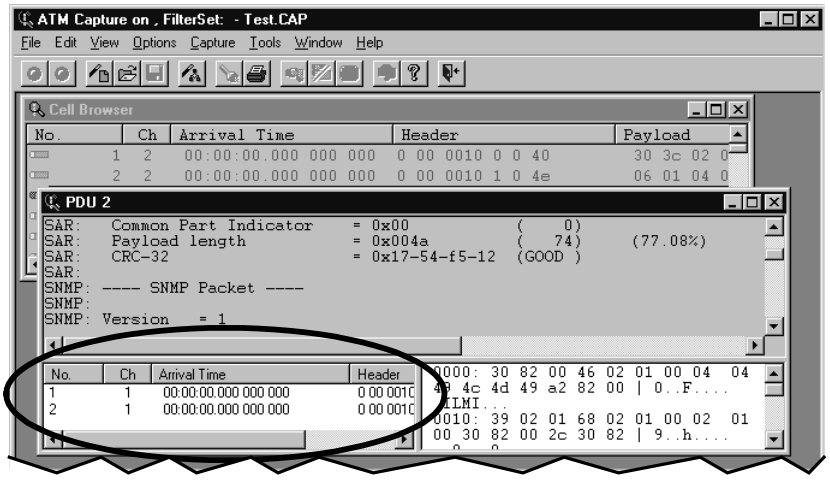
Two **View** menu commands let you toggle display of additional PDU detail:

- Choose **PDU Raw Data** to toggle display of a hex and ASCII translation of the payload:



Binary translation of the payload (hex left and ASCII right).

- Choose **PDU Cell List** to toggle display of a list of cells in the PDU:



Cell list toggled on (in addition to the binary data (right)).

You can open any number of decode windows. As you click different lines in the main display, the PDU window shows information corresponding to that line — even as you jump to different PDUs in the main display. The most recently opened window is reserved for tracking purposes, however; 622Vu Advisor always displays the decode for the currently selected cell/PDU using this window.

If you want to compare decodes, open two or more decode windows. Any windows except the most recent are static, and track only the specific PDU for which they were initiated. The Window menu lists each separate decode window, so you can move easily from one to another. You can also use the tiling feature, to arrange multiple decodes so you can compare them.

It's sometimes easier to decode the entire file at once, rather than one PDU at a time. Use the **Export** (to decode) command from the **File** menu to do this (page 101).

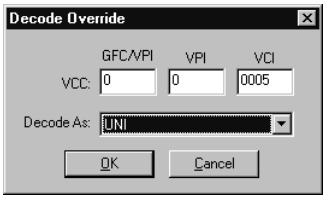
Specifying Decode Preferences

622Vu Advisor lets you specify preferences for use in decoding captured ATM cells. Choose the **User Profile** command from the **Options** menu to do this. 622Vu Advisor opens the window shown to the right.

Click the Decode tab, then proceed as follows:

- Use the **Decode Overrides** area to identify any VCCs that should always be decoded a particular way (for example, as using AAL1 ATM Adaptation layering, or PNNI or UNI signaling). This feature forces all cells having a particular VCC to be decoded using the specified protocol. Click **Add**, **Edit**, or **Delete**, as appropriate to the processing you want (respectively, to add a new VCC, edit an existing specification, or delete the selected VCC).

  For add/edit processing, 622Vu Advisor opens this dialog box:



  Specify the VCC you want using the top three boxes, then use the drop-down list to select the type of decode you want to associate with that VCC. (When you specify the VCC, use either hexadecimal or decimal format to correspond to the Header Format specified in the profile definition's General tab, described on page 51.) Click **OK** when you're through to save the change.

  As installed, the system supplies a set of standard VCCs that are commonly decoded a particular way. If you want to restore these default VCCs, click the **Default** button.

- Use the **UNI Version** field to specify which UNI decode to use (defaults to 3.1).
- Use the **MIB File** field to identify a MIB (Management Information Base) for use when decoding SNMP or ILMI PDUs. (See page 97 for information about decoding PDUs.) If you identify a valid MIB filename here, 622Vu Advisor uses the values in that file to convert MIB Object Identifiers (OIDs) to their textual representation; otherwise (without a MIB) 622Vu Advisor only shows OIDs in their numerical form.

  You can specify any valid MIB text (.txt) file here. As necessary, use the **Browse** button to scan your file system for the MIB you want. If you inadvertently identify a non-MIB text file (or a MIB file that isn't recognizable to 622Vu Advisor's parser), the system returns a file parsing error during PDU processing, then continues processing without the file.

Exporting a Capture File

The **Export** command from the **File** menu lets you export the entire capture file in any of three formats:

- Decoded Text — Decodes all PDUs at once, writing the results of the decode to a flat text file. The resulting text file can be quite large. If the capture file is 1MB, expect a decoded text file in the range 8–12 MB.
- CSV Format — Exports the entire capture file in CSV format (readable by Excel).
- Network General Sniffer Format — Exports the entire capture file in NG Sniffer format (.enc).

When you choose this command, 622Vu Advisor opens a standard Save As dialog box. Identify the new file to which you want to export the capture (format varies by type), then click **OK** to proceed.

622Vu Advisor displays its progress as it creates the file, then issues a message telling you that it's through. (You can hide the progress dialog box by clicking the **Hide** button, or stop the process altogether by clicking **Abort**.)

Saving a File for Expert Analysis

The ATM 622 application can save a data file for import into the Agilent Advisor LAN. This gives you expert analysis capability for your LAN traffic being carried over an ATM 622 link. You will be able to analyze your ATM 622 traffic

and then when the ATM is proven to be reliable evaluate the same traffic with the Advisor LAN to find existing LAN problems.

To use the Advisor LAN on your ATM 622 traffic you will need to do the following steps:

1. Connect the ATM 622 undercradle to the network under test and capture desired LAN traffic using any VCC filters desired. Filters can be used to limit the amount of traffic to only the desired traffic, if no filters are used then all LAN traffic running over AAL-5 is analyzed.

2. Save the captured traffic to a data file on the hard drive. This file can later be opened by the ATM 622 application and additional post process filters applied to reduce the amount of traffic if desired.

3. Start the Advisor LAN found under the Start menu. Use the Start | Agilent Advisor | ATM Analysis | Off-Line LAN-ATM Expert path. This will open the program with a default set of parameters. You can now import the ATM 622 file into this application. Select [File] then [Open (Load Data)]. You will now see a list of all of the *.dat files that have been saved by the Advisor LAN. As a part of the open window you should see an input box labeled "Files of type". You will need to click on the pull-down arrow and select the file type identified as "*.cap". This will now apply a file filter to only show you the ATM 622 files and most likely the file list window will be blank. You will need to use the directory navigator icon in the open box to move up until the "Look in" box has the "Advisor" directory listed. Now select "622Vu" then "Capture" and now you should see the ATM 622 files that have been stored.
   Note: If you change the default directory for the file save you will need to change to that directory to do the import.

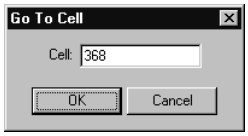
4. Once you have a list of the ATM 622 files you can select one file to open. Click one time and wait for the import function to validate the file be verify that you can open this file. You will see a "Created by:" box that lists the application used to create the file if it can be imported along with a yellow indicator. This yellow indicator lets you know that you have selected a file that will need to be converted to the Advisor LAN format. Click on the "Open" button to start the import function. NOTE: if the ATM file does not have LAN traffic carried over AAL-5 the import will fail and you will see a missing file notification.

5. Once you have imported the file you will be able to use the Advisor LAN decode engine to decode the LAN traffic in detail. You can also let the "Expert Analyzer" look through the traffic by switching to the Expert screen. From the "Run" pull-down select "Run From Buffer" to start the expert and select the range of frames to evaluate. You will then be able to watch the

screen update as the traffic is analyzed and reported on the screen. When the run has completed you will be able to view the results and Commentator notes that resulted. For more details on the Advisor LAN capabilities please review the Advisor LAN documentation the was shipped with and on your Advisor.

6. You can review the ATM 622 traffic and quickly identify network problems. If you need to you can change back to the ATM 622 application and refine your capture and save to a new data file or capture new traffic to review as required until your network problems are solved.

Using the Goto Feature



The **Goto** command from the **Edit** menu lets you locate a particular PDU or cell (as appropriate to the level of information currently displayed), and make that PDU/cell active. Identify the cell/PDU by number (shown here for a cell), then click **OK**.

Finding Specific Cells or PDUs


Find

The **Find** button (or command from the **Edit** menu) lets you locate a cell or PDU based on: a specific (ASCII or hex) value in the payload, the channel where the cell was captured, specific settings in the VCC, source or destination IP addresses, and/or the type of decode used.

When you request a Find, 622Vu Advisor opens a window through which you can qualify the PDU/cell you want. This window has three tabs:

- Use the **General Find Criteria** tab for general specifications.
- Use the **IP** tab to locate specific source or destination IP addresses.
- Use the **Decode** tab to locate a specific type of decode.

When you're through, click **OK** to confirm your settings and find the first PDU/cell matching your specifications.

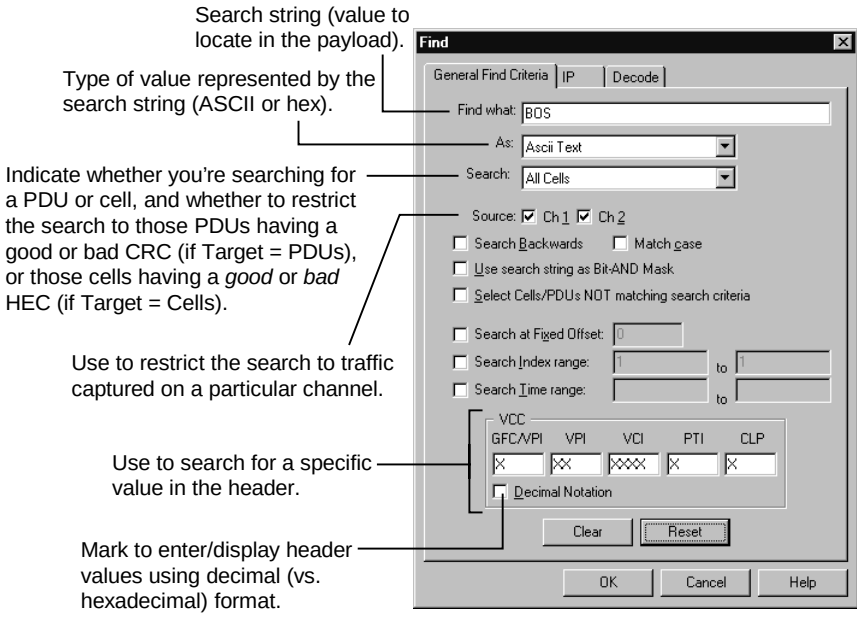
Multiple criteria are ANDed between tabs: 622Vu Advisor finds the first PDU or cell that matches all the General Find Criteria *and* that has one of the IP address(es) specified, *and* that has any of the decodes specified.

Repeating a Find

After you execute a **Find**, you can use the **Find Prev(ious)** (<Shift-F3>) or **Find Next** (<F3>) commands, respectively, to position the cursor at the previously found cell/PDU, or to repeat the Find moving forward through the capture.

Using the General Find Criteria Tab

The General Find Criteria tab lets you describe the basic search criteria:



Follow these steps to fill in these criteria:

1. If you want to search for a value in the payload area:

   Specify the search string in the Find What box.

   Use the As drop-down list to indicate whether you're looking for ASCII text or a hex value.

2. If you want to search for a value in the cell header, use the **VCC** area to specify the value you want. Header values can be entered/displayed in decimal or hexadecimal format. Mark the **Decimal Notation** box if you prefer decimal; otherwise leave it blank.

   If you specify *both* the Find What and VCC areas, the system looks for the search string within the payload of *only those cells* where the header fields match your VCC values.

3. Use the **Search** drop-down list to indicate whether to search all PDUs or cells; or to limit your search to only those PDUs having a good or bad CRC, or only those cells having a good or bad HEC. Any of the PDU/CRC values request a search by PDU. The cell/HEC values request a cell-by-cell search

of the capture file. 622Vu Advisor only displays those options that are appropriate to the level of detail shown in the main display (PDU or cell).

4. In the **Source** area, indicate whether to search traffic captured on Channel 1, Channel 2, or both.

5. Mark **Search Backwards** to begin searching for the specified value at the end of the capture file; otherwise (with this box unmarked) the system starts at the beginning of the file.

6. If you're searching for an ASCII value, indicate whether to **Match Case** or not. Leave this box blank for a non-case-sensitive search.

7. If you want to treat the Find What and/or VCC values as a bit-match pattern, mark the **Use Search String as Bit-AND Mask** box. With this box marked, 622Vu Advisor interprets the Find What and/or VCC values as a bit-match pattern, returning the first cells/PDU that match any of the ON bits in the mask. For example, if you specify a hex 03 (binary 0000 0011) in the search string, fixed at offset 15, the **Find** looks for the first cell whose payload has either of the low-order two bits set.

8. Optionally, mark the **Select Cells/PDUs NOT Matching Search Criteria** box to toggle between selecting values that *match* or *don't match* the other specifications. With this box marked, the select/reject decision that's made by taking all the other criteria into account is reversed at the very end of the decision-making process; any cells or PDUs that would normally be rejected are accepted, and any cells/PDUs that would normally be accepted are rejected.

9. The **Search at Fixed Offset** field applies if you're searching for a string in the payload. It allows you to specify an offset from the beginning of the payload where you want to begin the search. Valid offsets are in the range 1–48 for a cell-by-cell search; 1–65,535 for a PDU search. If you leave this field blank, 622Vu Advisor searches the entire payload.

10. The **Search Index Range** field lets you limit the search to a particular range of cells or PDUs, identified by the number displayed to the left of each cell/PDU in the capture-file display. Specify a starting (i.e., low) and/or an ending (i.e., high) number to identify the range you want to search. These default, respectively, to the first and last cells in the capture file.

11. The **Search Time Range** field lets you limit the search to cells/PDUs captured during a specific time period. Specify the *from* (left) and *to* (right) times using an *hour*:*minute*:*second* format, with an optional 9 decimal positions to the right of the seconds field: *hh*:*mm*:*ss*.*nnnnnnnnn*

Use the **Clear** and **Reset** buttons at the bottom of the form to set all values to their default settings, or to redisplay the last saved set of values, respectively. (The **OK** button saves values.)

Using the IP Tab During Find Processing

Use the IP tab (illustrated on page 86) to limit the search to only those PDUs/cells having specific IP addresses. You can specify source and/or destination addresses, or combinations of source/destination addresses. By default, 622Vu Advisor searches *any* (i.e., all) IP addresses.

- Click **Add** to add an IP address (or pair of IP addresses) to the list. 622Vu Advisor opens a dialog box (right) that lets you specify a source and/or destination address, as well the direction of traffic flow (bi-directional or source-to-destination).

  You must specify each address explicitly, but you can select "any" or "****" from either list, to request a match to any IP address for that field (e.g., to match a specific source address to any destination address, or any source address to a specific destination address). Click **OK** when you're through to add the address(es) to the IP list. The arrows under the Flow column indicate the selected direction of flow.

- To change an address (or pair of addresses), first select the address(es) from the list, then click **Edit**. 622Vu Advisor prompts for the changes using a window similar to the one described above for an add.

- As necessary, select an address (or pair of addresses), then click **Remove** to delete it from the IP list.

When you're through with the IP tab, click **OK** to save your settings.

Using the Decode Tab During Find Processing

Use the Decode tab (illustrated on page 87) to limit the search to those PDUs/cells that use a certain type of decode. By default, 622Vu Advisor searches *all* decodes.

1. Click **Add** to add a specific type of decode to the list, then use the dialog box (right) to enter a decode directly, or to select one from the drop-down list. Click **OK** when you're through, to add

the decode to the list.

If you specify a type of decode that isn't in the drop-down list, 622Vu Advisor accepts (and uses) it as entered. 622Vu Advisor does *not* try to verify user-specified values.

2. Click **All** to add all the decodes available in the drop-down list.
3. As necessary, select a type of decode and click **Remove** to delete it from the list.

When you're through with the Decode tab, click **OK** to save your settings.

Creating Subsets of PDUs/Cells

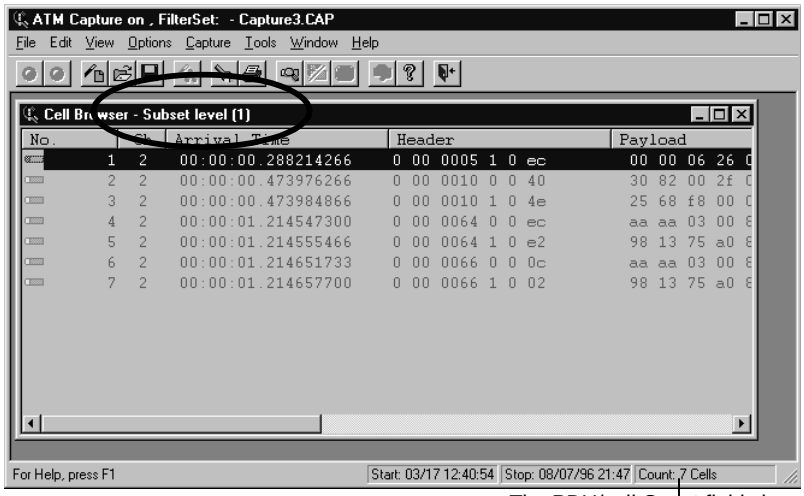
622Vu Advisor lets you create any combination of subsets — including nested subsets — from a capture file (assuming the capture is finished). Subset processing is similar to **Find** processing (page 103), except here we're locating *all* cells or PDUs that match certain specifications, then creating a subset from them.

When you request a subset (**Create Subset** from the **Edit** menu), 622Vu Advisor opens a window through which you can qualify the subset you want. This window has three tabs:

- Use the **General Subset Criteria** tab to define general subset specifications.
- Use the **IP** tab to identify specific IP addresses to include in the subset.
- Use the **Decode** tab to identify specific types of decodes you want to include.

When you're through, click **OK** to execute the subsetting logic based on your specifications. Multiple criteria are ANDed between tabs: the subset will include each PDU/cell that matches all the General Subset Criteria *and* that has one of the IP address(es) specified, *and* that has any of the decodes specified.

After you create the subset, the title above the main PDU/cell list changes accordingly, and indicates the current subset level: 1 the first time you create a subset, 2 when you created the first nested subset, and so forth. You can save the subset, as necessary, assigning it a new capture filename (**Save As** command).



The PDU/cell Count field changes to reflect only the traffic in the subset.

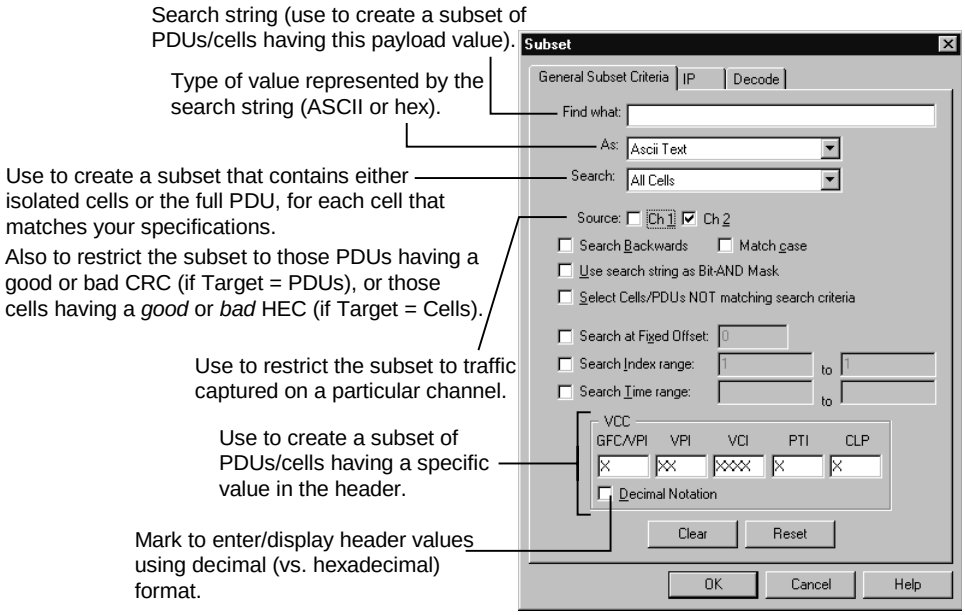
Note: If you create a subset of cells (vs. PDUs), 622Vu Advisor can't guarantee the integrity of the containing PDUs, because one or more cells may be missing. The system warns that you won't be able to decode the PDU-level information (right). Click **OK** to proceed.

Nesting Subsets

You can nest subsets by creating increasingly restrictive criteria, basing each subset on the results of the prior subset. 622Vu Advisor keeps track of the entire hierarchy of subsets, and lets you undo subsetting to any level. Choose **Undo Last Subset** from the **Edit** menu (or press <Ctrl-Z>) to revert to the next-higher-level subset. From a level-2 subset you can revert to a level-1 subset, for example, and from there to the original capture.

Using the General Subset Criteria Tab

The General Subset Criteria tab lets you describe the basic subset criteria:



Follow these steps to fill in the General Subset Criteria tab:

1. If you want to create a subset based on a value in the payload area:

   Specify the value you want in the Find What box.

   Use the As drop-down list to indicate whether you're looking for ASCII text or a hex value.

2. If you want to create a subset based on a value in the cell header, use the **VCC** area to specify the value you want. Header values can be entered/displayed in decimal or hexadecimal format. Mark the **Decimal Notation** box if you prefer decimal; otherwise leave it blank.

   If you specify *both* the Find What and VCC areas, the system creates a subset of cells/PDUs that have the search string within the payload of *only those cells* where the header fields match your VCC values.

3. Use the **Search** drop-down list to indicate whether to create a subset of all PDUs or cells; or to consider only those PDUs having a good or bad CRC, or only those cells having a good or bad HEC. Any of the PDU/CRC values request a search by PDU. The cell/HEC values request a cell-by-cell search of the capture file. 622Vu Advisor only displays those options that are appropriate to the level of detail shown in the main display (PDU or cell).

4. In the **Source** area, indicate whether to consider traffic captured on Channel 1, Channel 2, or both.

5. Mark **Search Backwards** to begin searching for cells/PDUs to include in the subset at the end of the capture file; otherwise (with this box unmarked) the system starts at the beginning of the file.

6. If you're searching for an ASCII value, indicate whether to **Match Case** or not. Leave this box blank for a non-case-sensitive search.

7. If you want to treat the Find What and/or VCC values as a bit-match pattern, mark the **Use Search String as Bit-AND Mask** box. With this box marked, 622Vu Advisor interprets the Find What and/or VCC values as a bit-match pattern, returning all cells/PDUs that match any of the ON bits in the mask. For example, if you specify a hex 03 (binary 0000 0011) in the search string, fixed at offset 15, 622Vu Advisor looks for traffic whose payload has either of the low-order two bits set.

8. Optionally, mark the **Select Cells/PDUs NOT Matching Search Criteria** box to toggle between selecting values that *match* or *don't match* the other specifications. With this box marked, the select/reject decision that's made by taking all the other criteria into account is reversed at the very end of the decision-making process; any cells or PDUs that would normally be rejected from the subset are accepted, and any cells/PDUs that would normally be accepted are rejected.

9. The **Search at Fixed Offset** field applies if you're searching for a string in the payload. It allows you to specify an offset from the beginning of the payload where you want to begin the search. Valid offsets are in the range 1–48 for a cell-by-cell search; 1–65,535 for a PDU search. If you leave this field blank, 622Vu Advisor searches the entire payload.

10. The **Search Index Range** field lets you limit the search to a particular range of cells or PDUs, identified by the number displayed to the left of each cell/PDU in the capture-file display. Specify a starting (i.e., low) and/or an ending (i.e., high) number to identify the range you want to search. These default, respectively, to the first and last cells in the capture file.

11. The **Search Time Range** field lets you limit the search to cells/PDUs captured during a specific time period. Specify the *from* (left) and *to* (right) times using an *hour*:*minute*:*second* format, with an optional 9 decimal positions to the right of the seconds field: *hh*:*mm*:*ss*.*nnnnnnnnn*

Use the **Clear** and **Reset** buttons at the bottom of the form to set all values to their default settings, or to redisplay the last saved set of values, respectively. (The **OK** button saves values.)

Using the IP Tab During Subset Processing

Use the IP tab (illustrated on page 86) tab to include only those cells/PDUs having specific IP addresses. You can specify source and/or destination addresses, or combinations of source/destination addresses. By default, the subset includes *any* (i.e., all) IP addresses.

1. Click **Add** to add an IP address (or pair of IP addresses) to the list. 622Vu Advisor opens a dialog box that lets you specify a source and/or destination address, as well as the direction of traffic flow (bi-directional or source-to-destination).

   You must specify each address explicitly, but you can select "any" or "****" from either list, to request a match to any IP address for that field (e.g., to match a specific source address to any destination address, or any source address to a specific destination address). Click **OK** when you're through to add the address(es) to the IP list. The arrows under the Flow column indicate the selected direction of flow.

2. To change an address (or pair of addresses), first select the address(es) from the list, then click **Edit**. 622Vu Advisor prompts for the changes using a window similar to the one described above for an add.

3. As necessary, select an address (or pair of addresses), then click **Remove** to delete it from the IP list.

When you're through with the IP tab, click **OK** to save your settings.

Using the Decode Tab During Subset Processing

Use the Decode tab (illustrated on page 87) to include only those cells/PDUs that use a certain type of decode. By default, the subset includes *all* decodes.

1. Click **Add** to add a specific type of decode to the list. 622Vu Advisor opens a dialog box that lets you enter a decode directly, or select one from the drop-down list. Click **OK** when you're through, to add the decode to the list.

   If you specify a type of decode that isn't in the drop-down list, 622Vu Advisor accepts (and uses) it as entered. 622Vu Advisor does *not* try to verify user-specified values.

2. Click **All** to add all the decodes available in the drop-down list.

3. As necessary, select a type of decode and click **Remove** to delete it from the list.

When you're through with the Decode tab, click **OK** to save your settings.

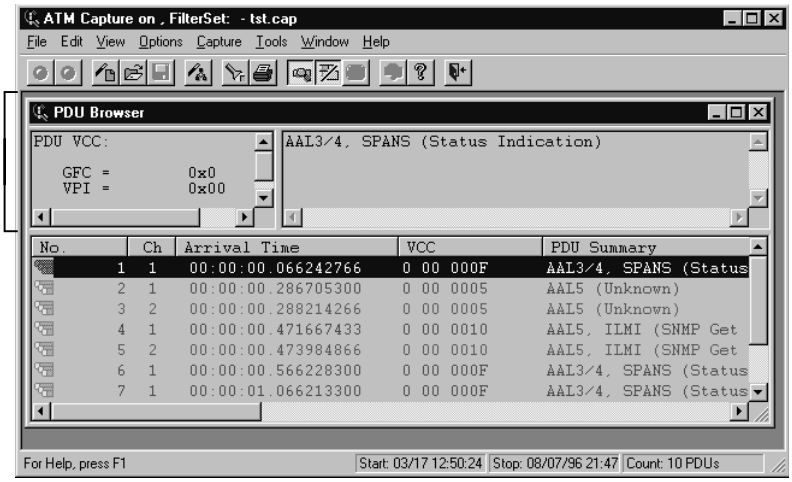
Requesting More Detail For a PDU or Cell


Detail Display

You can toggle display of a more detailed view using the **Detail Display** button. When you toggle the detail on, a panel opens above the cell/PDU list that contains detailed information about the cell or PDU that's selected currently:

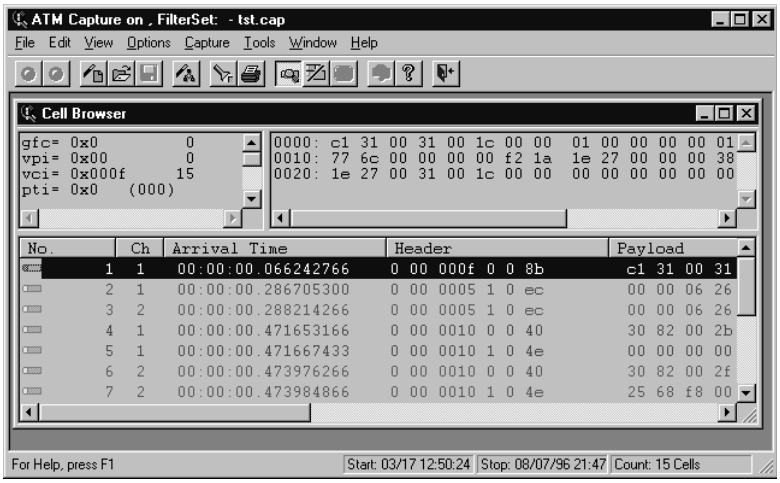
- **For a PDU-level display**, the detailed information includes a brief PDU summary (left) and full PDU summary (right):

Detail for the selected PDU: brief PDU summary (left) and full summary (right).



- **For a cell-level display**, the detailed information includes a decode of the cell's header (left) and the ASCII translation of the cell's payload (right). The payload translation includes 16 bytes/line, with hex values to the left and an ASCII translation to the far right (off the display in this example).

Detail for the selected cell: header information (left) and payload data (right).



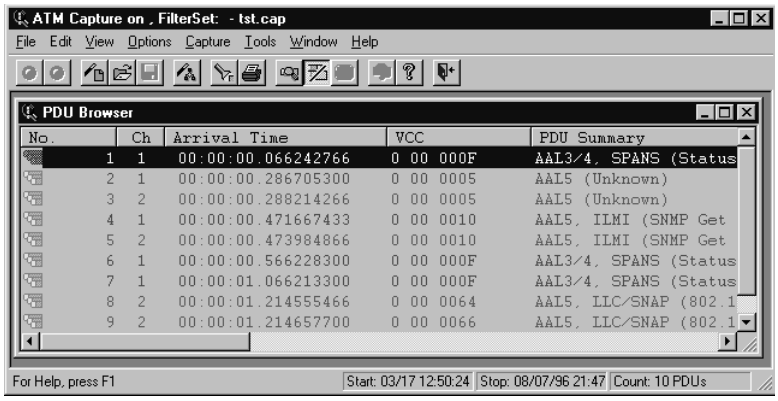
Switching Between a PDU and Cell-Level Display


PDU Summary Mode

The **PDU Summary Mode** button lets you toggle between a display of individual cells, and one that condenses each PDU to a single line. Click the **PDU Summary Mode** button as many times as you want, to toggle between a display of PDU-level information and individual cells.

The title of the browser window changes to reflect the current setting (PDU Browser vs. Cell Browser). The window on page 89 shows a cell-level display. A PDU-level display looks like this:

This is a PDU-level display. →



As appropriate with the PDU-level display, you'll see protocol-specific information in the PDU summary line, such as the LAN protocol (IP, IPX, etc.) source and destination address. You can specify preferences for use in decoding PDUs, through your user profile definition; specifically, you can indicate particular VCCs that should be decoded in a certain way. See *Specifying Decode Preferences* starting on page 100 for more information.

When you exit from 622Vu Advisor, the system remembers the current PDU summary-mode setting. It stores the setting in the user profile, then initiates the next capture display using the same setting.

Creating a Script From a Capture File

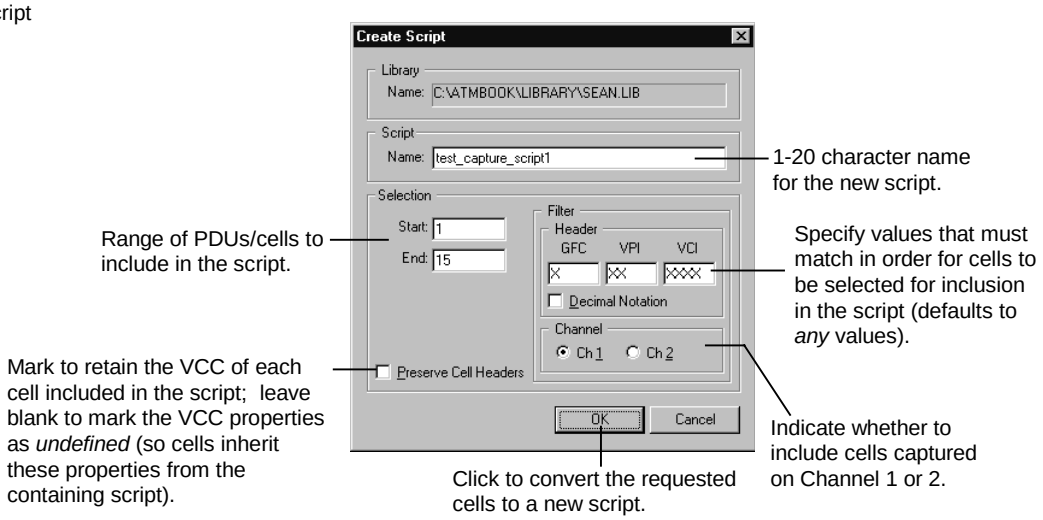
You can create a script from any previously stored capture file, or from a subset of any previously stored capture file. In either case, 622Vu Advisor combines a series of sequences to form the script, preserving the timing and delays from the original cell transmission.

Note: If you want to edit any of the cells or the script itself, use 622Vu Advisor's script editor to view the script (including a list of sequences defined within the script), then use the sequence editor to make any cell- or sequence-level modifications. Refer to page 177 for

information about browsing and editing a script, and to Chapter **9** for details about sequence processing.

Create Script

Click the **Create Script** button to build a script from a capture file. 622Vu Advisor opens a dialog box used to define the details of the script:



Follow these steps to create the script:

1. Fill in the script **name** (1–20 characters).

2. Specify the range of PDUs or cells to include in the script. The **Start** and **End** values you specify correspond to the numbers in the left-most column of the main display (labeled No.).

3. Mark the **Preserve Cell Headers** check box to retain the VPI/VCI for all captured cells. Leave it blank to mark the VPI/VCI properties as *undefined*, causing the cells to inherit these properties from the containing script (see Chapter **10**).

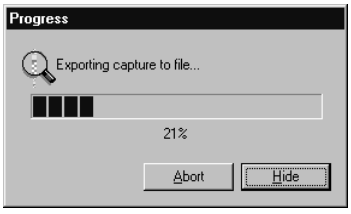
4. Optionally, use the **Header** area to limit the cells included in the script to those that match particular values in the GFC/VPI, VPI, and/or VCI header fields. (You might have performed this reduction in cells already, by creating a *subset* of the cells/PDUs you want.) 622Vu Advisor uses the values you enter as a filter, and only includes those cells that match the hex bits specified. An X instructs 622Vu Advisor to include cells having any value in the corresponding bit positions. By default, 622Vu Advisor ignores these fields (as indicated by Xs in the initial display), so accepts any value.

   Mark the **Decimal Notation** box to display and specify header values in decimal format. Leave it blank if you're using hexadecimal instead.

   The settings to the right request only those cells having a VCI value of ending in hex '10'.

5. Use the **Channel** area to indicate whether to include cells captured on Channel 1 or 2.

6. Click **OK** when you're through, to save the indicated range of cells as a script. 622Vu Advisor displays a progress bar at the bottom on the window as it creates the script, then issues a message telling you that the script is completed. (You can **Hide** the progress dialog box by clicking the Hide button, or stop the process altogether by clicking **Abort**.)



Chapter 7
Monitoring Real-Time Statistics

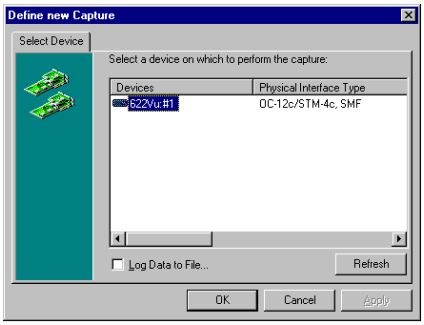
Any time you're not actively capturing traffic, 622Vu Advisor lets you monitor the traffic over the link attached to a particular analysis device. It displays statistics related to the traffic (in order as the traffic is received by the device), breaking down the information by VCC.

622Vu Advisor tracks all traffic on the attached link on a real-time basis. At your request, 622Vu Advisor displays the active network connections on the link, providing statistics in a tabular fashion so you can track bandwidth use (and error counts) easily. It also offers a graphing capability, so you can lay out the statistics in graphical form.


Real-Time Statistics

Click the toolbar's **Real-Time Statistics** button to initiate real-time statistics processing (or choose **Real-Time Statistics** from the **Activities** menu).

622Vu Advisor displays the 622Vu undercradle. Select that device.



You'll only see the 622Vu undercradle that is currently available for use. If a specific device is already performing RAM-intensive activity (such as a capture), it won't appear in the list. If you expect to see a device that isn't here, click the **Refresh** button to reevaluate its status.

If you want to write a copy of the statistics to an external (.csv-format) file, mark the **Log Data To File** box. This opens a standard file-open dialog box that you'll use to navigate to the log file you want.

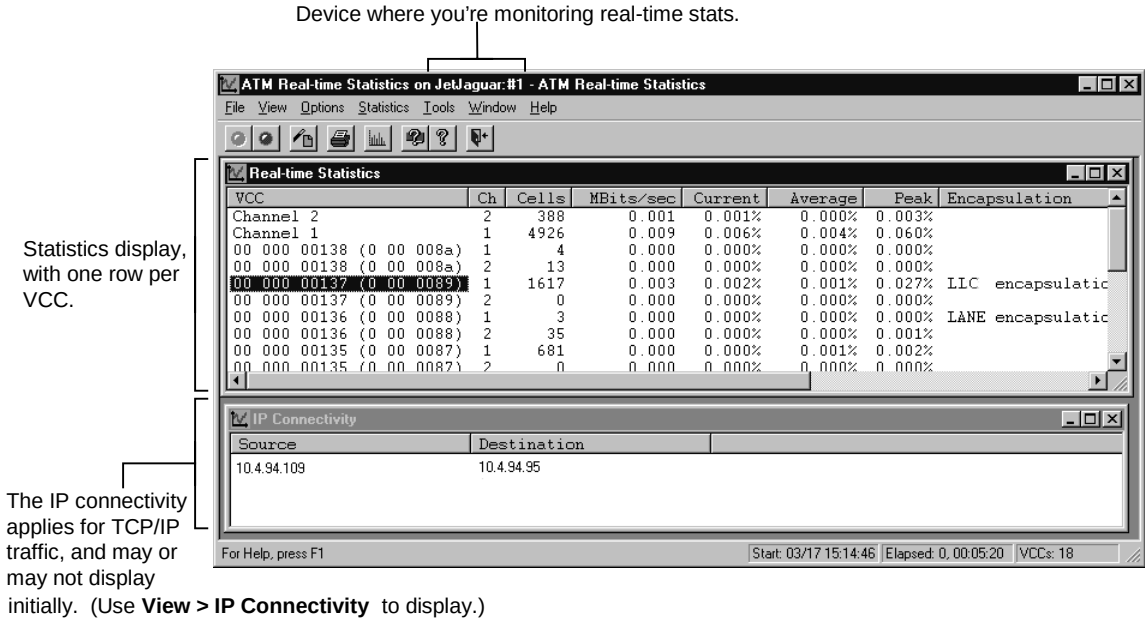
Click **OK** when you're through.

Overview of the Display

622Vu Advisor opens a display of statistics for traffic on the link attached to the selected analysis device:

In the real-time statistics display, each line corresponds to a different VCC, with a total by channel. In the status bar (bottom of window), the Start and Elapsed

times indicate the date and time the statistics were started, and the amount of time the statistics have been accumulating. The VCC field indicates the number of different VCCs for which statistics are displayed.



The statistics run until you click **Stop**  , at which point all statistics stop incrementing and any graphing functions cease. After you stop the statistics, the **Start** button becomes active (turns green), allowing you to restart a new set of statistics for the same analysis device. (You can't append to the previous set of statistics with a restart.)

You can control the statistics displayed (including whether you see Mbps or Cells/sec data), through use of the **Columns** command. If you notice a problem with a particular VCC, you can begin capturing traffic over that VCC, first defining a filter that's specific to the data you want.

As desired, you can graph the Mbps (or Cells/sec) statistic for one or more VCCs.

If you're tracking a channel that's carrying TCP/IP traffic, you can monitor the source and destination addresses for that traffic. Use the **IP Connectivity** command from the **View** menu to do this. (The real-time statistics display may start up with the IP Connectivity window opened already, in which case this isn't necessary.)

The rest of this chapter describes these features further, and is broken down as follows:

- ***Section 7.1 Real-Time Statistics For Each VCC*** (page 120) describes each available statistic, and the use of the Columns feature to control the information displayed.
- ***Section 7.2 Menu Commands & Toolbar Buttons*** (page 121) describes the menu options and toolbar buttons.
- ***Section 7.3 Graphing Real-Time Statistics*** (page 124) tells how to graph statistics for one or more VCCs,
- ***Section 7.4 Creating A FilterSet That Captures Specific VCCs*** (page 127) tells how to create a filterset based on specific VCCs that show up in the display, and optionally how to initiate a capture using that filterset.

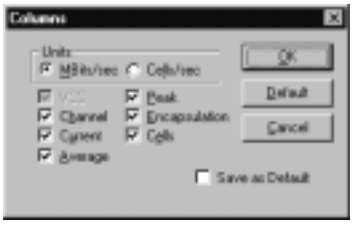
7.1 Real-Time Statistics For Each VCC

The following real-time statistics are available. You can display any or all of these statistics, as necessary. See ***Requesting Statistics via the Columns*** (page 84) for related instructions.

Table 6. Available Real-Time Statistics

Column	Description of Content
VCC	Number to identify a particular VCC. Each time 622Vu Advisor detects a new connection on a channel (1 or 2), it displays the corresponding VP/VC identifiers and begins tracking statistics for that connection.
Ch	Channel on which the VCC was detected.
Cells	Number of cells encountered that match the VCC.
Cells/sec	Number of cells that are *currently* being transported per second over the VCC. You can select either this field or the Mbps field using the **Columns** command, but not both. You can graph this statistic, using the **Real-Time Graph** facility described on page 124.
Mbps	Number of Megabits per second used *currently* to transport cells over the VCC. You can graph this statistic using the **Real-Time Graph** facility (page 124).
Current	Percent of the total bandwidth used *currently* to transport cells for this VCC.
Average	Same as Current, but specifies the *average* (vs. current) line utilization for the duration of the session.
Peak	Same as Current, but specifies the *maximum* line utilization at any point during the session so far (to transport cells for this VCC).
Encapsulation	Type of IP encapsulation available on the connection (blank if the analysis device has not been able to identify the type of encapsulation): IP over AAL5, according to RFC 1577 LC encapsulation according to RFC 1483 LANE encapsulation If you click on a row that shows encapsulation, 622Vu Advisor opens a window showing the source and destination address(es) for the connection.

Controlling Which Statistics (i.e., Columns) Display



You can control which real-time statistics display, by choosing the **Columns** command from the **Options** menu. Mark each statistic you want to see, then click **OK**. Use the top-most area (Units) to indicate whether you want to view the Mbps or Cells/sec data. (You can only view one or the other at any point in time.)

If you want to save the currently selected set of statistics as the *default*, mark the **Save as Default** box. 622Vu Advisor will display the same information in all subsequent real-time statistics displays until you change it, and will reset the same set of statistics when you click the **Default** button (below).

The **Default** button sets all statistics to the last default settings (defaults to all statistics ON including Mbps at installation).

Note: Instead of using the Columns command to open this dialog box, you can click the right mouse button from the main statistics display.

7.2 Menu Commands & Toolbar Buttons

Table 7 describes each command and toolbar button available for use during real-time statistics processing.

Table 7. Real-Time Statistics Menu Commands and Toolbar Buttons

Menu Command	Toolbar Equivalent	Used to…	See Page
File			
New		Initiate the collection of real-time statistics on a particular device.	—
Print		Print the current window on your default printer.	—
Print Preview	—	Display a preview of what would print via the **Print** command. 622Vu Advisor opens a window that lets you scroll through the document, zoom in and out, and print, as necessary.	
Print Setup	—	Open your standard print-setup dialog box.	—

Menu Command	Toolbar Equivalent	Used to…	See Page
Exit		Close the Real-Time Statistics application.	—
View			
IP Connectivity	—	Display the IP Connectivity window, used when there is TCP/IP traffic on a particular VCC to track the source and destination addresses for that traffic.	118
Real-Time Graph		Initiate graphing of either the Mbps or Cells/sec statistic on one or more VCCs. Specifically, this command opens a dialog box through which you can define the properties of the graph you want.	124
Toolbar	—	Toggle display of the toolbar.	—
Status Bar	—	Toggle display of the status bar (bottom of window).	—
Options	—		
Font		Not used.	—
Default Font	—	Not used.	—
Columns	—	Open a dialog box used to control the statistics displayed. This command is an alternative to clicking the right mouse button from the main statistics display.	121
Graph Settings	—	Change the properties of a graph. This command is an alternative to clicking the right mouse button from a graph window.	125
Logging	—	Open a log file, then begin writing the statistics to that (.csv-format) file. Same as clicking **Log Data To File** in the initial window (page 117).	—
Statistics			
Start		Reinitialize all real-time statistics and restart the monitoring process using the current set of specifications; applicable after stopping the statistics. (You can't continue a stopped set of statistics to append additional information.) This command does *not* restart any graphs that were running previously; you must redefine and restart those graphs individually. To restart the graphs, choose **Graph Settings** (from the **Options** menu) from each graph window.	118
Stop		Terminate the actively running statistics and any active graphs. After you press **Stop**, the **Start** button becomes active (turns green), allowing you to restart the statistics.	118
Tools			
Create Filter	—	Define a capture filterset on the fly, and optionally initiate a capture using the filter. The filterset is based on VCC values. This feature is useful if you see one or more "problem" VCCs while monitoring real-time statistics, and want to capture the traffic on those VCCs.	127

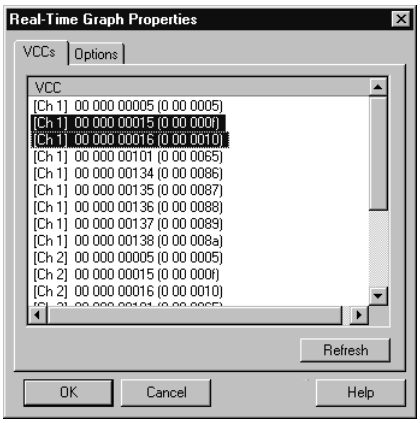
Menu Command	Toolbar Equivalent	Used to…	See Page
Describe Device		Display information about the analysis device where you're collecting real-time statistics (applicable only when statistics are running): device identification, network information, hardware specifications, and available memory.	—
Window			
Cascade	—	Cascade all open windows.	—
Tile Horizontally	—	Arrange all open windows horizontally, so you can see them together.	—
Tile Vertically	—	Arrange all open windows vertically, so you can see them together.	—
Arrange Icons	—	Align icons for all minimized windows across the bottom of your monitor display.	—
Help	—	Display online Help and/or general information about the ATM Capture utility, which includes real-time statistics.	—

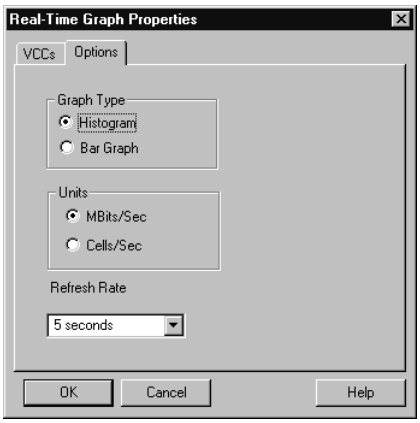
7.3 Graphing Real-Time Statistics

622Vu Advisor lets you graph the Mbps and/or Cells/sec field while monitoring real-time statistics. You can open any number of graphs. For each graph, you can choose one statistic or the other, and you can select the format you want (line or bar graph).


Real-Time Graph

Click the **Real-Time Graph** button to start a new graph. 622Vu Advisor uses these two panels to prompt for the new graph properties:



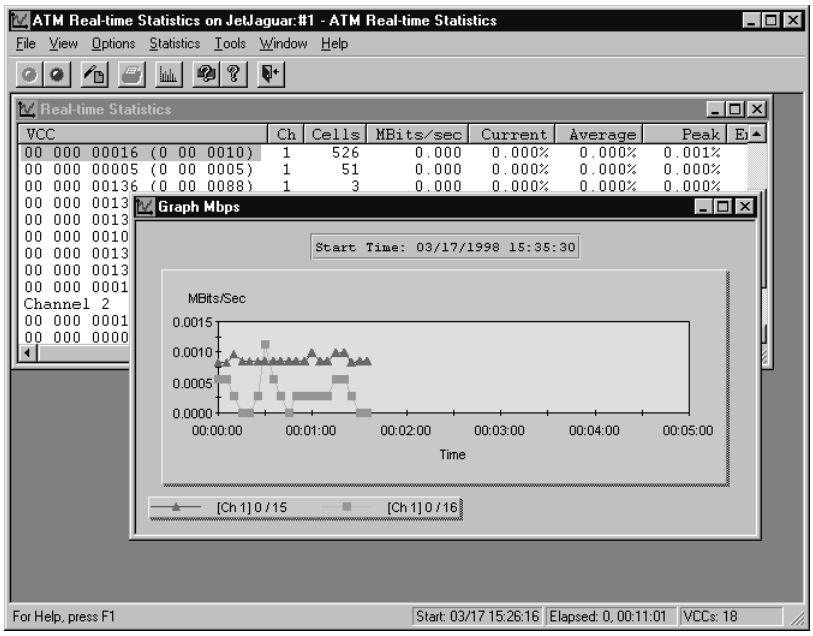


From this display:

- Use the **VCCs** tab to specify which VCC(s) you want to graph. You can select one or more VCCs; 622Vu Advisor graphs each one separately. Hold down the <CTRL> key to select multiple VCCs. Do *not* click **OK** until you've also assigned the Options you want.
- Use the **Options** tab to indicate what **Graph Type** you want, choosing either a histogram (line) or bar graph format. Next identify the **Units** you want to chart: either Mbps or Cells/second. Finally, indicate the **Refresh Rate**: the rate at which 622Vu Advisor updates the graph. Select the rate you want from the drop-down list.

  Note: Do *not* click **OK** until you've also assigned the VCCs you want.

Press **OK** when you're through to open the new graph:

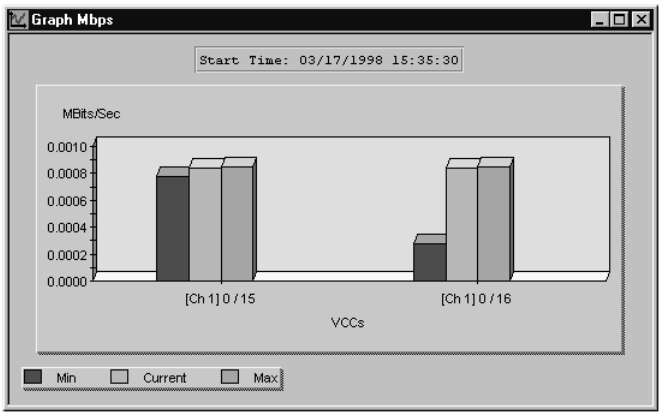


In this window:

- The X-axis tracks the time elapsed, marked at five-minute intervals. When you reach the limit of the time displayed, 622Vu Advisor shifts the graph to allow for additional data to the right. (Be careful if you stop real-time statistics then start them again, and restart a graph whose X-axis has shifted. You won't actually see the new data until the statistics have run for the earliest elapsed-time indicated along that axis. To show the data from the beginning, close the graph window before restarting the graph.)

- The Y-axis tracks the data (either Mbps or Cells/second) by VCC, and shows values consistent with the physical interface supported by the analysis device (OC-12c/STM-4c). Each VCC uses a different symbol, so you can distinguish between them easily. (Refer to the bottom of the graph for a key of symbols used to identify each VCC.)

As necessary, you can click the right mouse button to change the properties of the graph, or choose **Graph Settings** from the **Options** menu. This opens the same window described above, allowing you to change the VCC(s) and graphing options. Each time you change the specifics, 622Vu Advisor restarts the graph. Here's the same information shown in bar-graph format:

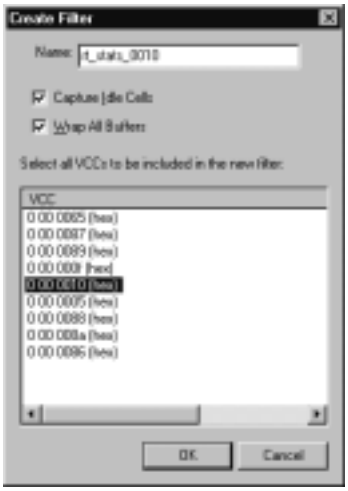


622Vu Advisor continues to update the graph until you **Stop** the session (or close the graphing window). If you restart the real-time statistics, make sure to start the graph again if desired.

7.4 Creating A FilterSet That Captures Specific VCCs

While you're monitoring real-time statistics, you may notice one or more VCCs that require closer analysis. In this case, you can define a filterset from the real-time statistics window that includes only those VCCs, then initiate a new capture using the filterset. (Alternatively, you can save the filterset for later use.)

Choose **Create Filter** from the **Tools** menu to define the new filter. Then:



- Specify a name for the filterset in the **Name** field.
- Mark **Capture Idle Cells** to capture idle cells (in addition to those for the VCC(s) specified). This is useful, for example to determine how much of the bandwidth is used for idle-cell traffic. If you mark this box, 622Vu Advisor defines a buffer in the filterset that's dedicated to storing idle cells.

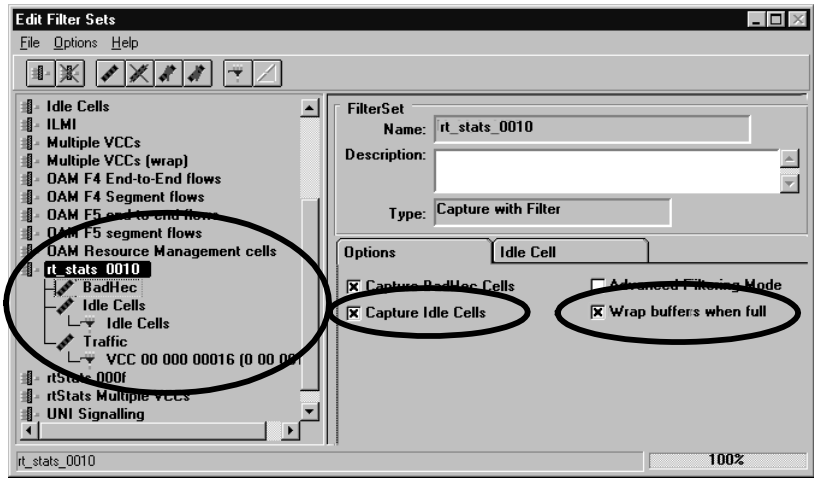
  By default, a cell is considered idle if it has zeros in every bit position of the first five header fields. If you want to capture idle cells but change the definition of an idle cell, first save the filterset by clicking **OK**, then edit it using 622Vu Advisor's standard filterset editor, detailed in Chapter **8**.
- Mark **Wrap All Buffers** if you want to wrap each buffer when it's full, reusing each buffer continually until the capture is stopped. See page 140 for more information about wrapping buffers.
- In the **VCC** area, select each VCC you want to capture when you use the new filterset.

Click **OK** when you're through. 622Vu Advisor asks if you want to launch the new capture immediately (which will automatically stop any active real-time statistics processing). Click **Yes** to start a new capture using the filterset you just defined; **No** to not start the capture and to save the filterset for future use.

Saving the Filter

622Vu Advisor automatically saves each filter you define, assigning it the name you specified above. It defines a buffer for cells having a bad HEC, a buffer for idle cells (as appropriate to your specifications), and a buffer (called **Traffic**) to store the selected VCCs. It allocates the available buffer space automatically as follows: 10% for the BadHec buffer (if specified), and the rest split evenly between the idle-cell and traffic buffers.

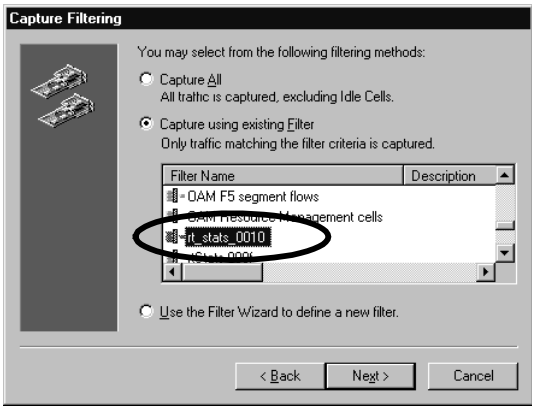
You can examine the filterset using 622Vu Advisor's standard filterset editor (detailed in Chapter **8**), and you can use the filterset editor to change the standard features of the definition. For example, to control the capture of idle cells, or cells having a bad HEC; or to override the automatic buffer sizing available here. If you view the sample filterset shown above through the normal filter processing window, this is how it would look:



The circled components correspond to the specifications entered explicitly during the original filter definition. Cells having a bad HEC are always captured, by default (as indicated by the first check box in the Options panel).

Using the Saved Filter

The filtersets you create from the Real-Time Statistics window are available whenever you start a new capture (or real-time stats session), from this window of the wizard (right):

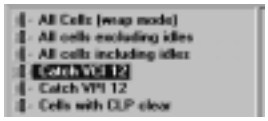


Chapter 8
Filtering Captures

When you capture incoming traffic, the capture files get large very quickly if you keep every cell. Because of this, 622Vu Advisor lets you set up filters that identify the characteristics of the cells you want to keep. When you initiate a capture (see page 77), 622Vu Advisor lets you specify a filter to use to control the content of the capture file. The filter you specify operates in real time during the capture, at full bandwidth and at the hardware level.[1]

You can define filtersets from three places: using 622Vu Advisor's standard filterset processing (described in this chapter), during capture processing (described in Chapter **6**), or while monitoring real-time statistics (described in Chapter 7).

8.1 Understanding Filters



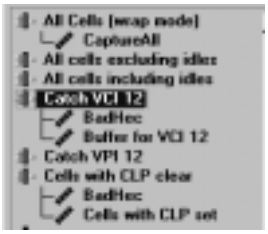
Filters are defined in terms of ***filtersets***. Each capture can use, at most, one and only one filterset. The image to the right shows six filtersets. At the highest level, each filterset is defined as either capturing *everything* (i.e., all traffic), or as using *filter entries*. The specifics of the filterset definition vary depending on the type of filterset (*everything* or *use filter entries*).

Each filterset divides the memory available for capturing cells into receive areas (called ***filter buffers***), and specifies what type(s) of cells should go into each area:

- For filtersets that are defined as capturing *everything*, there's only one buffer, called CaptureAll.

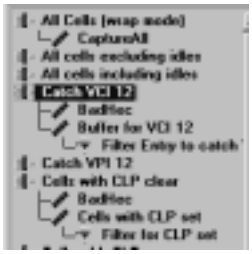
1 This contrasts with the subset facility described in Chapter **6**, which lets you reduce the cells in a capture after the full capture has taken place. The filtering capability provides a more efficient way to limit the content of the capture, for those situations where you'll never need the cells being eliminated.

- For filtersets defined as using filter entries, there's always a buffer called BadHec, which stores cells detected as having a bad HEC; and there can be up to three additional buffers.



In our example, the filterset *All Cells* has one buffer, and *Catch VCI 12* and *Cells with CLP clear* have two buffers each:

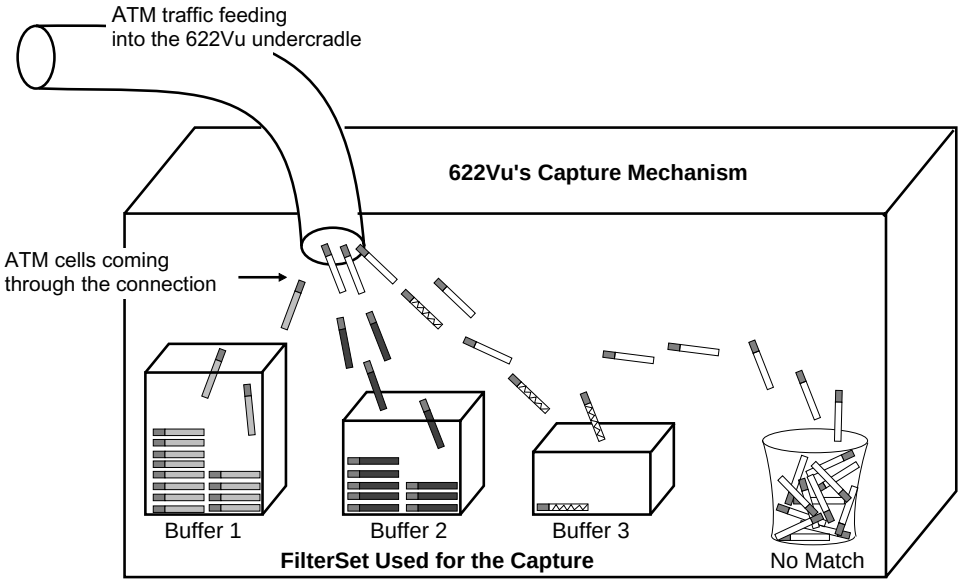
- The CaptureAll buffer stores all cells for the first filterset (*All Cells*).
- The BadHec buffers store cells having a bad HEC for each of the other two filtersets.
- The other two buffers store cells defined as having specific values (respectively, in the VCI and CLP fields).



For any buffers you define, there is one or more ***filter entry*** within that buffer. Filter entries tell 622Vu Advisor exactly what types of cells you're looking for. There's one filter entry for each different type of cell you want to capture in the buffer. In the example to the right, the two buffers designed to store cells having a specific value have one filter entry each.

The standard BadHec and CaptureAll buffers don't allow filter entries, although you can change their buffer-level settings (to restrict the size of the buffer, for example, or to control whether the buffer wraps when it's full).

During capture processing, 622Vu Advisor checks each incoming cell against the filter entries, looking at those entries in order as they're defined within the filterset. It keeps each cell that matches the criteria specified by any filter entry, storing that cell in the buffer corresponding to the first filter entry it matches. 622Vu Advisor discards cells that don't match the criteria for any of the buffers. This is illustrated here for a filterset having three buffers:



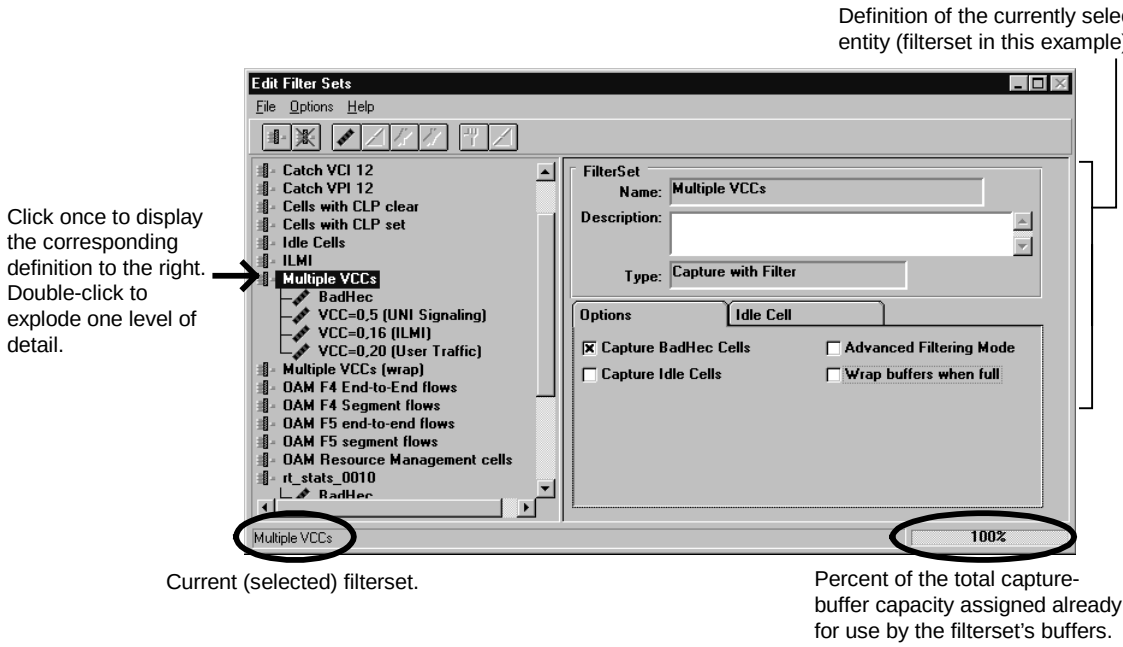
If a cell matches the criteria for a particular filter entry but the corresponding buffer is full (and doesn't wrap), then that cell is dropped; it won't fall through to another buffer, even if it matches a filter entry in that buffer.

Note: The assignment of buffers through filtering has no effect on the capture display. All the cells stored in the various buffers are combined and sorted (by arrival time) before being displayed.

8.2 Looking at Filter Definitions

Capture Filters

Click the **Capture Filters** button on the toolbar to display a list of filtersets defined in the active cell library (or choose **Capture Filters** from the **Activities** menu). Initially, the lefthand side of this window only shows the filtersets (no buffers or filter entries). Click on any filterset to display its definition:



You can explode any filterset to see its buffer definitions, then any buffer to see its filter entries. Double-click on a line to explode its detail.

Use the window above to define and modify your filtersets, using the pulldown menus to direct your processing (see Table 8 on page 136). As an alternative, use the toolbars to choose the processing you want. The toolbars include buttons for the most commonly used commands.

The menu options available to you vary as you click on the different levels of definitions down the lefthand side of the window, as do the available toolbar buttons across the top. In Table 8, the Level Used At column indicates which options are available for filtersets (FS), filter buffers (Buf), and filter entries (Ent).

Follow the instructions in the rest of this chapter to define and modify filtersets. Use the right side of the window to enter and change specific information. The information displayed to the right varies, depending on whether you are

positioned on a filterset, filter buffer, or filter entry in the left-hand panel. Use the pulldown menus or toolbars to direct your processing. When you're through, choose the **Exit** command from the **File** menu.

The rest of this chapter is broken down as follows:

- ***Section 8.3 Defining FilterSets*** describes how to add, define, and delete filtersets at the highest level.
- ***Section 8.4 Defining Filter Buffers*** (page 143) describes how to add, define, and delete filter buffers, and how to adjust the sequence in which the buffers are examined during capture processing.
- ***Section 8.5 Defining Filter Entries*** (page 147) describes how to add, define, and remove specific capture criteria (i.e., filter entries) for a buffer.
- ***Section 8.6 Advanced Filtering Mode*** (page 149) describes the advanced filtering feature, which lets you define a filterset-level mask that's combined with all other selection criteria when choosing the cells to include. This lets you specify a particular characteristic that you want across all captured cells, for example, or header fields you want to ignore completely.

Table 8. FilterSet Pulldown Menus — Summary of Functions Available

Menu Command	Toolbar Equivalent	Level Used At: FS	Buf	Ent	Used to…	See Page
File						
New FilterSet		√	√	√	Define a new filterset.	137
Remove FilterSet		√	√	√	Delete the selected filterset, including all its component buffers and filter entries.	138
Clone FilterSet	—	√	√	√	Copy the currently selected filterset under a new name.	138
Save FilterSet	—				Not currently available.	—
New Buffer		√	√	√	Define a new buffer in the filterset.	144
Remove Buffer			√	√	Delete the selected buffer.	144
Clone Buffer	—		√	√	Copy the selected buffer under a new name.	144
Move Buffer Up			√		Move the selected buffer up one position (within the same filterset).	146
Move Buffer Down			√		Move the selected buffer down one position (within the same filterset).	146
New Filter Entry			√	√	Define a new filter entry in the selected buffer.	147
Remove Filter Entry				√	Delete the selected filter entry.	147
Clone Filter Entry	—			√	Copy the selected filter entry under a new name.	147
Exit	—	√	√	√	Exit from filter processing.	135
Options						
Show Header Values in Decimal Format	—	√	√	√	Request decimal (vs. hexadecimal) format for all header values. With this option selected, you'll enter and view header fields in decimal format. With this option unselected, you'll enter and view header data in hex format.	141, 143, & 148
Help	—				Obtain Windows Help on filtering.	—

* FS = option available for filtersets.
Buf = option available for buffers.
Ent = option available for filter entries.

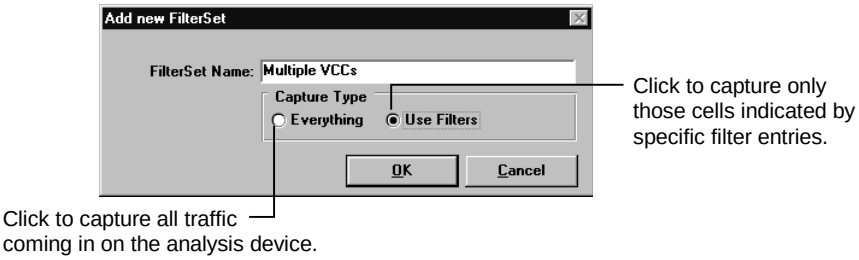
8.3 Defining FilterSets

Use the FilterSet commands from the **File** menu to add a new filterset (either from scratch or by cloning a filterset that exists already then changing it), to remove a filterset, or to modify a filterset's definition.

Adding a New FilterSet


Add FilterSet

To add a new filterset, click the toolbar's **Add FilterSet** button (or choose **New FilterSet** from the **File** menu). The system prompts for the name of the new filterset, and asks whether the filterset should be configured to capture *all* traffic coming into the analysis device or only selected traffic (based on filter entry definitions):



Fill in the name and select the appropriate radio button:

- If you select **Everything**, the filterset comprises only one buffer, by definition called CaptureAll. You can control the size and wrapping of this buffer, and whether it captures idle cells or not.

  This is the recommended way to capture all incoming traffic, if you're using a single wrapped buffer.

- If you select **Use Filters**, the system sets up one buffer (BadHec) to store any cells having a bad HEC. You can establish up to three other buffers, each with its own definition of content. You can define how much memory to use for each buffer, and whether to wrap buffer space. You can also indicate whether or not to capture idle cells.

When you're through, click **OK**. This adds a new (blank) definition. Proceed to *Modifying a FilterSet Definition* (page 139) for instructions to define the filterset, then to *Section 8.4 Defining Filter Buffers* (page 143) for instructions to set up the buffers for the filterset.

Cloning a FilterSet

Instead of adding a new filterset from scratch, you can copy an existing filterset then modify it. To do this, first select anywhere in the filterset you want to copy, then choose **Clone FilterSet** from the **File** menu. The system prompts for a filterset name for the copy, using a window similar to the one shown above for **Add** processing. Fill in the name you want, then click **OK**. 622Vu Advisor makes a complete copy of the filterset, including all buffers and filter entries (with their original names and definitions). Then it stores the copy under the new filterset name, placing it directly under the copied filterset.

You can change the definition as necessary, referring to the appropriate sections of this chapter.

Removing a FilterSet


Remove FilterSet

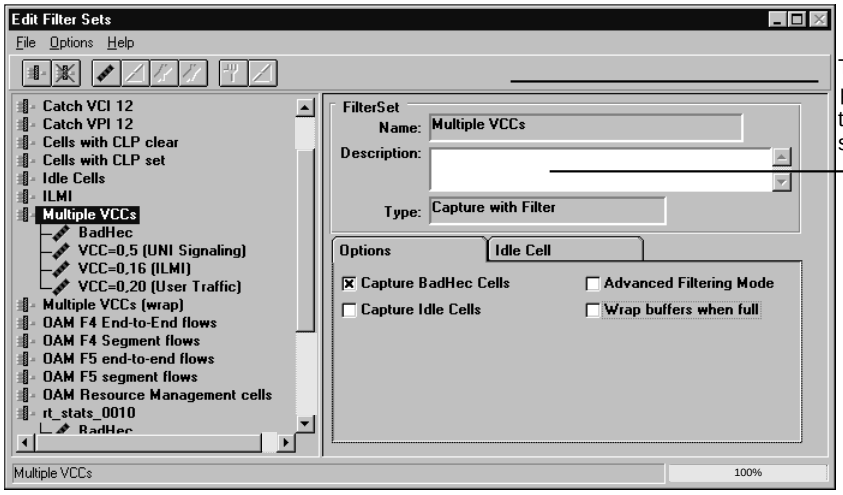
If you find you no longer need a particular filterset, you can remove it from the cell library. To do this, first select any component of the filterset definition, then click the **Remove FilterSet** button (or choose **Remove FilterSet** from the **File** menu).

The system verifies that you really want to remove the entire filterset, then deletes it from the library — including all component buffers and filter entries.

Note: Regardless of the level of definition selected when you request the delete, 622Vu Advisor removes the entire filterset, not just the selected component (e.g., buffer or filter entry).

Modifying a FilterSet Definition

The filterset definition window looks like this:



The filterset name and type were defined when you first added the definition, and can't be changed. Follow the directions below to specify the description, the options you want to use, and the idle-cell definition.

FilterSet Description

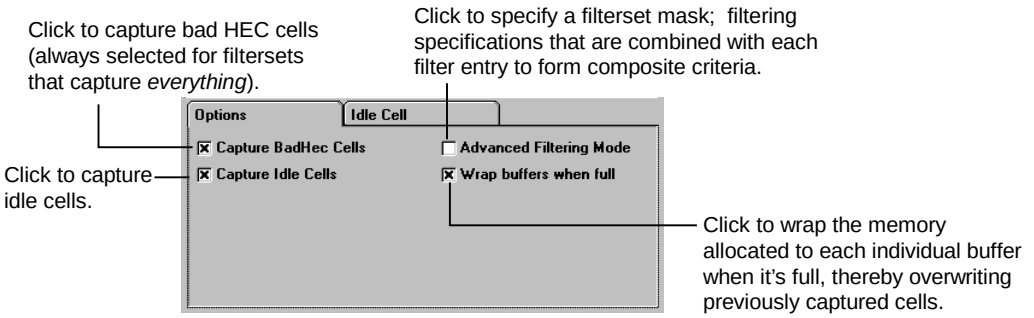
Specify the description as any text you want; typically something that explains the overall purpose of the filterset. The descriptive text is only used in this window.

FilterSet Options

Click the Options panel to make it active. Use the two check boxes at the top lefthand side, as appropriate, to indicate whether you want to capture cells having a bad HEC and/or idle cells.

- Cells having a bad HEC always go in the BadHec buffer, unless the filterset is set up to capture everything. (For *everything*-type filtersets they go into the standard CaptureAll buffer, along with all other traffic.)
- Idle cells go into a buffer that you set up explicitly, through filter entry definitions, to store idle cells. They're dropped if there's no such buffer.

Again, an exception occurs if the filterset is set up to capture *everything*, in which case idle cells go into the standard CaptureAll buffer.



Mark the Advanced Filtering Mode box if you want to extend the basic filtering capabilities of the system. (This feature isn't applicable for *everything*-type filtersets; i.e., CaptureAll buffers.) By default (without using advanced filtering), 622Vu Advisor lets you select cells based on bit settings in the first three header fields (GFC, VPI, and VCI). Collectively, these fields comprise the cell's address (path). With advanced filtering in effect, you can also select based on the remaining header fields (PTI, CLP, and HEC) as well as the first byte of the cell's payload.

If you mark this box, refer to *Section 8.6 Advanced Filtering Mode* (page 149) for the specifics of using a filtering mask.

Note: The advanced filtering feature is very powerful, and can lead to unexpected results unless you're careful. For most users the standard filter-entry criteria provide all the power necessary.

The Wrap Buffers When Full option applies for all buffers defined for the filterset, and indicates whether to:

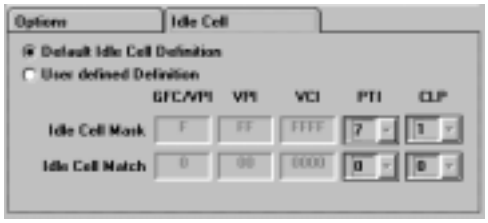
- Reuse each buffer continually until the capture is stopped, essentially creating a circular buffer (box is marked).
- Fill up each buffer once, then stop collecting the corresponding cells (box not marked). Cells that would otherwise be stored in the buffer are discarded; they don't fall through to any other buffers that match their content. When all buffers are full, the capture stops automatically.

If you wrap buffers, 622Vu Advisor writes over cells that have already been stored on the analysis device after the buffer is full. This is useful, for example, if you're tracking a particular problem(s) and aren't interested in saving the traffic until the problem occurs. In this situation, you can stop the capture immediately after the problem presents itself on the ATM device being tested, and the traffic passing through the analysis device at the time of the problem will

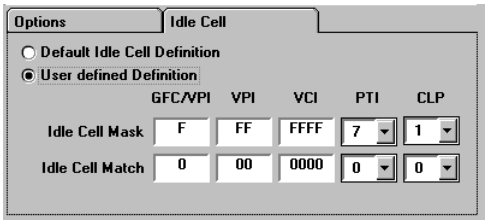
be in the active buffer (assuming the buffer is sufficiently large to accommodate any delay in human response time in stopping the capture).

Idle Cell Definition

Use the Idle Cell panel to define which cells should be considered *idle*, based on values in the first four bytes of the header. (Idle cells are either captured or skipped, depending on the Capture Idle Cells setting on the Options panel.)

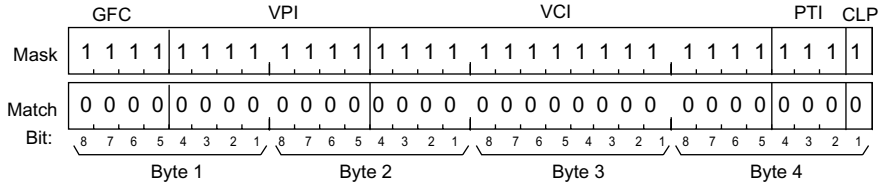


You can use 622Vu Advisor's default definition of an idle cell, as shown to the right (all zeros in the header); or you can identify the characteristics of an idle cell explicitly. In the latter case, 622Vu Advisor lets you specify any combination of specific bit values you want. The combination of these values will be recognized by the filtering mechanism (during capture processing) as an idle cell:



Notice the two parts of the idle-cell definition: the *mask* and the *match* settings. Both can be specified as either hexadecimal or decimal values that translate into specific bit-level settings for the first four bytes of the cell header. (Use either hexadecimal or decimal format to correspond to the current **Options** menu setting for **Show Header Values in Decimal Format**.)

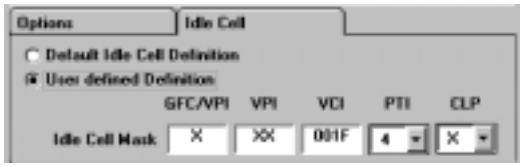
- The **Idle Cell Mask** indicates those bits you want to look at when searching for idle cells. By default, 622Vu Advisor looks at all the header bits, so each masking field contains a hexadecimal F (i.e., all 1s). The hexadecimal fields above translate to a bit string that looks like this:



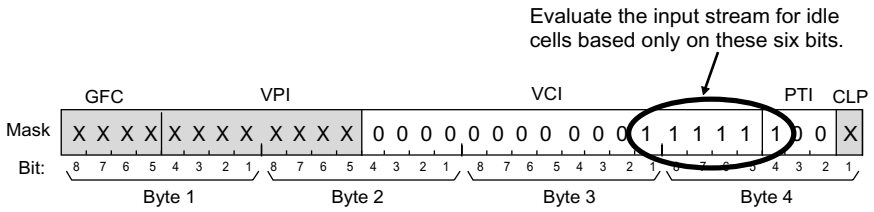
You can specify any bit position as follows. Use either hexadecimal or decimal values for the non-X settings, as appropriate to the current **Options** menu setting for **Show Header Values in Decimal Format**:

Bit (s) Setting	Tells 622Vu Advisor to…
0 (zero)	Ignore this bit position when trying to identify idle cells.
1	Examine this bit position when trying to identify idle cells. Consider the cell idle if all positions corresponding to 1s in the mask contain the values (0 or 1) specified in the same bit positions in the match specification.
X	Ignore all the bits in this field; they're not relevant to whether the cell is idle. If you use Xs in a field, the entire field must specify Xs.

Change the mask as necessary, to indicate those bit positions you want to match when determining whether the cell is idle (use 0 or 1 for each bit), and those that you want to ignore (use X).

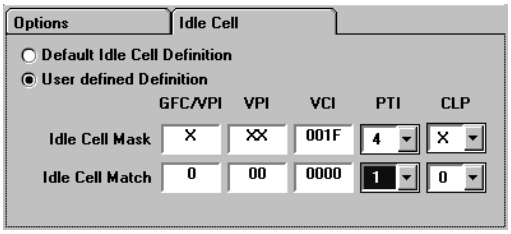


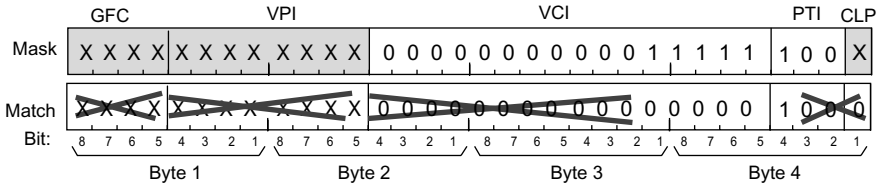
In the example shown to the right (and the bit mask below), we're asking 622Vu Advisor to explicitly ignore the GFC, VPI, and CLP when examining each cell to see if it's idle, as well as the first 11 positions of the VCI and last two bits of the PTI:



- The **Idle Cell Match** indicates the specific bit values that define a cell as idle. By default, a cell is considered idle if it has zeros in every bit position of the first five header fields. If you're using a mask, 622Vu Advisor only looks at the bit positions you've enabled (set to 1) via the mask, regardless of the match characters you specify. In our example, it would only make sense to specify the last five bits of the VCI, and the three bits in the PTI. Because the mask tells 622Vu Advisor to ignore the other positions, there's no point in specifying them here.

For purposes of illustration, assume we want to specify idle cells as those having zeros in the last five bits of the VCI, and a 1 in the first bit of the PTI. Our match settings look like this. (✕ indicates bits that are not examined):





Use either hexadecimal or decimal values to indicate the settings you want, to correspond to the current **Options** menu setting for **Show Header Values in Decimal Format**.

8.4 Defining Filter Buffers

As described previously, the filtering process uses 1–4 predefined buffers to store cell captures while you're monitoring incoming traffic (described in Chapter **6**). Each buffer is allocated a certain percentage of the total memory available (32 MB) on the analysis device for captures.

During capture processing, incoming cells are stored in the first buffer where a match is found between the cell and specific filtering criteria (established via the buffer's filter entries). A filterset option controls the action taken when a buffer's memory is exhausted (either wrap traffic back to the beginning or stop capturing, as described on page 140).

This section describes how to add a new filter buffer (either from scratch or by cloning a buffer that's defined already), to remove a buffer, to shift a buffer up or down within the filter definition, and to modify a buffer's definition. The definition specifies the amount of memory available for each buffer.

Two types of buffers, CaptureAll and BadHec, are reserved for use by the system (see page 131). You can modify the definitions of these buffers, but you can't delete them.

Adding a New Buffer


Add Buffer

To add a new filter buffer, click the toolbar's **Add Buffer** button (or choose **New Buffer** from the **File** menu). The system prompts for the name of the new buffer using the window shown to the right. Fill in the name and click **OK** to add a new (blank) definition. Proceed to *Modifying a Buffer Definition* (page 145) for instructions to define the buffer, then to *Section 8.5 Defining Filter Entries* (page 147) for instructions to establish the buffer's filter entries.

Cloning a Buffer

Instead of adding a new buffer from scratch, you can copy an existing buffer then modify it. To do this, first select anywhere in the buffer you want to copy, then choose **Clone Buffer** from the **File** menu. The system prompts for a buffer name to assign to the new copy, using a window similar to the one shown above for **Add** processing. Fill in the name you want and click **OK**. 622Vu Advisor makes a complete copy of the buffer, including all filter entries (with their original names and definitions). Then it stores the copy under the new buffer name, placing it directly under the copied buffer.

You can change the definition as necessary, referring to the appropriate sections of this chapter.

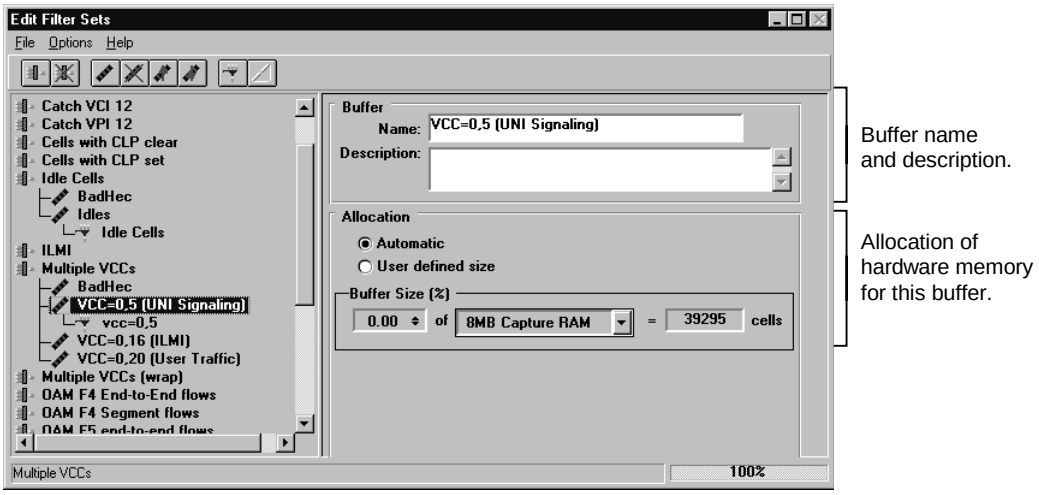
Removing a Buffer


Remove Buffer

If you find you no longer need a particular buffer, you can remove it from the cell library. To do this, first select any component of the buffer definition, then click the **Remove Buffer** button (or choose **Remove Buffer** from the **File** menu). The system verifies that you really want to remove the entire buffer, then deletes it from the library — including all component filter entries.

Modifying a Buffer Definition

The buffer definition window looks like this:



Follow the directions below to specify the buffer's name and description, and the percentage of total-buffer space allocated to the buffer.

Buffer Name and Description

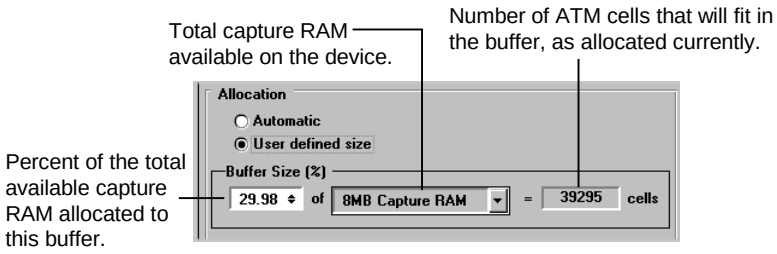
The buffer name displays as specified previously; change this name as necessary. Enter the description as any text you want: typically something that explains the overall purpose of the buffer. The description is only used in this window.

Buffer Allocation

Use the Allocation area to specify how much of the analysis device's available memory should be allocated for this buffer:

- **Automatic** instructs 622Vu Advisor to take all the buffers for which no explicit size is specified (i.e., all the Automatic buffers), then to divide the available (unspecified) space equally among these buffers. This is the initial setting for all *new* buffers. In the window shown above, BadHec is already defined as using 10.1% of the available buffer space, so this second buffer automatically receives the remaining 89.9%. The bottom right corner of the window indicates that 100% of the available buffer space is allocated.

- **User-Defined Size** specifies an exact percentage of the total buffer space to allocate to this buffer. You can either enter a value here, or use the spin control arrows to change the percent shown:



  The two grayed boxes to the right provide a tool that lets you determine the number of cells you can store in the buffer as allocated, based on a 32 MB device. This tool is advisory only, and has no effect on system processing. Use the drop-down list to select the device's capacity, then look in the box to the right to see the number of ATM cells that can fit in the allocated space. For example, we can store 131,072 cells using 25% of a 32 MB capture RAM.

Regardless of whether you're using automatic or user-defined sizing, the value displayed in the lower righthand corner changes as you adjust the allocation, to show the percent of total buffer space that's been allocated already. This value is only significant if you specify one or more user-defined sizes; 622Vu Advisor always distributes 100% of the available buffer space when all buffer sizes are determined automatically. If the total percent value changes to red, you've exceeded 100% of the buffer space and should check the defined allocations.

Note: Captured cells are blocked when they're stored in the filterset buffers, using a blocking factor of 512 cells (for 32 MB RAM). Because of this, 622Vu Advisor may make minor adjustments to your specifications to distribute the buffer space as precisely as possible.

Moving a Buffer Up or Down in the FilterSet

During capture processing, cells are placed in the first buffer where they match any of the filter entries for that buffer. The order in which the buffers are defined, then, can affect the cells captured. 622Vu Advisor lets you change the sequence of the buffers using the two buttons shown to the left (or by choosing **Move Buffer Up** or **Move Buffer Down** from the **File** menu). First select the buffer you want to move in the filterset list, then click the appropriate button.

8.5 Defining Filter Entries

Within each buffer[2], you'll define filter entries that specify exactly what cells you want to capture to that buffer. This section describes how to add a new filter entry (either from scratch or by cloning an entry that's defined already), to remove a filter entry, and to modify an entry's definition.

Adding a New Filter Entry


Add
Filter Entry

To add a new filter entry, click the toolbar's **Add Filter Entry** button (or choose **New Filter Entry** from the **File** menu). The system prompts for the name of the new filter, using the window shown to the right. Fill in the name and click **OK** to add a new (blank) definition. Proceed to *Modifying a Filter Entry* (page 148) for instructions to define the new entry.

Cloning a Filter Entry

Instead of adding a new filter entry from scratch, you can copy an existing entry then modify it. To do this, first select the entry you want to copy, then choose **Clone Filter Entry** from the **File** menu. The system prompts for a name to assign to the new copy, using a window similar to the one shown above for **Add** processing. Fill in the name you want and click **OK**. 622Vu Advisor copies the filter entry and stores it under the new name, placing it directly under the definition you copied. Change the definition as necessary, referring to *Modifying a Filter Entry* (page 148) for instructions.

Removing a Filter Entry


Remove
Filter Entry

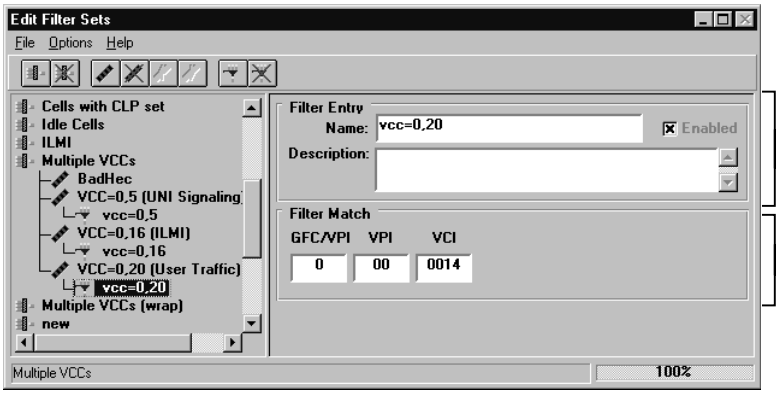
To remove a filter entry from the cell library, first select the entry you want, then click the **Remove Filter Entry** button (or choose the corresponding command from the **File** menu).

2 Exceptions are the two types of reserved buffers, CaptureAll and BadHec, which don't use filter entries.

The system verifies that you really want to remove the entry, then deletes it from the library.

Modifying a Filter Entry

The filter-entry definition window looks like this:



Note: If the filterset uses Advanced Filtering Mode, you'll see more fields in the Filter Match box. See page 149 for instructions in this case.

Follow the directions below to define the filter entry's name and description, and the filter match specifications. The Enabled check box in the upper right corner is always marked.

Filter Entry Name and Description

The filter entry's name displays as you specified it previously; change the name as necessary. Specify the description as any text you want; it's only used in this window to describe the entry.

Filter Match Specifications

Specify the Filter Match area as any set of GFC/VPI, VPI, and VCI header values you want to capture. Together these values comprise the address of a specific connection (0000014 in our example). Use hexadecimal or decimal values to indicate the specific bit settings: hexadecimal if the **Options** menu **Show Header Values in Decimal Format** setting is OFF; decimal if it is ON.

8.6 Advanced Filtering Mode

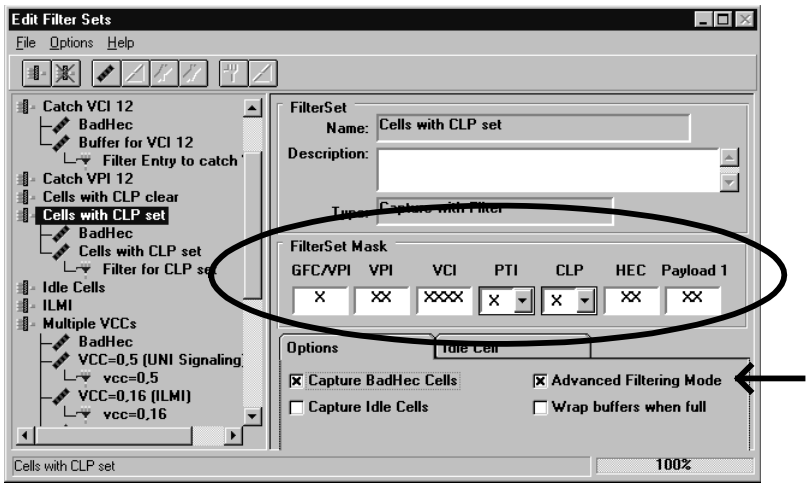
622Vu Advisor's advanced filtering features let you define a filterset-level mask that's combined with all other selection criteria when choosing the cells to include. This lets you specify a particular characteristic that you want across all captured cells, for example, or header fields you want to ignore completely

If you mark the Advanced Filtering Mode option for a filterset, the filterset definition and filter-entry definition windows offer enhanced masking capabilities. The filterset definition window lets you specify a filterset mask, and the filter-entry window uses that mask to offer extended filtering options.

Specifying a FilterSet Mask

With Advanced Filtering Mode on, the filterset definition window changes to include a filterset mask:

Use the FilterSet Mask area to identify those bit positions you want to examine, within each incoming cell.



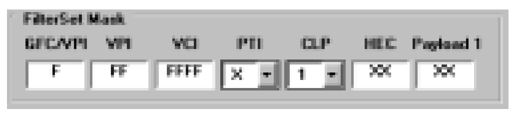
This lets you define a mask that's similar to the idle-cell mask described earlier, but in this case the mask identifies those bit positions you want to examine in each cell coming into the analysis device, for purposes of determining whether to capture the cell. Presumably at least one filter-entry definition references each bit position you ask 622Vu Advisor to examine.

You can examine any of the header bits, as well as the first byte of the payload. (This first payload byte lets you select AAL1 cells based on their SAR, for example.)

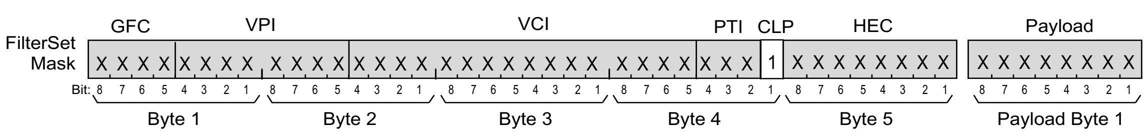
For each bit position, specify one of the values below, combining the 1s and 0s into hexadecimal characters for purposes of data entry (e.g., entering four 1s as a single hex F). Use hexadecimal if the **Options** menu **Show Header Values in Decimal Format** setting is OFF; decimal if it is ON:

Bit (s) Setting	Tells 622Vu Advisor…
0 (zero)	Ignore this bit position; it's not relevant to the filter.
1	Examine this bit position. Store the cell in this filterset if all positions corresponding to 1s in the mask contain the values (0 or 1) specified in the same bit positions in a filter entry.
X	Ignore all the bits in this field. If you use Xs in a field, the entire field must specify Xs.

By default (i.e., if you're not using advanced masking), 622Vu Advisor looks at the first 28 bit positions of each header (the GFC, VPI, and VCI fields). With advanced masking, it examines the first 48 bits (also the PTI, CLP, HEC, and first byte of the payload).



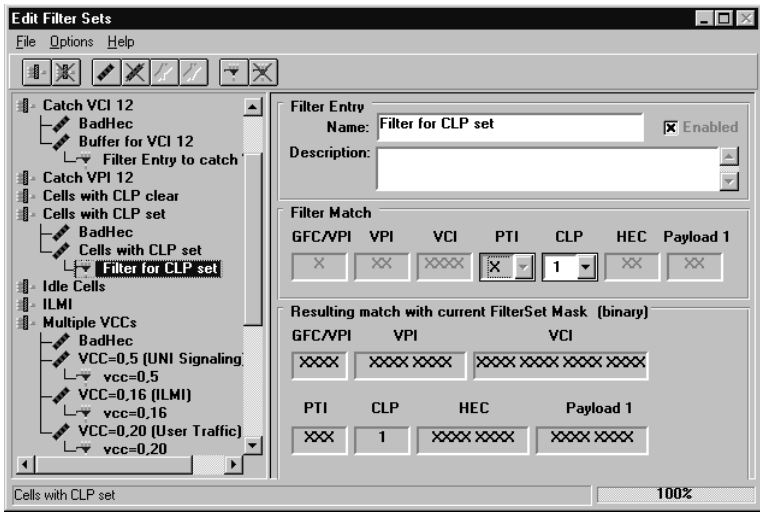
Change the mask as necessary, to indicate those bit positions you want to examine (mask value is 1), and those you want to ignore (mask value is 0). In the example shown to the right (and the corresponding bit mask shown below), we're asking 622Vu Advisor to look at the 1-bit CLP:



Filter Entries in Advanced Filtering Mode

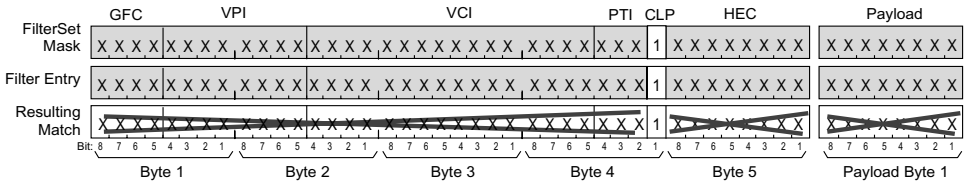
With Advanced Filtering Mode on, the filter-entry window lets you specify selection criteria based on all the header fields, as well as the first byte position of the payload. Any fields you've instructed 622Vu Advisor to ignore are grayed out in the Filter Match area, and shouldn't be entered.

Use the other character positions to specify bit values you want to match to incoming cells:



As you enter values in the Filter Match area, the composite (Resulting Match…) panel changes to show a binary representation of the actual values 622Vu Advisor searches for when comparing incoming cells to this filter entry's selection criteria. 622Vu Advisor combines (ANDs) the mask and filter-entry settings to compute a final match pattern.

In the example shown above (and corresponding bitmap below), we're looking for a CLP value of 1 (cells having a low priority). (✕ indicates positions that aren't examined:)



Chapter 9
Editing Transmit Sequences

622Vu Advisor lets you define and transmit sequences of cells used to analyze ATM equipment. You can create a transmit sequence in three ways:

- By defining a sequence explicitly.
- By using the AAL5 wizard to define a new sequence or append cells (AAL5 PDUs) at the end of an existing sequence.
- By capturing, then optionally editing, a series of cells.

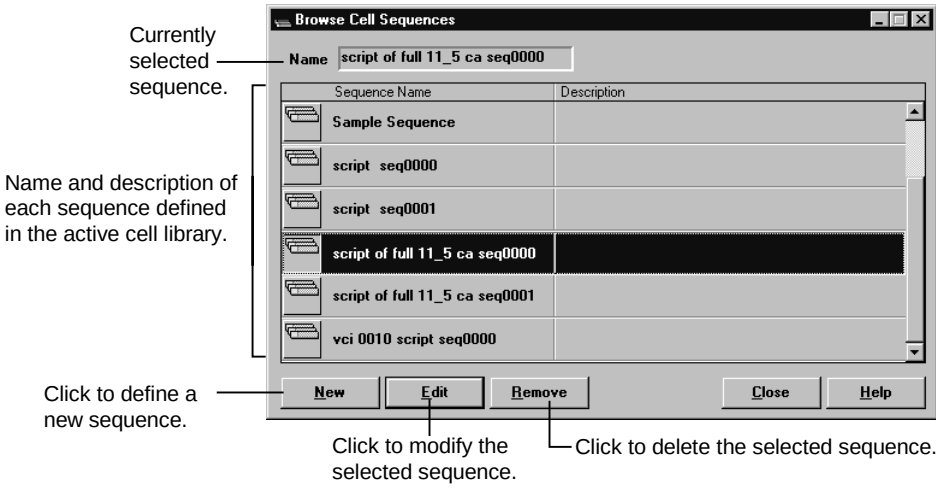
You can combine these approaches, to capture a basic sequence then edit individual cells and/or define additional cells for inclusion.

This chapter describes the first two approaches. As necessary, refer to ***Creating a Script From a*** Capture File on page 113 for instructions to create a new sequence from captured cells.

Initiating the Sequence Editor

Edit Transmit Sequences

To initiate the sequence editor, click the **Edit Transmit Sequences** button on the toolbar (or choose the corresponding command from the **Activities** menu). This displays a summary of the sequences defined so far, with the currently selected sequence identified at the top (Name field):



Review the information shown, then proceed as follows:

Click	To…
New	Define a new sequence.
Edit	Edit the selected sequence, or any cells defined in that sequence.
Remove	Delete the selected sequence. 622Vu Advisor displays a verification window before completing the request.
Close	Close the window.

Alternatively, choose **Cell Sequence AAL Wizards - AAL5** from the **Tools** menu to initiate the AAL wizard, which lets you create a new sequence that contains AAL5 PDUs, or add an AAL5 PDU to an existing sequence.

If you request **New** or **Edit**, or use the AAL5 wizard command:

- First read *Section 9.1 Inheriting Cell Characteristics* which describes the concept of *inheritance* as it relates to cell characteristics (properties). It's important that you understand this concept. You can save time during sequence definition, if you allow cells and sequences to inherit some or all properties.
- Proceed to ***Section 9.2 Creating or Editing a Sequence*** (page 157) to begin definition of a new sequence.

- Proceed to ***Section 9.3 Using the AAL5 Wizard*** (page 160) for instructions to create AAL5 PDUs using 622Vu Advisor's wizard capability. The wizard simplifies the task of creating PDUs for analysis, by formatting the SAR (Segmentation and Reassembly) and CPCS (Common Part Convergence Sublayer) settings for you automatically, and by computing the PDU's CRC.
- Proceed to ***Section 9.4 Defining the Cells In a Sequence*** (page 163) to define individual cells within a sequence.

9.1 Inheriting Cell Characteristics

The basis of 622Vu Advisor's ATM analysis involves transmitting and monitoring traffic at the cell level. 622Vu Advisor uses two entities to group and process cells:

- A **sequence** combines one or more individual cell definitions (and information telling it how to use those definitions). You'll access all cells through a sequence definition; each cell participates in one and only one sequence.
- A **script** combines one or more sequences to form a transmission used to analyze ATM networks and devices.

Conceptually, then, scripts are at the highest level, the sequences are at the next level, and cells are at the lowest level. This is illustrated in Figure 4.

Several cell-specific properties are maintained at each of the cell, sequence, and script levels. At each level, every individual property is either *defined* (i.e., set explicitly) or *undefined* (never set or set to the *undefined* state).

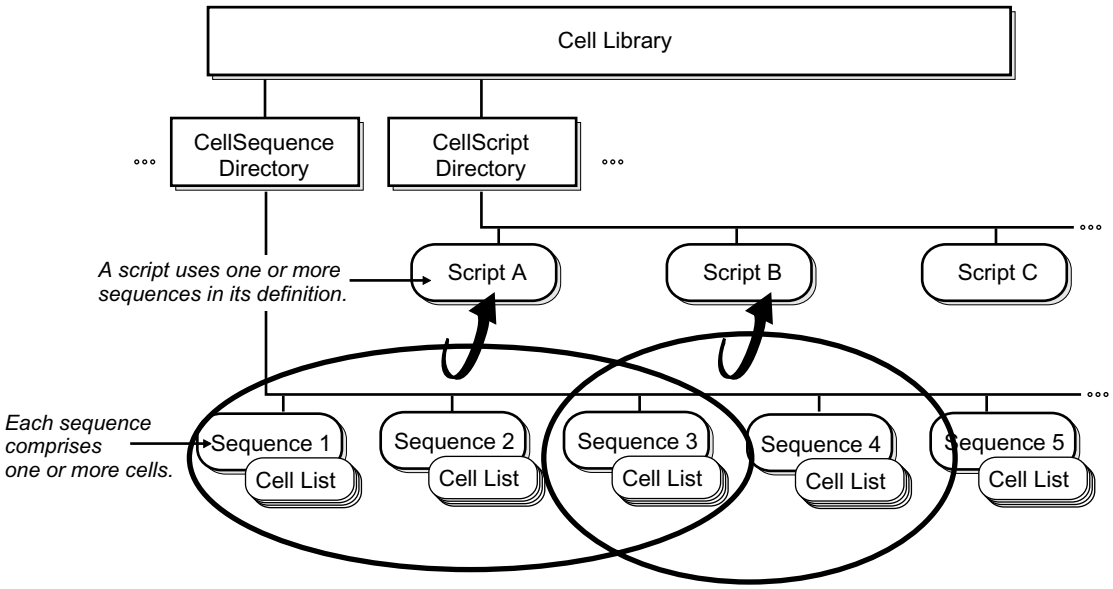


Figure 4. Logical Hierarchy of Cells, Sequences, and Scripts

You'll see how to *define* and *undefine* properties when you set up sequence and script definitions. Table 9 describes those properties that can be set from within 622Vu Advisor.

Table 9. Cell Header Properties That Can Be Inherited

Inheritable Property	Description
GFC	Generic Flow Control.
VPI	Virtual Path ID.
VCI	Virtual Channel ID.
PTI	Payload Type Indicator.
CLP	Cell Loss Priority.
Force-HEC-state	Indication of whether the state of the HEC is *defined* or not.

If a property is *undefined* at a particular level, its value is inherited from the containing object:

- A property that's undefined in a cell definition is inherited from the containing sequence (if defined there) or script (if not defined at the sequence level).

- A property that's undefined in a sequence definition is inherited from the containing script (then propagates down to any cells for which the property is undefined).

Put another way, when a property is *defined* in a sequence, that definition provides a master value that applies for any cells that are included in the sequence *and for which the property isn't defined specifically for the cell.* Similarly, when a property is *defined* in a script, that definition provides a master value that applies for any sequences included in the script, *if the property is undefined at the sequence level*.

If a property isn't defined at any of the three levels, it's assumed to be zero (0).

9.2 Creating or Editing a Sequence

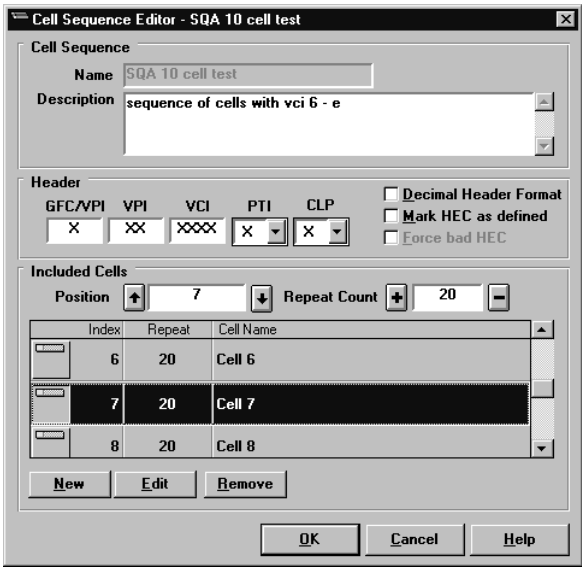

Edit Transmit Sequences

When you create or modify a sequence using the **Edit Transmit Sequences** toolbar button, your working window looks like this:

Sequence name and description.

Master property values (inherited by any contained cells for which the corresponding property is undefined).

Calls included in the sequence, in order as transmitted during script execution, and with a repeat count for each cell. Use this area to add, reposition, or remove a cell from the sequence; or to select a cell to be modified.

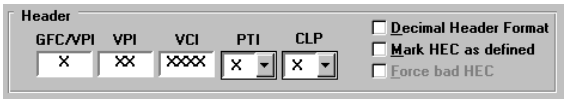


Use this window to identify the sequence (top-most area), specify master sequence values (middle area), and define/edit the cells in the sequence (bottom area).

Identifying the Sequence

Use the area at the top to identify the sequence. The sequence name (1–31 characters) is required when adding a new sequence, but is dimmed (not modifiable) when editing. The description is optional and can be any length.

Specifying Master Sequence Values



Use the second area to specify the sequence's master values, either typing a value in directly, or using the drop-down list to select the value you want. .

Make sure you have read *Section 9.1 Inheriting Cell Characteristics* on page 155 before assigning these values, and make sure you're familiar with the content and use of each field as it relates to ATM cells.

The master values are described below. One or more Xs in a field indicate that there's no defined value for that field; if a cell contained in the sequence inherits the corresponding property, that cell will have to look to the containing script for a value:

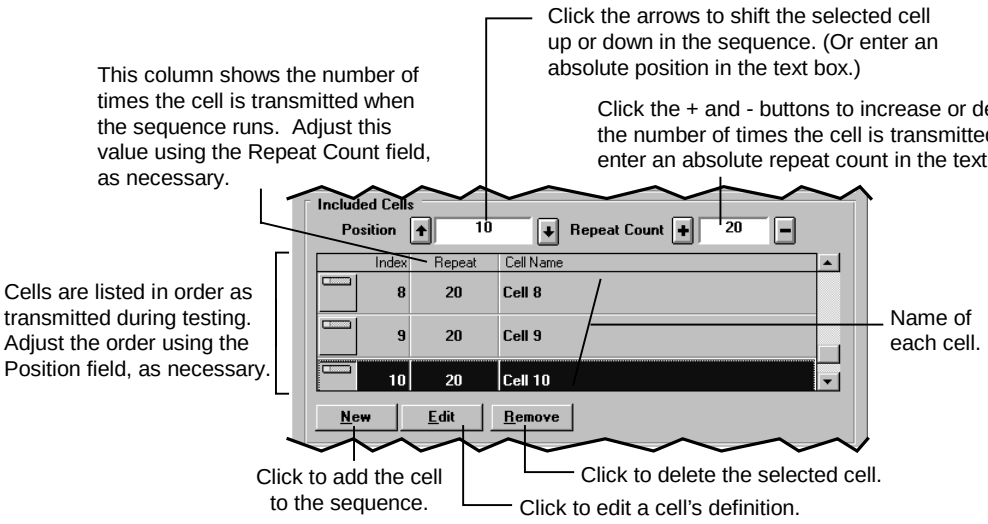
Field	Description
GFC/VPI	Generic Flow Control for UNI-formatted cells; generally always zero (0). Part of the VPI for NNI cells.
VPI	Virtual Path ID, in the range hex 0–FF; decimal 0–4095 (for a value intended to be inherited by NNI cells) or 0–255 (if intended to be inherited by UNI cells).
VCI	Virtual Channel ID, in the range hex 0–FFFF; 0–65535 decimal.
PTI	Payload Type Indicator. Use the drop-down list to select the value you want, in the range 0–7.
CLP	Cell Loss Priority. Use the drop-down list to select 0 or 1.

Use the check boxes to the far right to specify the format used for the header fields (decimal or hexadecimal), and to indicate whether the force-HEC-state property is defined.. Make sure to specify the header fields (above) using (hexadecimal or decimal) values appropriate to the current Decimal Header Format setting.

Check Box	Description
Decimal Header Format	Indicates whether the header values display as decimal or hexadecimal. Mark this box for decimal; leave it blank for hexadecimal.
Mark HEC as Defined	Indicates whether the force-HEC-state property is defined or not. Mark this box to specify the property as *defined*; leave it blank if the property is *undefined*. The next option applies if you specify *defined*.
Force Bad HEC	Does not apply for scripts run on the 622Vu Advisor device.

Defining the Sequence's Cell Content

Use the area at the bottom to define or modify the cells included in the sequence:



Cells are listed in order as transmitted during testing, and each cell has a repeat count that specifies the number of times it's sent (one after the other) when the sequence runs. You can adjust the order and count using the Position and Repeat Count fields, respectively.

Using this part of the window, you can:

Click	To...
New	Add a cell to the sequence, positioning it just after the currently selected cell.
Edit	Change the definition of a cell. As an alternative to clicking the **Edit** button, double-click the cell you want. 622Vu Advisor opens a window similar to that used for **New** processing, but with the cell's name and framing type grayed out; you can only specify the name and framing when you first define a cell.

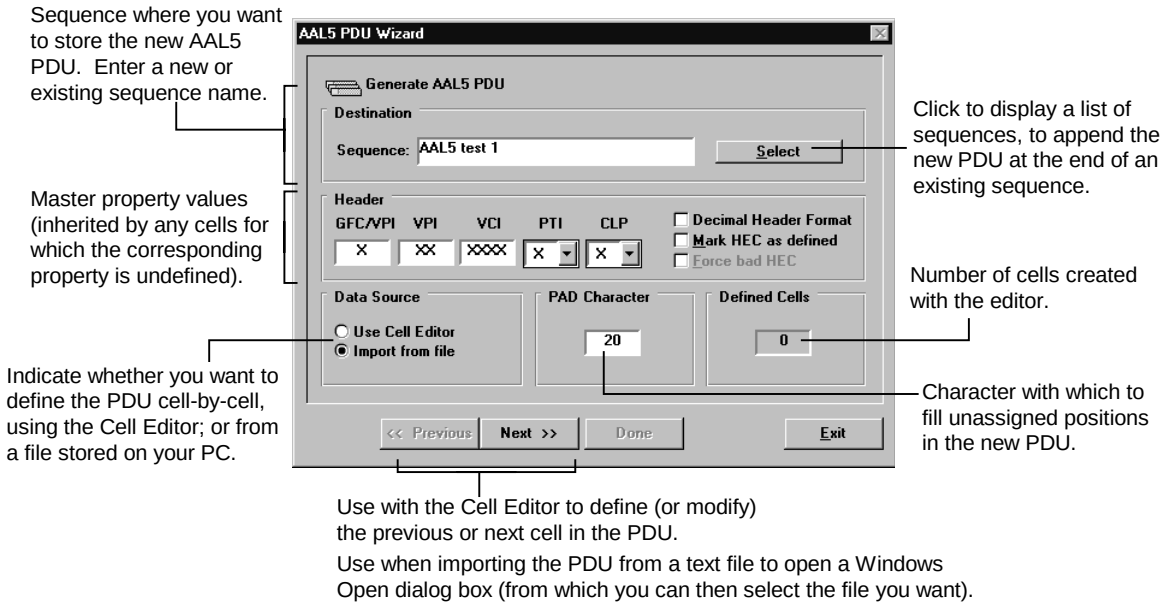
Remove Remove the selected cell.

For **New** and **Edit** processing, proceed to *Section 9.4 Defining the Cells In a Sequence*.

Note: As an alternative to defining a sequence's cell content, you can use the AAL5 wizard, described next.

9.3 Using the AAL5 Wizard

The AAL5 wizard lets you define AAL5 PDUs easily, without concern for accurate SAR and CPCS settings, and without having to compute the CRC. From 622Vu Advisor's main menu, choose **Cell Sequence AAL Wizards** - **AAL5** from the **Tools** menu to start the wizard:



In the top-most panel, enter either the name of a new sequence (to start a new definition) or the name of an existing sequence (to append the PDU at the end of an existing sequence). In the latter case, you can click the **Select** button to display a list of sequences that exist already, to choose the one you want.

Use the middle panel to specify the master sequence values, as described starting on page 158. For ease of processing, the <Enter> key tabs between the header fields indefinitely, as long as you stay in the Header area. Specify fields using

hexadecimal or decimal values, to correspond to the Decimal Header Format setting. One or more Xs in a field indicate that there's no defined value for that field.

Make sure you're familiar with the concept of *inheritance* as it relates to cell characteristics (properties) before assigning these header values, and make sure you're familiar with the content and use of each field. Use the check boxes to the far right to specify the format used for the header fields (decimal or hexadecimal), and to indicate whether the force-HEC-state property is defined.

If you're generating a new sequence, 622Vu Advisor assigns the header values at the sequence level, and sets up the individual cells to inherit header properties. If you're appending PDUs to an existing sequence, the header values specified here are inserted into each generated cell. (An X value will cause the cell to inherit the corresponding property in this case.)

Use the bottom-most area to:

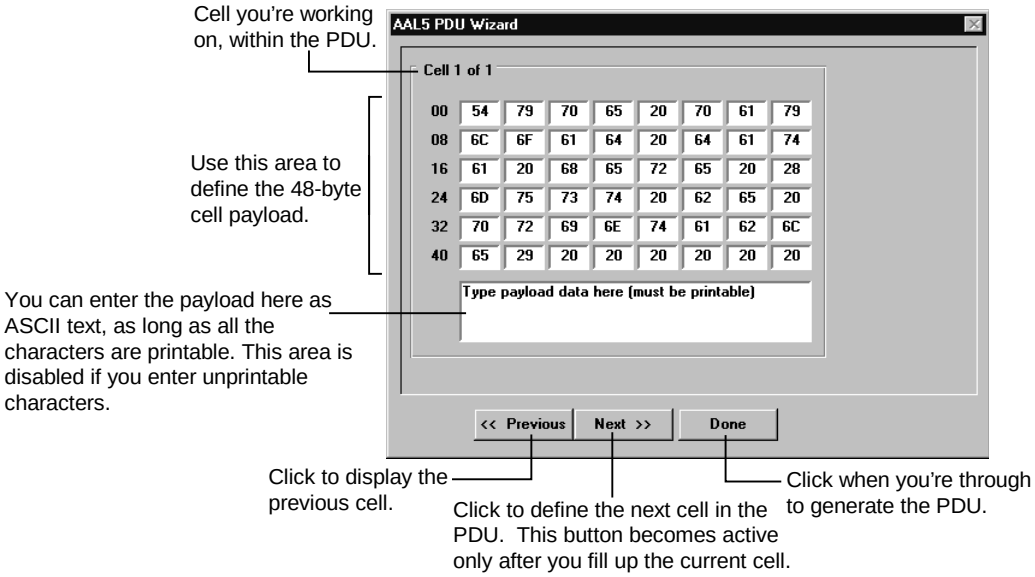
- Indicate whether you want to create the PDU cell-by-cell, using 622Vu Advisor's cell editor; or by importing the payload data from an external file stored on your Agilent Advisor. (You can use any file, up to 6MB in size.)
- Specify the pad character you want to use for unassigned positions in the payload.

Click the **Next** button when you're through, to begin definition of the payload. Here the processing varies depending on whether you're using the cell editor or a file to fill the payload (see *Using the Cell Editor* below, and *Obtaining the Payload From a File* on page 162).

In either case, after you're through defining the payload, 622Vu Advisor adds the new PDU to the sequence you're working on, then tells you how many cells are in the new PDU (right). This number includes the cells generated to store the payload (as specified), and may include an additional cell used for padding, as appropriate to the PDU.

Using the Cell Editor

If you request use of the cell editor, the system opens this window (shown filled in for the first cell):



Enter the payload data for the cell, using either method below:

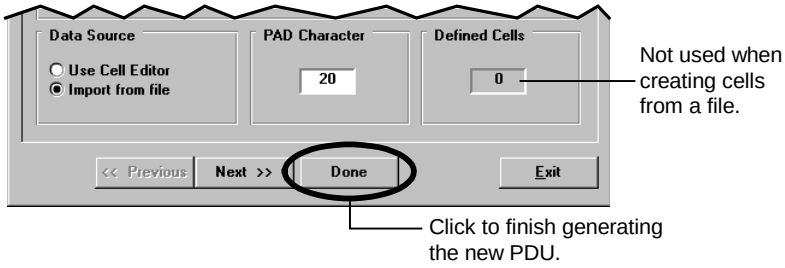
- Use the 48 text boxes to specify the data, entering each byte in hexadecimal format.
- Use the area below the text boxes to type in ASCII data. This option isn't available if unprintable characters are already defined in the payload (in reserved positions). In this case, the ASCII box is grayed, and unprintable characters display in that box as dots (.).

When you finish, either click **Next** to define the next cell in the PDU, or **Done** if you're through. This completes generation of the PDU and adds it to the sequence. As necessary, use the **Previous** button from any cell, to display/modify the previous cell definition.

Obtaining the Payload From a File

If you're creating the new PDU from a file, the system opens a standard file-open dialog box. Select the file you want to use to fill the payload for the new PDU. When you return to the wizard, the **Done** button is highlighted, indicating that the content of

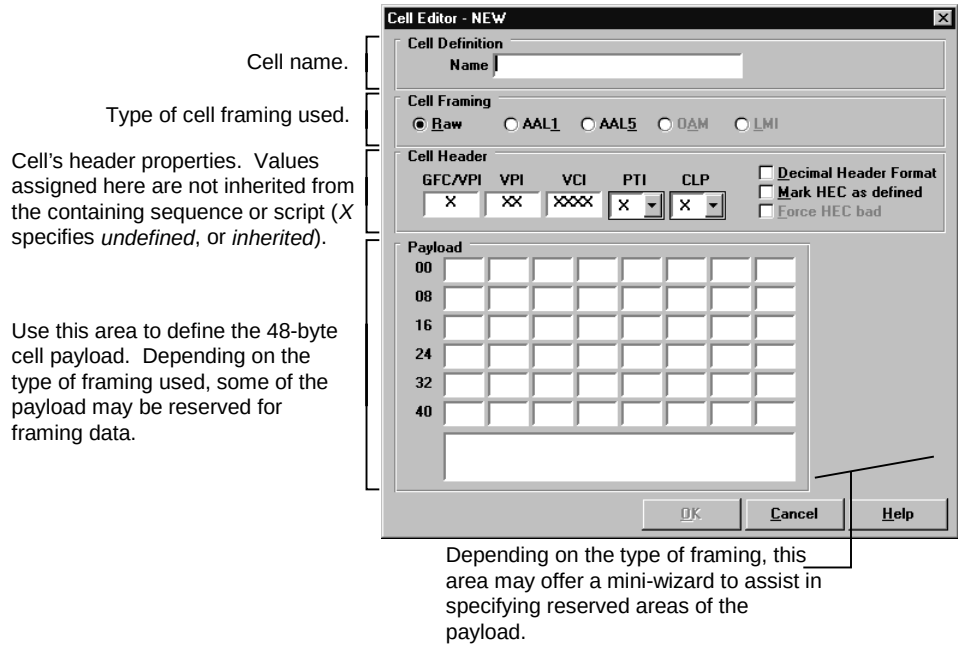
the file was moved successfully to the PDU:



Click **Done** to complete the PDU (and add it to the sequence you're working on). If you want to edit the new PDU, you can do so using the sequence editor (page 157).

9.4 Defining the Cells In a Sequence

When you use the sequence editor (page 159) to add a cell to a sequence, or to edit a cell that's already defined in a sequence, 622Vu Advisor uses the following window to prompt for the cell's content:



This window is the same for **New** and **Edit** processing, except that the name and framing type are grayed (not-modifiable) for an edit.

Follow the directions below to identify the cell, select the type of framing used, define the cell's header properties, specify the payload, and define any payload data that's specific to the type of framing used. When you're through with the cell definition, click **OK**.

Identifying the Cell

Use the area at the top to specify a 1–31 character cell name. This area is grayed out if you've already defined the name.

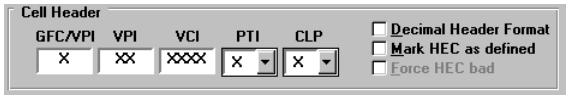
Identifying the Type of Framing Used

When you define a new cell, 622Vu Advisor lets you pick the type of framing you want to use. The lower right corner of the dialog box changes to provide a mini-wizard(s) appropriate to your selection, for use in constructing the reserved portions of the payload (nothing for Raw framing).

Framing	Description
Raw	There are no predefined framing characteristics. You can use the payload as you wish, forcing any values in any position.
AAL1	ATM Adaptation Layer that supports connection-oriented services requiring a constant bit rate, where those services have specific timing and delay requirements. AAL1 requires that you provide SAR (Segmentation and Reassembly) specifics, as detailed under *AAL1 Framing* on page 166.
AAL5	ATM Adaptation Layer that supports connection-oriented services using variable bit-rate transmissions, where those services don't require a bounded delay from source to destination. AAL5 is suitable for most data transmissions. AAL5 requires that you provide CPCS (Common Part Convergence Sublayer), SAR (Segmentation and Reassembly), and a Special setting, as detailed under *AAL5 Framing* on page 167.
OAM	Not currently available.
LMI	Not currently available.

Specifying Cell-Header Properties

Use the Cell Header area to specify the cell's header properties:

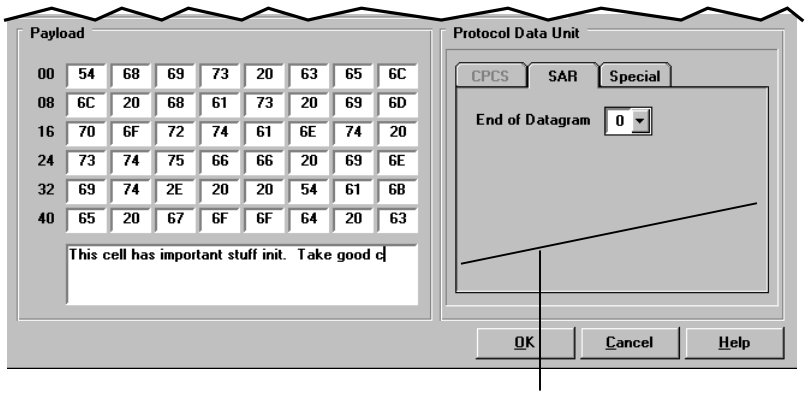


For ease of processing, the <Enter> key tabs between the header fields indefinitely, as long as you stay in the Header area. Use the check boxes to the far right to specify the format used for the header fields (decimal or hexadecimal), and to indicate whether the force-HEC-state property is defined.

Make sure you have read *Section 9.1 Inheriting Cell Characteristics* on page 155 before assigning these values, and make sure you're familiar with the content and use of each field as it relates to ATM cells. Specify fields using hexadecimal or decimal values, to correspond to the Decimal Header Format setting. The values you can enter are described under *Specifying Master Sequence Values* on page 158. One or more Xs in a field indicate that there's no defined value, and that the cell inherits a value from the containing sequence (if defined there) or script.

Specifying the Payload

The bottom left area of the window provides 48 character positions, allowing you to specify the cell's 48-byte payload. Unless you've selected Raw framing, however, some of the payload may be reserved. 622Vu Advisor provides mini-wizards to the right of the payload to assist in constructing the reserved portions of the payload (illustrated below for an AAL5 cell):



622Vu Advisor color-codes any reserved positions in the payload area, matching the color used with the corresponding framing specifications to the right (End of Datagram in the example above). See *AAL1 Framing* (page 166) and *AAL5 Framing* (page 167) for details about these framing specifications.

You can fill in any data you want in the unreserved payload positions. There are two ways to do this:

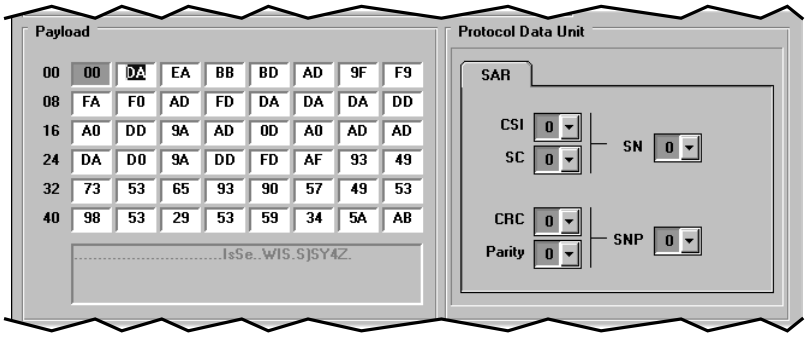
- Use the 48 text boxes to specify the data, entering each byte in hexadecimal format. When you close the cell definition, 622Vu Advisor fills all the remaining positions with spaces. If you don't specify any cell positions explicitly, 622Vu Advisor zero-fills the entire payload when you close the cell.
- Use the area below the text boxes to type in ASCII data. This option isn't available if unprintable characters are already defined in the payload (in reserved positions). In this case, the ASCII box is grayed, and unprintable characters display in that box as dots (.).

Raw Framing

If you select raw cell framing, 622Vu Advisor lets you specify any cell data you want, in any position. Raw cell framing is particularly useful for non-standard transmissions, as for a device that uses a proprietary signalling code.

AAL1 Framing

If you select AAL1 cell framing, 622Vu Advisor provides a mini-wizard to assist you in generating a correctly formatted cell (i.e., a cell with SAR information in the first payload position):



Use the drop-down lists in the mini-wizard to specify the Segmentation and Reassembly (SAR) settings you want. The first position in the payload is reserved for these (combined) settings and changes as you set each field:

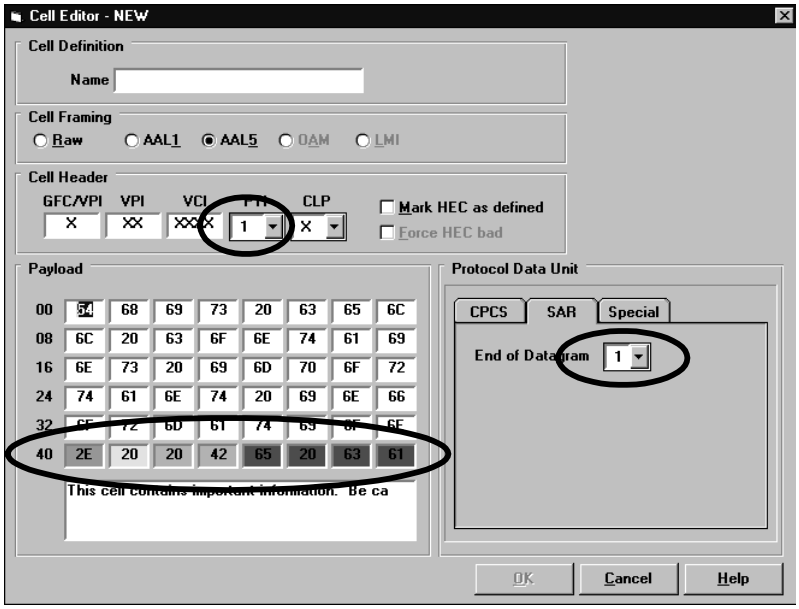
Field	Description
CSI	Convergence Sublayer Indicator, specified as 0 or 1.
SC	Sequence count, in the range 0–7.
SN	Serial number, specified as hexadecimal 0–F. This value is carried in the high-order four bits of the first payload byte. As an alternative to specifying this field, provide the CSI and SC values individually.
CRC	Checksum of the unframed payload data, in the range 0–7. AAL1 uses this CRC to verify correct transmission of the payload.
Parity	Parity used for transmission, specified as 0 (even) or 1 (odd).
SNP	Sequence Number Protection, specified as hexadecimal 0–F. This value is carried in the low-order four bits of the first payload byte. As an alternative to specifying this field, provide the CRC and Parity values individually.

AAL5 Framing

If you select AAL5 cell framing, 622Vu Advisor provides mini-wizards to assist you in formatting the cell's Segmentation and Reassembly (SAR), CPCS (Common Part Convergence Sublayer), and time-stamp (Special) information correctly.
Each has its own tab. Click each tab in turn, specifying information as described below.

SAR Settings

There's one SAR field. That field applies if this cell contains the end-of-datagram signal (i.e., if it's the last cell of the PDU):



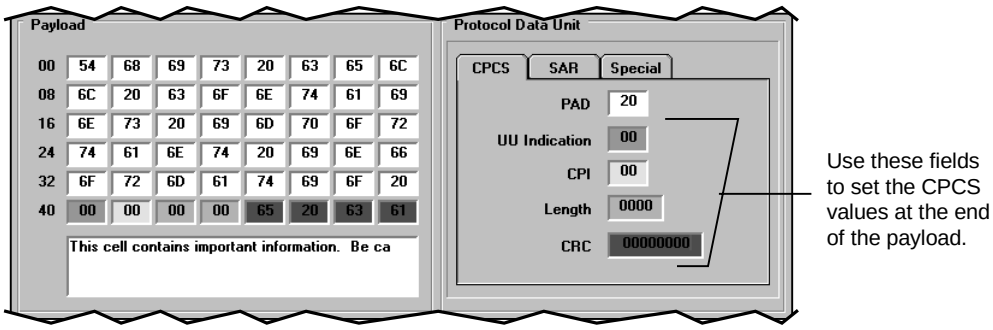
Specify zero (0) if the cell is not the last cell of the PDU; 1 to include the end-of-datagram signal. A zero value doesn't affect the payload. If you specify 1:

- 622Vu Advisor reserves the last eight bytes of payload. Click the CPCS tab to assign the value you want for each reserved field.
- The PTI in the cell header changes to reflect end-of-datagram signalling. You can override the PTI to change this setting, as necessary, but make sure the last bit of the value you specify is a 1 so it correctly reflects end-of-datagram signalling (1 and 3 are fine; 5 is out of range for AAL5).

Note: If you set End of Datagram ON (1) then turn it OFF (0), the positions that were formerly reserved remain set in the payload, although they can now be modified.

CPCS Settings

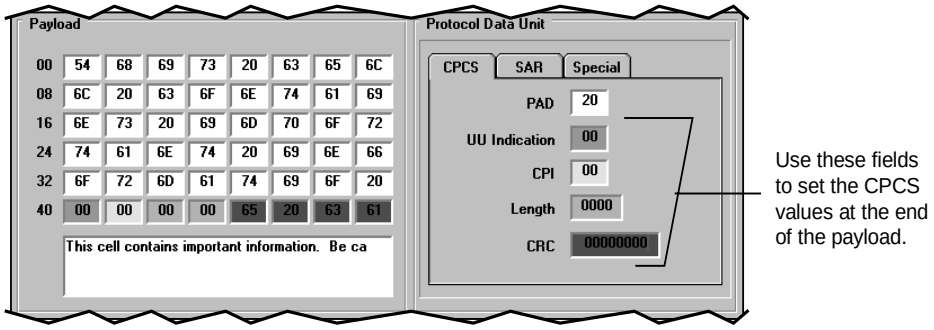
The CPCS (Common Part Convergence Sublayer) mini-wizard is enabled when you select end-of-datagram signalling using the SAR tab. Click the CPCS tab to assign values to the positions reserved for end-of-datagram information. All settings are in hexadecimal format.



Field	Description
PAD	Character with which to fill unassigned positions in the payload.
UU Indication	User-to-user indicator (generally zero).
CPI	Common Part Indicator, or message type (generally zero).
Length	Length of the entire packet (data only, excluding any end-of-datagram signal).
CRC	Computed CRC checksum for the payload.

Special Settings

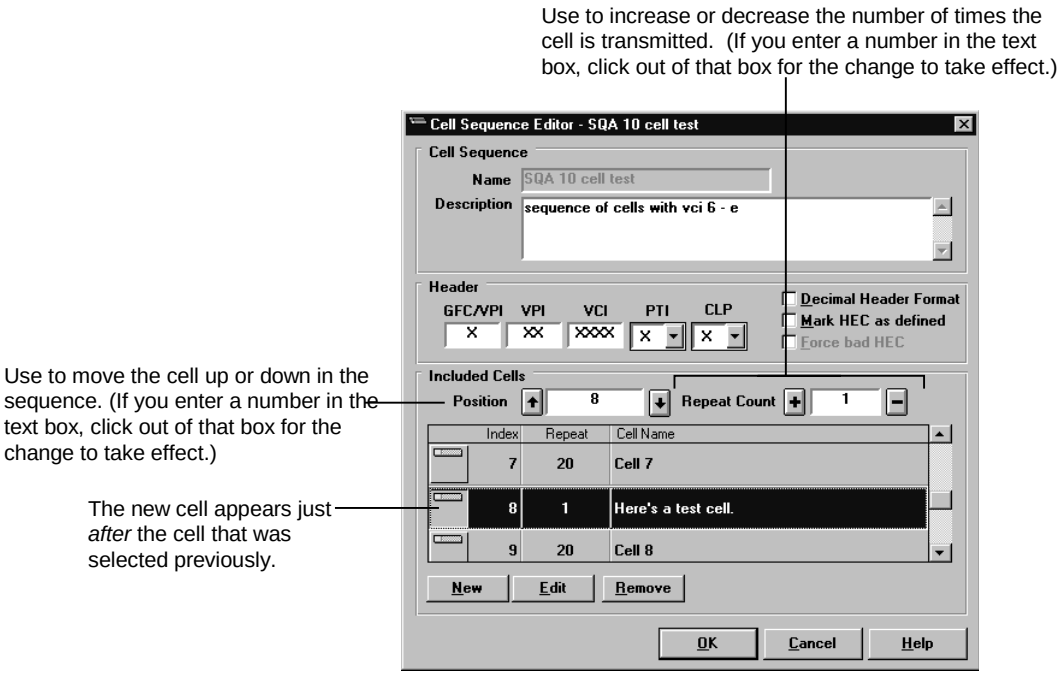
There's one Special field, used to specify whether in-payload-timestamp-generation is on or off for the cell. With this property on (the check box marked), 622Vu Advisor places a timestamp in the cell payload before it's transmitted, overriding bytes 8–10 and 12–14 for this purpose:



Note: If you insert a timestamp then remove it (by clearing the check box), the positions that were formerly reserved remain set (to 00) in the payload, although they can now be modified.

Saving Cell Changes

When you're through with the cell definition, click **OK**. Here's the sequence display with one cell added:



New cells are inserted just below the previously selected cell. Use the Position arrows as necessary to shift the cell's location relative to other cells in the sequence, and the Repeat Count arrows to specify the number of times the cell should repeat in the sequence. In either case, if you enter a number in the text box, click outside of that box for the change to take effect.

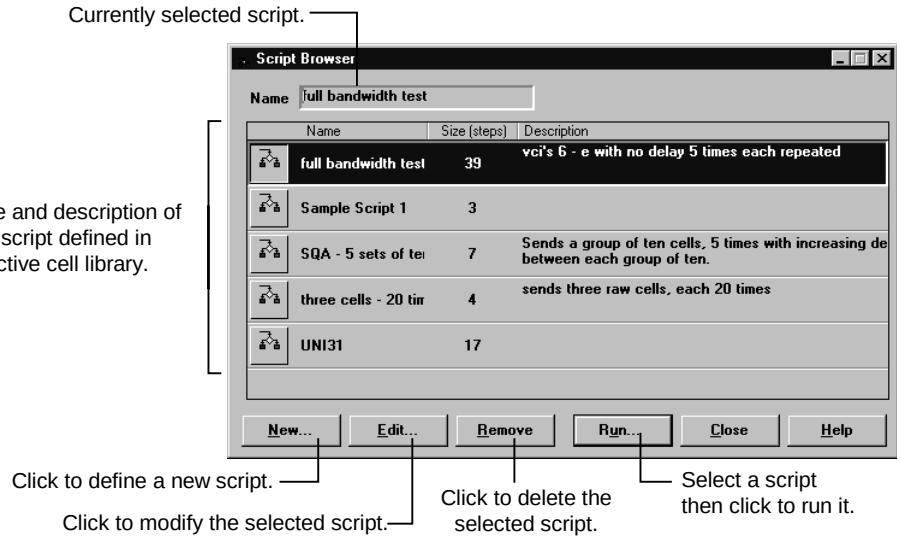
Chapter 10
Running & Editing Scripts

A script defines a specific ATM-cell traffic pattern, including timed pauses, that can be sent from an analysis device across an ATM network to test its transmission capabilities. At any point in time, you can have one transmission script running from each analysis device that's accessible to your system.

The specific traffic pattern for each script is defined via one or more predefined sequences (see Chapter **9**, starting on page 153). This chapter describes how to display and execute scripts, then provides instructions to define new scripts.


Transmit Scripts

To begin processing a script, either click the **Transmit Scripts** toolbar button (shown to the left) or choose **Transmit Scripts** from the **Activities** menu. Either approach opens the window shown below, which lists each transmission script in the active cell library, with the currently selected script identified at the top (Name field):



Review the information shown, then proceed as follows:

Click	To…
New	Define a new transmission script. (As an alternative to defining a transmission script explicitly from scratch starting from this button, you can create a script from a capture file. This feature is described in Chapter **6**, starting on page 113.)
Edit	Edit the selected script.
Remove	Delete the selected script. 622Vu Advisor displays a verification window before completing the request.
Run	Execute the selected script (same as double-clicking that script).
Close	Close the window.

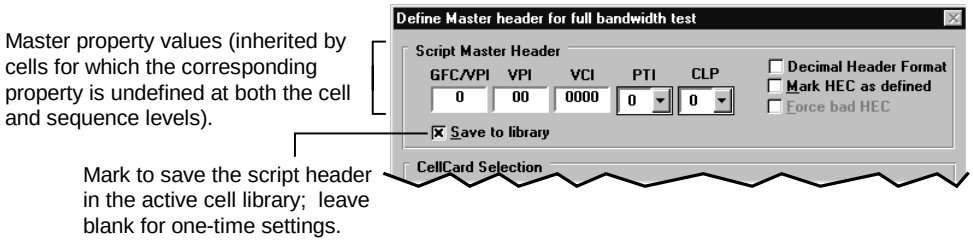
If you request **New** or **Edit** processing, see *Section 10.2 Creating or Editing a Script* on page 177. If you request **Run**, proceed to the next section for instructions.

10.1 Running a Script

To initiate a script, select the script you want and click **Run** (or double-click the script). 622Vu Advisor asks you to define the script's master header properties, and to identify the device from which to transmit the test.

1. Use the top-most panel to specify the script's master header properties. Use the check boxes to the far right to specify the format used for the header fields (decimal or hexadecimal), and to indicate whether the force-HEC-state property is defined.

   Enter the properties as hexadecimal or decimal values to correspond to the Decimal Header Format setting:

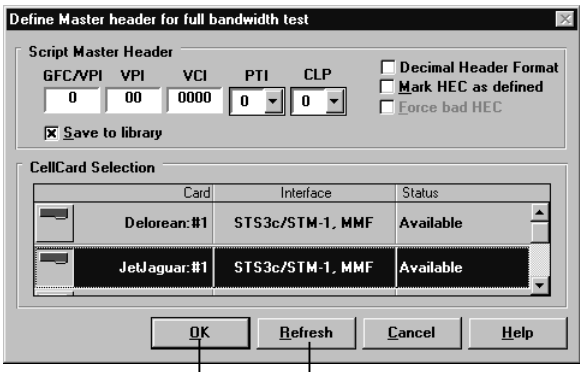


   Make sure you've read *Section **9.1 Inheriting Cell Characteristics*** on page 155 before assigning these values, and make sure you're familiar with the content and use of each field as it relates to ATM cells. The specific values

you can enter are described under ***Specifying Master Sequence Values*** on page 158.

2. Mark the Save to Library check box if you want to save the header on the active cell library; otherwise (for a one-time setting) leave it blank.

3. Select the analysis device where you want to run the script, from the list at the bottom of the processing window. This list includes each device available to you.



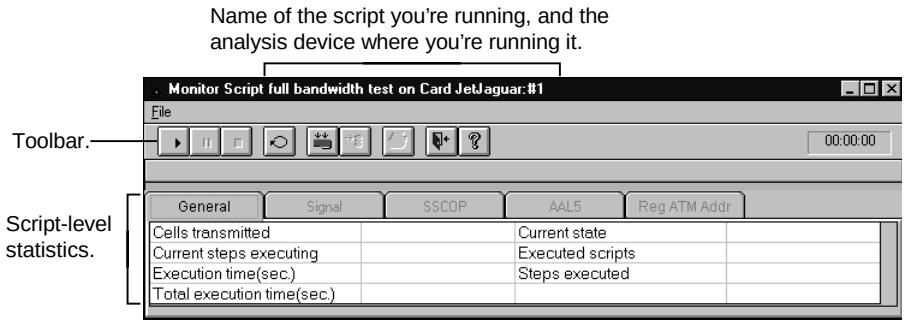
Field	Description
Card	System name to identify each device, followed by a number (always 1).
Interface	Type of connection supported between the analysis device and ATM device.
Status	Always "Available," indicating that the device is currently available for use.

Note: In order to execute a script, the analysis device must be configured as an active end station. Refer to Chapter 4 for related configuration instructions, as necessary.

You can monitor the physical interface to the ATM device while the script runs, as described in Chapter **5**.

You'll only see those devices that are available for use currently. If a specific device is already performing RAM-intensive activity (such as a capture), it won't appear in the list. If you expect to see a device that isn't here, click the **Refresh** button to reevaluate its status.

After you select an analysis device and click **OK**, 622Vu Advisor opens a Monitor Script window, through which you'll control and monitor the actual script execution:



There are two parts to this display:

- The toolbar lets you control the actual script execution.
- The area below the toolbar shows five tabs, but only the left-most (General) tab is used, and shows script-level statistics.

Using the Toolbar Buttons

Use the toolbar to direct script processing, referring to Table 10 for instructions.

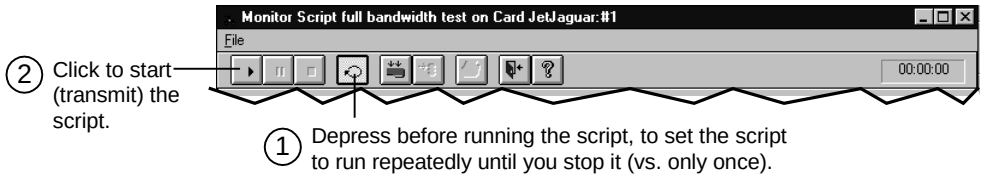
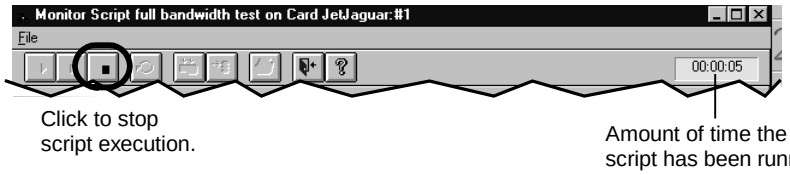


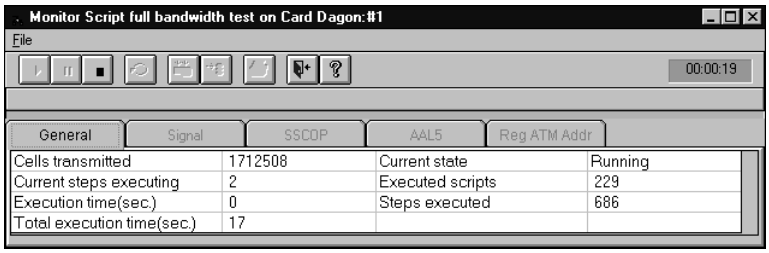
Table 10. Script Execution Menu Commands and Toolbar Buttons

Menu Command	Button	Used to…
Start Script		Start the script (i.e., begin transmission of the sequences in the script). After you start the script, the elapsed-time counter (right) becomes active, allowing you to track the time since execution began:  The **Stop Script** button is also enabled, allowing you to stop transmission at any time.
Pause Script		Pause the script. Not currently implemented.
Stop Script		Stop the script (only available during execution). When you click this button, the **Start** button is enabled, allowing you to restart the same script.
Run Continuous		Indicate whether to execute the script once or continuously (depressed for continuous execution). Even if you run the script continuously, you can stop it at any time using the **Stop Script** button.
Setup Script		Display the first window opened when you ran the script, allowing you to respecify master header values and the analysis device you want to use.
Configure Script Monitor Parameters		Not used.
Print Log		Not used.
Exit		Exit from the script-execution window.

If you interrupt the script, the elapsed-time field stops counting and changes from green to red. You can rerun the script any number of times by simply clicking the **Start** button. The elapsed-time field resets itself after a restart, as do the statistics and graph (as applicable to the script you're running).

General Tab Statistics

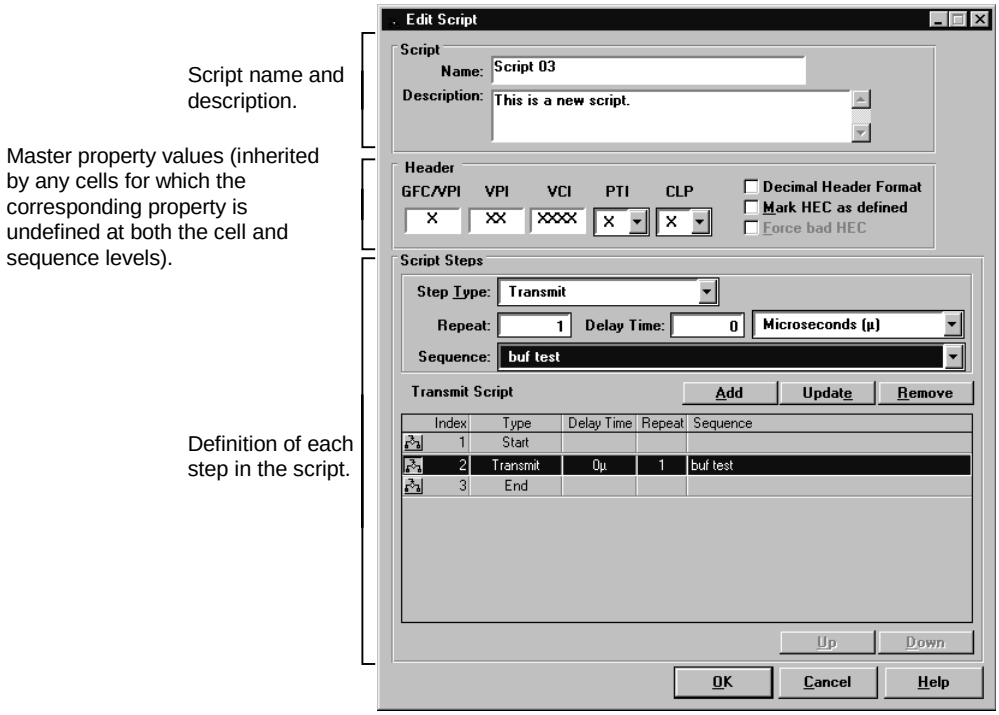
When you run a script, the Monitor Script window displays statistics related to script execution. The following statistics display on the General tab. (The other tabs are disabled for transmission scripts.)



Statistics	Represents the...
Cells Transmitted	Number of cells transmitted since the script started to run. You can graph this statistic.
Current State	Current internal state of the script execution.
Current Steps Executing	Number of the step that's currently executing, as identified in the script definition.
Executed Scripts	Number of times the script has been run; meaningful with **Run Continuous** selected.
Execution Time (sec.)	Amount of time it takes to execute the script, in seconds. If **Run Continuous** is selected, this is the amount of time it takes to run the script one time.
Steps Executed	Number of (valid) steps executed already, for the script that's running currently.
Total Execution time (sec.)	Total time elapsed since the script first started to run, in seconds. Includes all cycles if the script is set to **Run Continuous**.

10.2 Creating or Editing a Script

When you create or modify a script, your working window looks like this (shown below for creating Script 03):



Use this window to identify the script (top-most area), specify master cell-header properties (middle area), and define the specifics of the script itself.

Identifying the Script

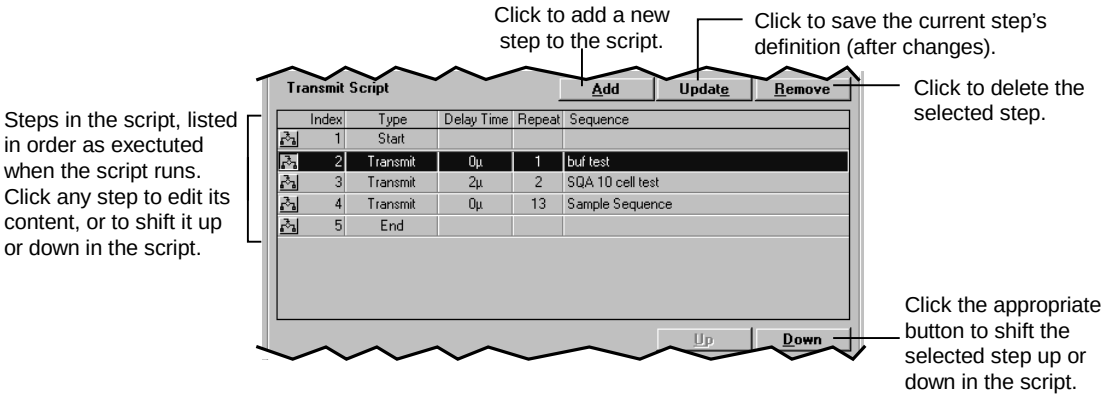
Use the area at the top to identify the script. The script name (1–31 characters) is required when adding a new script, but is dimmed (not modifiable) when editing. The description is optional and can be any length.

Master Cell-Header Values

Use the second area to specify default cell-header properties; i.e., properties to be assigned to any cells for which these properties aren't defined explicitly at the cell or sequence level. Refer to page 158 for the specifics of these settings.

Defining the Specifics of the Script

The Script Steps panel lists all the steps in the script, in order as transmitted during execution. There's a repeat count for each step. You'll use this area to add or remove a step from the script, or to select a step to be modified.



Use the buttons in this area to specify the type of processing you want:

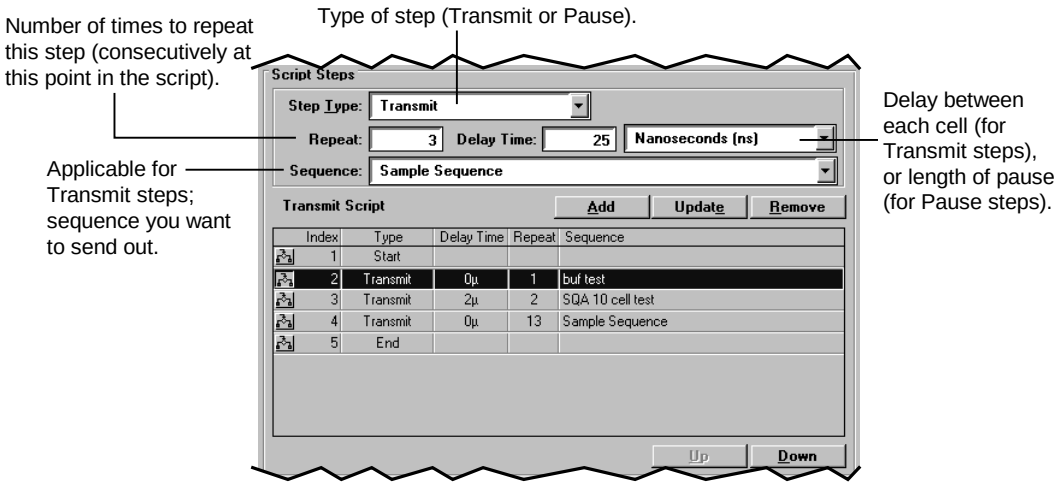
Click	To…
Add	Add a new step to the script, positioning it just after the currently selected step.
Update	Revise the definition of the currently selected step.
Remove	Remove the selected step. 622Vu Advisor verifies your request before deleting the step.
Up	Shift the currently selected step up one position in the script.
Down	Shift the currently selected step down one position in the script.

Each script begins with a Start step and ends with an End step. You can add any combination of transmit and pause steps between these special markers. The top of the Script Steps panel defines the currently selected step, or a new step you're defining.

Adding or Updating a Step in the Script

For a new or modified step, use the top of the Script Steps panel to define the characteristics of the step. As identified by the Type field, each step is either a Transmit (which sends a sequence out from the analysis device) or a Pause (which pauses a specified amount of time).

When you're through defining the characteristics of the step, click **Add** to add the specifications as a new step, placing it just below the step that's selected; click **Update** to modify the currently selected step.



For a Transmit step, specify the following fields:

Field	Description
Step Type	Type of step (always Transmit).
Repeat	Number of times you want to repeat the sequence associated with the step. When the script runs, the analysis device transmits the sequence consecutively the specified number of times.
Delay Time	Number of milliseconds, microseconds, etc., to pause between repetitions of the sequence (you select the units). The maximum delay time is 6.5535 milliseconds.
Sequence	Name of the sequence you want to send when this step executes. Either type the name of a sequence here directly, or select one from the drop-down list. ***Note***: You can specify a sequence that you haven't defined yet, as long as it's defined before the script runs.

For a Pause step, specify the following fields:

Field	Description
Step Type	Type of step (always Pause).
Delay Time	Number of milliseconds, microseconds, etc., to pause at this point in the script execution (e.g., 5 seconds, or 750 milliseconds — you select the units). There's no reasonable limit to the time you can enter here.

10.2 Creating or Editing a Script

Chapter 11
Using the Ping Generation Tool

The Ping Generation tool lets you transmit standard *ping* messages through an ATM network, targeting a specific destination address. You control the packet size and the number of packets sent.

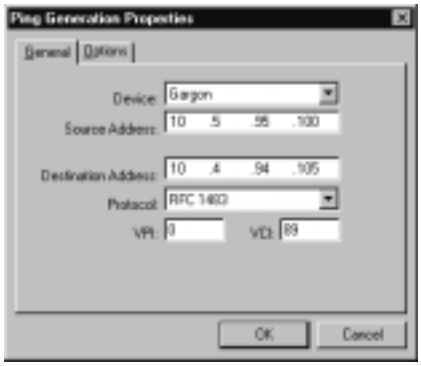
This feature is available for use with devices configured in end-station mode.

Starting Ping Generation


Ping Generation

Click the **Ping Generation** button to initiate this feature of the system. This opens a dialog box through which you'll specify the properties you want (packet size, number of packets to send, etc.).

Specifying Properties to Use



First select the General tab then specify the following information:

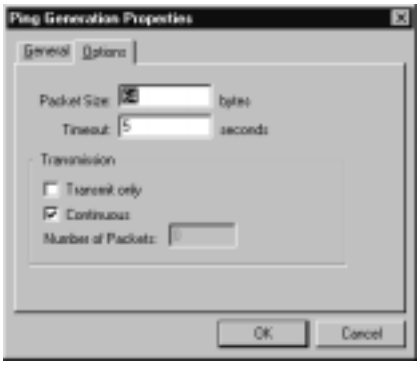
- Use the **Device** drop-down list to select the analysis device to use. As noted above, this must be configured as an end-station device.
- Enter the Source Address to identify the analysis device you're using. This is the address to which the remote device sends it's reply, after receiving each *ping* message. Make sure to specify an IP address that's different from the IP address of the device's Ethernet port.
- Specify the Destination Address of the end station you're testing (i.e., the target station to receive the *ping* messages).
- Select the Protocol to use when transmitting the messages:

Protocol	Description
RFC 1577	Classical IP and ARP over ATM.

Protocol	Description
RFC 1483	Multiprotocol Support over ATM AAL5.

- Specify the **VPI/VCI** over which to transmit the *ping* message(s).

Then select the Options tab and specify the:

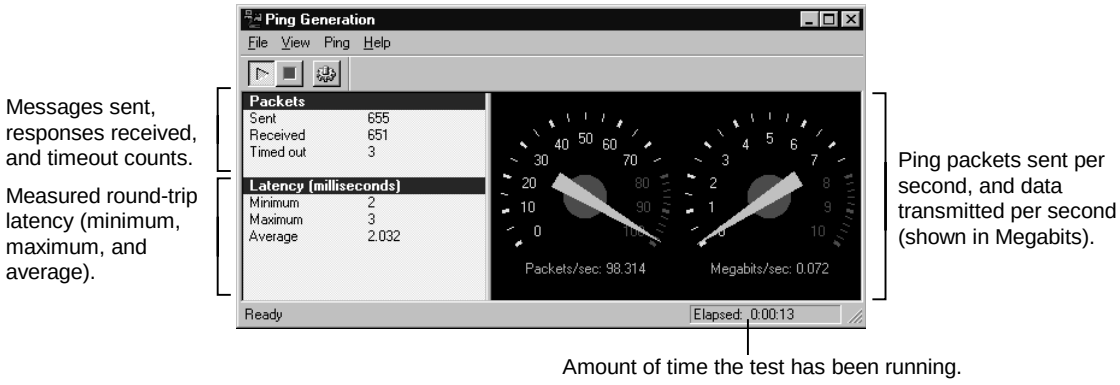


- Packet Size of each message sent (4096 bytes maximum). This size does not include overhead for encapsulation.
- Timeout period, in seconds. This is the maximum amount of time 622Vu Advisor will wait for a response to each message sent before timing out. Applicable only if the Transmit Only box is unmarked.
- Type of Transmission requested:

Selection	Description
Transmit Only	Mark to transmit messages without regard to a response; leave blank if you want to wait for a response from each message sent.
Continuous	Mark to send *ping* messages repeatedly, until you stop the transmission explicitly. With this box unmarked, you can specify the **Number of Packets** to send.

Running a Ping Test

After you specify the properties you want, click **OK** to run the test. 622Vu Advisor opens this *ping*-test monitoring window:

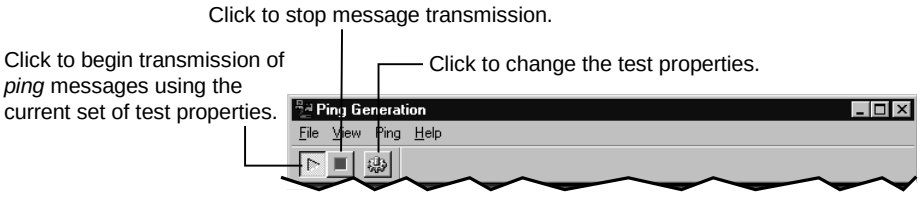


The lefthand side of the display shows packet counts and latency information:

- **Packets** displays the number of packets sent, the number of those packets for which responses were received, and the number that timed out before a response was received.
- **Latency** displays the minimum, maximum, and average latency (measured round-trip times) for all transmissions, measured in milliseconds.

The righthand area provides a graphic representation of the number of packets transmitted per second (left), and the total amount of data in those packets (measured in Mbps (Megabits per second, shown right).

The toolbar lets you stop/start the transmission of messages, or open the dialog box used to specify the test properties (described above):



If you stop transmission of *ping* messages (or the transmission ends automatically), the elapsed-time field stops counting. You can retransmit the messages any number of times by simply clicking the **Start** button. The elapsed-time field resets itself after a restart, as do the statistics and graphics (right).

Menu Commands

As necessary, use the menu commands as follows:

Table 11. Ping Generation Menu Commands and Toolbar Buttons

Menu Command	Button	Used to…
File		
Exit	—	Exit from the Ping Generation test window.
View		
Toolbar	—	Toggle display of the toolbar.
Status Bar	—	Toggle display of the status bar (bottom of window).
Ping		
Start		Start transmission of *ping* messages. When you do this, the elapsed-time counter (bottom right) becomes active, allowing you to track the time since transmission began: The **Stop** button is also enabled, allowing you to stop transmission at any time.
Stop		Stop transmission of *ping* messages. When you click this button, the **Start** button is enabled, allowing you to restart the same set of messages.
Properties		Open the dialog box used to specify *ping*-test properties.
Help	—	Display online Help and/or general information about the Ping Generation tool.

Chapter 12
Using QoSMeter

QoSMeter is an analysis tool designed to test the quality of service on a particular virtual circuit. Using QoSMeter, you first define the set of tests you want to run. Each set of tests comprises a ***session***. The tests in a session are identical, and are defined in terms of the amount of data to send (test size), the percent of bandwidth to use when transmitting the test, and the percent of bandwidth committed to background traffic.

Next you run the session, transmitting test traffic from your analysis device, across a virtual circuit, then back to the same (or another) analysis device. You (or another user) can monitor the test traffic as it's received.

QoSMeter supports two types of sessions:

- **Constant Bit Rate (CBR) sessions** transmit and analyze data. The data travels out through the virtual circuit, then back to either the same or a different analysis device. QoSMeter measures various statistics, with an emphasis on variation in cell delay.
- **Round-Trip Delay (RTD) sessions** transmit data from the sending device through the virtual circuit, then back to the same analysis device. QoSMeter measures statistics with an emphasis on the latency of data transmission.

QoSMeter requires one set of parameters for data transmission (known as *generation* parameters), and one for analysis at the receiving end (known as *analysis* parameters). For RTD tests, you always combine the generation and analysis parameters in a single session definition. For CBR tests, you have the choice of defining them separately or together.

- The *generation* component of the session specifies the VCC over which to transmit the session, the size of each test, and the percent of bandwidth to use for test vs. background traffic. It also specifies the frequency at which to run the tests in the session (e.g., once every half hour, twice daily, etc.), and specific tolerance levels for failure.
- The *analysis* component of the session specifies the VCC over which to receive the session traffic, and specific tolerance levels for failure. It *can also include* specific settings that match or restrict those of the actual session being received. In the absence of these specifications, the analysis end of the session *auto-detects* session traffic as it enters the analysis device.

When you run the session, QoSMeter lets you monitor the results as it proceeds. There are three tabs in the monitor display, respectively used to:

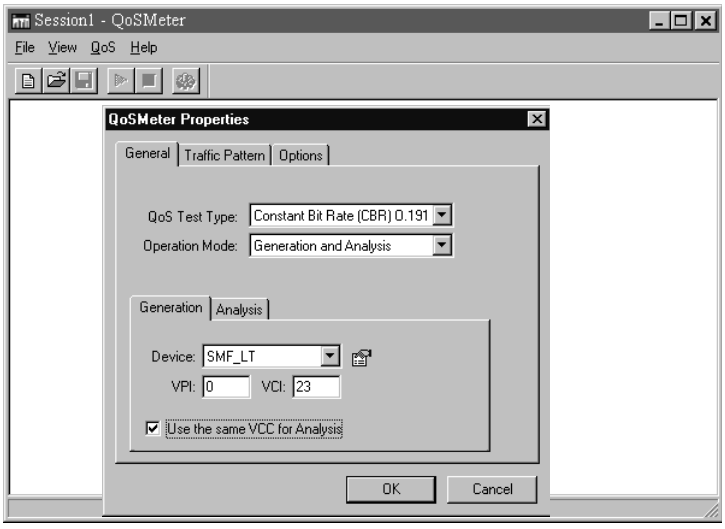
1. Summarize the results of the session (*current*, *average*, *best*, and *worst* for each of several statistics).
2. List specific counts and rates for each test.
3. Graph the number of cells per Cell-Delay Variation (for CBR sessions) or per Round Trip Delay (for RTD sessions), for one or more tests.

If desired, you can save session results for later review.

12.1 Getting Started


QoSMeter

Click the **QoSMeter** button to initiate this feature of the system. This opens the QoSMeter monitoring window, with the Properties display in front of it:



Click on each tab, in turn, to define the properties appropriate for your session. The remaining sections describe how to define (or edit) and run a session:

- ***Section 12.2 Defining a Constant Bit Rate (CBR) Session***, describes how to define a new Constant Bit Rate session.
- ***Section 12.3 Defining a Round-Trip Delay (RTD) Session***, describes how to define a new Round-Trip Delay session.
- ***Section 12.4 Running a Session***, tells how to run and monitor a session.

Menu and Toolbar Commands

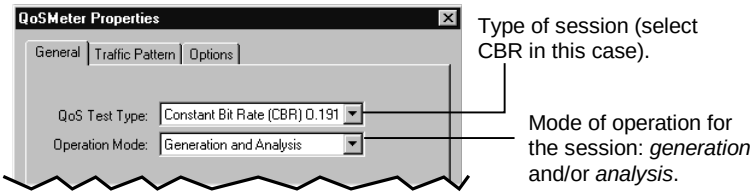
At any point, you can return to the main QoSMeter display and use the menus/ toolbar as described below. Shaded items apply only when running a session.

Table 12. QoSMeter Menu Commands and Toolbar Buttons.

Menu Command	Button	Used to…
File		
New		Define a new QoSMeter session.
Open		Open the results of a session that was saved previously.
Save		Save the most recent set of results. Use the standard Save dialog box to assign a name to the results, using the format *name*.qos. If you omit the suffix, QoSMeter assigns it correctly. Session results can be stored anywhere, but typically reside in the \qos directory.
recent-file list	—	List of the most recently opened session results.
Exit	—	Exit from QoSMeter.
View		
Auto Update Graph	—	Revise the graph continuously as the session runs, always using two sets of values: those for the overall average of all tests, and those for the current test.
Graph Selected Tests	—	Graph the results of selected tests, showing the results of each test individually, and the overall average of all selected tests (or the average of all tests run so far, if you only select one test to graph). Applicable after selecting one or more tests to graph.
Toolbar	—	Toggle display of the system toolbar.
Status Bar	—	Toggle display of the status bar (bottom of window).
QoS		
Start		Begin transmission of the session data. After you start the session, the elapsed-time counter becomes active, allowing you to track the time since testing began. The **Stop** button is enabled, allowing you to stop transmission at any time.
Stop		Stop the session (only available during execution). When you click this button, the **Start** button is enabled, allowing you to restart the same session.
Properties		Open the dialog box used to view/modify the session properties.
Help	—	Display standard Windows Help, technical information about the product, or general product information.

12.2 Defining a Constant Bit Rate (CBR) Session

With a Constant Bit Rate (CBR) session, the data travels out through the virtual circuit, then back to either the same analysis device or a different analysis device. QoSMeter measures various statistics, including the number of cells sent and received, the number whose data is good or bad, and variations in cell delay.



To define a Constant Bit Rate session, first select that type of test at the top of the General Tab, then select the operation mode you want:

- **Generation** (send tests only).
- **Analysis** (receive tests only).
- **Generation and Analysis** (send and receive tests using the same analysis device).

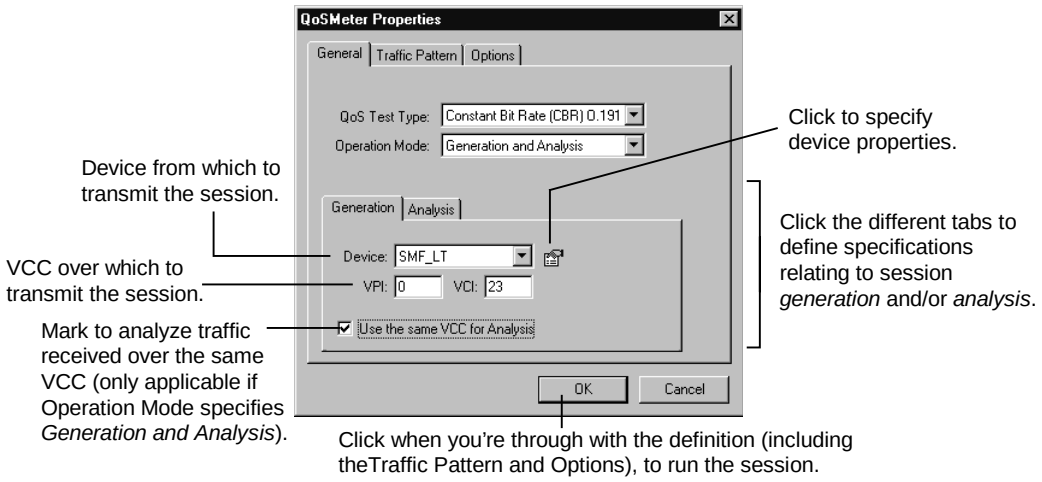
Then:

- Use the rest of the **General** tab to define general settings, separately for *generation* and *analysis* purposes (VPI/VCI, device to use, etc.).
- Use the **Traffic Pattern** tab to specify the size of your test data stream (remember that each *session* comprises one or more *tests*), the percent of bandwidth to use to transmit the test, and any background traffic you want to run simultaneously with the test data.
- Use the **Options** tab to specify various options that apply for test execution and/or analysis. For example, on the *execution* side, you'll use this tab to specify the number of times to transmit the test, and the interval between the start of one test and the start of the next test. On the analysis side, you'll use it to specify such limits as the CDV tolerance.

The sections that follow detail these tabs further. When you're through with all three tabs, click **OK** to start the session.

General Tab Settings

The General tab looks like this:



If you haven't already done so, use the area at the top to specify the:

- Type of session (CBR in this case).
- Mode of operation: **Generation**, **Analysis**, or **Generation and Analysis**, as described on page 188.

Then fill in the generation and analysis specifications, as described below.

Generation Settings

For *Generation* and *Generation and Analysis*-type sessions, click the Generation tab and specify the:

- Device from which to transmit the session traffic.

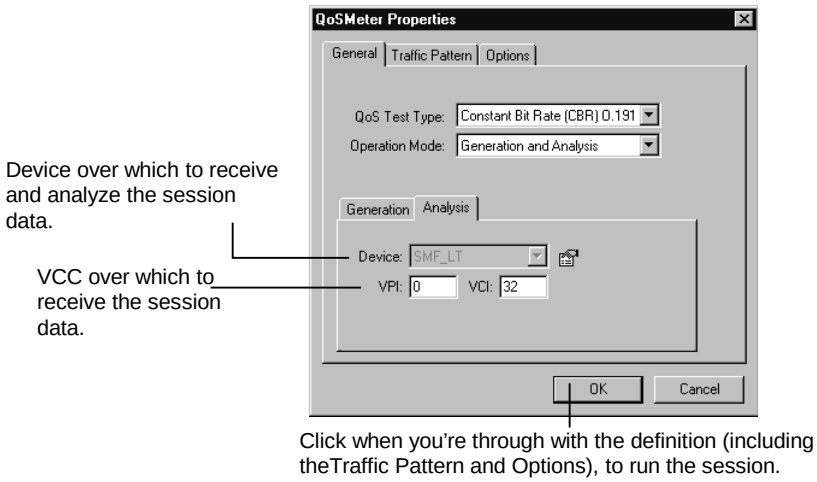
  If you want to configure the device, click the Properties button to the right of this drop-down list. If you're transmitting test data, the device must be configured for end-station mode. You might also use this feature to define the type of framing to use (SONET vs. SDH, etc.), or other settings appropriate to the type of device you're using. Refer to Chapter 4 for instructions to configure the device, as necessary.

- VPI/VCI over which to transmit the session.
- Whether to use the same VPI/VCI for analysis (applicable only in *Generation and Analysis* mode). Mark the check box to analyze session

traffic coming in over the same VCC as the one you're using to transmit; otherwise (to use a different VCC), unmark the check box.

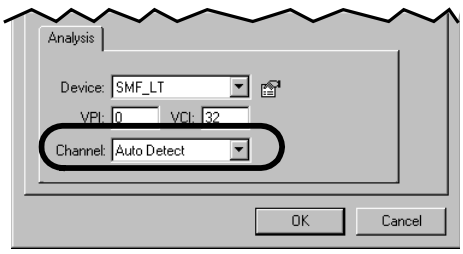
If you mark this box, QoSMeter disables all fields on the Analysis tab (described next).

Analysis Settings



For *Analysis* and *Generation and Analysis* type sessions, click the Analysis tab and specify the following information. *If you marked the **Use the Same VCC for Analysis** box in the Generation tab, these fields are pre-filled and cannot be changed.*

- Device on which to receive and analyze session data. For *Generation and Analysis* mode, this field is disabled and always specifies the sending device.
- VPI/VCI over which to receive the incoming session data.
- If you're running in *Analysis* mode only (vs. *Generation and Analysis*), there's one additional field:

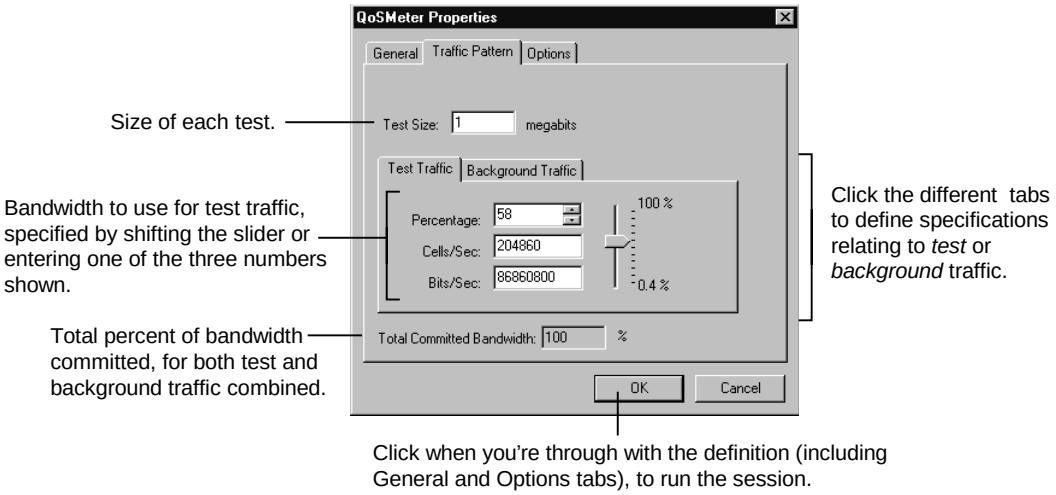


Use this field to specify the channel over which to receive the incoming data:

Selection	Receives Data Over…
1	Channel 1.
2	Channel 2.
Auto Detect	Channel determined automatically by the analysis device.

Traffic Pattern Settings

The Traffic Pattern tab looks like this:

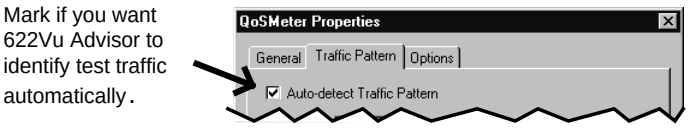


Use the area at the top to specify the maximum size of the test, in the range 1–49 megabits (where 49 Mb corresponds to 127,604 cells). Then fill in the test and background traffic specifications, respectively to define the bandwidth committed to *test* and *background* traffic. The analysis device calculates session results based only on the test traffic, and the Test Size refers to the traffic transmitted via the bandwidth assigned for test traffic. Any background traffic you define simply adds to the load, making the test more realistic.

The field at the bottom reflects the Total Committed Bandwidth, and combines the test and background specifications.

This tab applies in *Analysis* mode as well as *Generation* mode. In *Analysis* mode (and *Generation and Analysis* mode), it tells the analysis device exactly what to expect, thus enabling QoSMeter to compile the most accurate set of statistics possible.

If you're running in *Analysis* mode only, an additional field appears at the top of this tab:



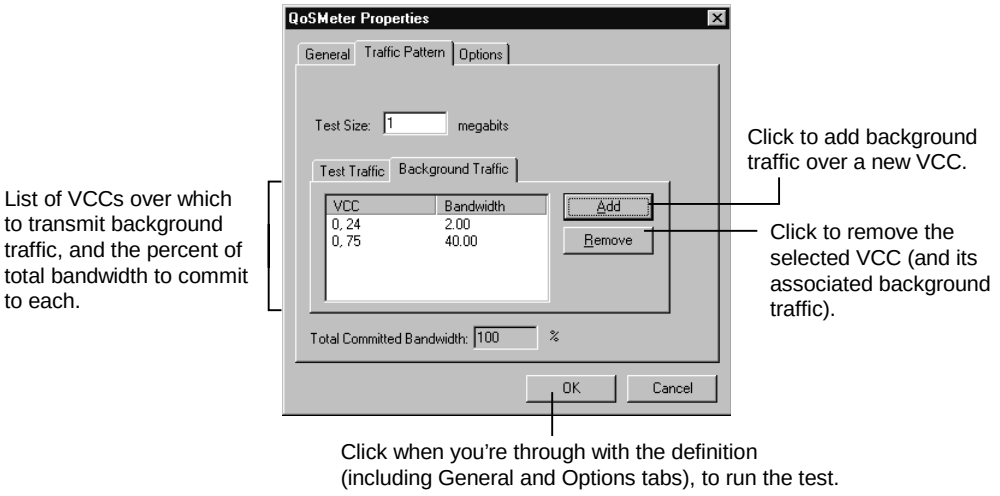
If you mark this field (it defaults to *marked*), all other fields on the tab are disabled, for both test and background information. QoSMeter *auto-detects* the test traffic in this case.

Defining Test Traffic

Click the Test Traffic tab and specify the percent of total bandwidth used to transmit the test. This, in combination with the maximum test size, determines how long each test takes to run.

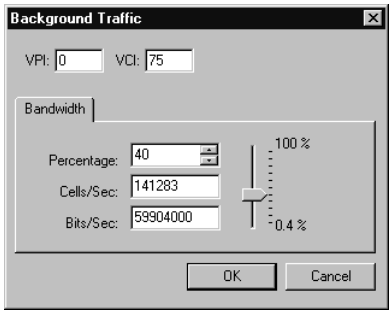
Specify the bandwidth as a percent of total available bandwidth, using either the slider (right) or one of the three fields shown (Percentage, Cells/Sec, or Bits/Sec). All numeric values are in decimal format.

Defining Background Traffic



Click the Background Traffic tab to specify any traffic you want to run simultaneously with the test data. Specify this background traffic as a percent of bandwidth to use for traffic sent over one or more specific VCCs (up to 16 VCCs total). Use the buttons to the right to add and remove VCC specifications:

- Click the **Add** button to add a new VCC. This opens the window shown to the right:



  Fill in the VPI/VCI to specify the channel over which to transmit background traffic, and the bandwidth to commit to traffic sent over that VCC. Specify the bandwidth as a percent of total available bandwidth, using either the slider (right) or one of the three fields shown (Percentage, Cells/Sec, or Bits/Sec). All numeric values are in decimal format.

- Select a VCC and click the **Remove** button to delete it.

Options

The Options panel has two tabs:

- The Execution tab applies for all modes of operation.
- The Analysis tab applies for *Analysis* mode and *Generation and Analysis* mode.

The discussion below is broken down to cover each mode of operation separately.

Generation (only) Mode Settings

When running in *Generation* mode, there is only one tab in the Options panel:

Use the **Execution tab** to specify:

- Whether to transmit the test continuously, or only a specified number of times.

The number of times to transmit the test during the session (applicable if the Continuous box is *not* checked).

- The amount of time from the start of one test to the start of the next test. If any one test takes longer than the time specified, the next test starts immediately upon its completion.

- The number of acceptable failures; that is, the number of failures after which QoSMeter should discontinue testing. This field is used for long-term testing, and refers only to internal failures on transmission.

Analysis (only) Mode Settings

When running in *Analysis* mode, both tabs in the Options panel (Execution and Analysis) establish settings used to analyze the data received. (Remember that an entirely different device is transmitting the session data.)

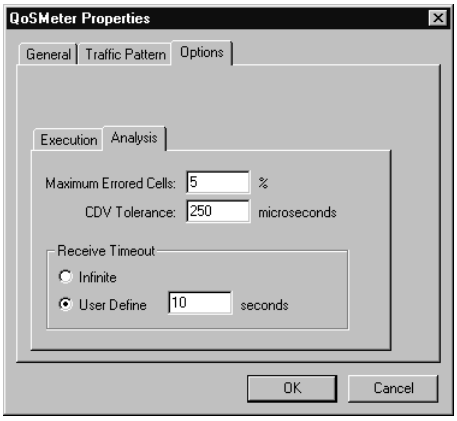
Execution Tab

Use the **Execution tab** to specify options related to the execution of the session on the analysis device.

- Whether to receive the test continuously or only a specified number of times.
- The number of tests to analyze (applicable if the Continuous box is *not* checked).
- The amount of time from the start of (receipt of) one test to the start of the next test. If a test takes longer than the specified time, the receiving device skips the next iteration of the test.
- The number of acceptable failures; that is, the number of tests for which it's acceptable to receive no data.

Note: If you're analyzing a session and see one failure after another, it's likely that the sending device hasn't started the session yet.

Analysis Tab



Use the **Analysis tab** to specify:

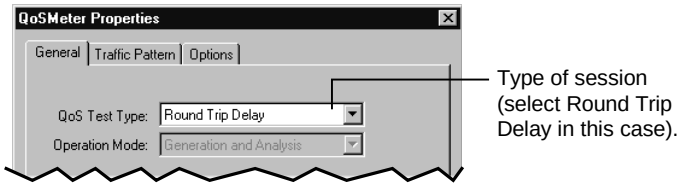
- The maximum acceptable percentage of errored cells. This is the highest percent of cells that can show up as *errored* in any single block, before the block is marked as *severely errored*. (The detailed statistics for the test include Cells Errored and Blocks Errored fields.)
- The maximum acceptable variation in cell-delay times (CDV). This is the maximum acceptable amount of delay between the arrival of any two sequential cells. If the delay exceeds the number of microseconds specified here at any point in time, the session continues to run, but the analysis device increments two statistics: Cells with Bad CDV and Late Cells.
- The maximum amount of time to wait for the arrival of the initial cells in any given test, before the session times out. Specify this time-out value either as *Infinite* (no timeout) or a number of seconds.

Generation and Analysis Mode Settings

When running in *Generation and Analysis* mode, there are two tabs in the Options panel.

- The Execution tab defines options related to execution of the session, and is specified exactly the same as the Execution tab for *Generation* (only) mode sessions. Refer to *Generation (only) Mode Settings* (page 193) for instructions to fill in this tab.
- The Analysis tab defines options related to the receipt and analysis of session data, and is specified exactly the same as the Analysis tab for *Analysis* (only) mode sessions. Refer to *Analysis Tab* (page 195), for instructions to fill in this tab.

12.3 Defining a Round-Trip Delay (RTD) Session



With a Round-Trip Delay (RTD) session, data travels from the sending device, out through the network over a preconfigured VPI/VCI, then back to the same analysis device. QoSMeter measures the latency of transmission, and provides *average*, *best*, and *worst* latency statistics.

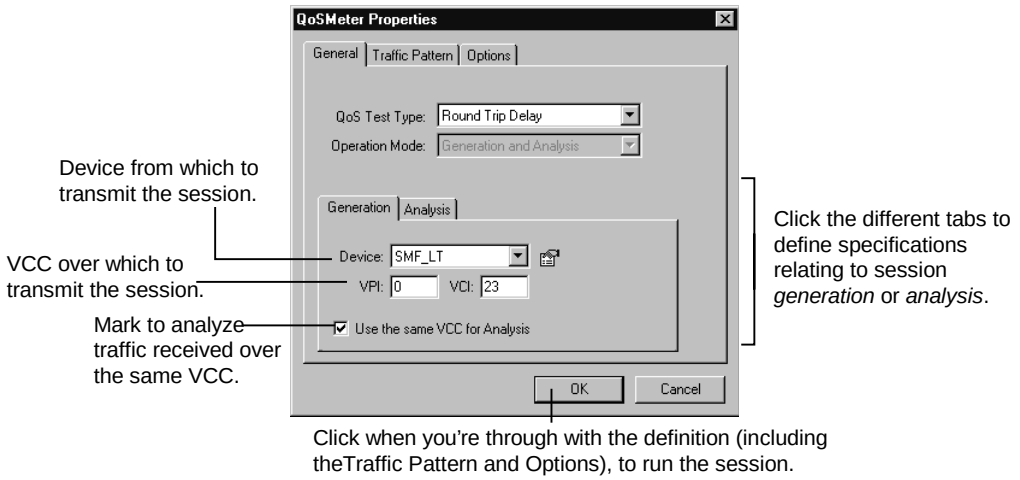
To define an RTD session, first select that type of test at the top of the General Tab. Then:

- Use the rest of the **General** tab to define general settings, separately for *generation* and *analysis* purposes (VPI/VCI, device to use, etc.).
- Use the **Traffic Pattern** tab to specify the size of your test data stream (remember that each *session* comprises one or more *tests*), the percent of bandwidth to use to transmit the test, and any background traffic you want to run simultaneously with the test data.
- Use the **Options** tab to specify various options that apply for test execution and/or analysis. For example, on the *execution* side, you'll use this tab to specify the number of times to transmit the test, and the interval between the start of one test and the start of the next test. On the analysis side, you'll use it to specify such limits as the CDV tolerance.

The sections that follow detail these tabs further. When you're through with all three tabs, click **OK** to start the session.

General Tab Settings

The General tab looks like this:



If you haven't already done so, use the area at the top to specify the type of session (Round-Trip Delay in this case). Then fill in the generation and analysis specifications, as described below.

Generation Settings

Click the Generation tab and specify the:

- Device from which to transmit the session traffic.

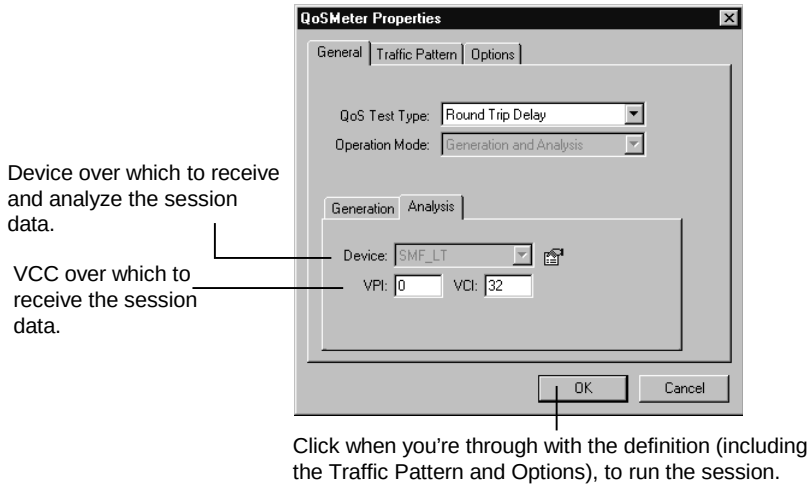
  If you want to configure the device, click the Properties button to the right of this drop-down list. The device must be configured for end-station mode (to allow it to transmit data). You might also use this feature to define the type of framing to use (SONET vs. SDH, etc.), or other settings appropriate to the type of device you're using. Refer to the Chapter 4 for instructions to configure the device, as necessary.

- VPI/VCI over which to transmit the session.

- Whether to use the same VPI/VCI for analysis. Mark the check box to analyze session traffic coming in over the same VCC as the one you're using to transmit; otherwise (to use a different VCC), unmark the check box.

  If you mark this box, QoSMeter disables all fields on the Analysis tab (described next).

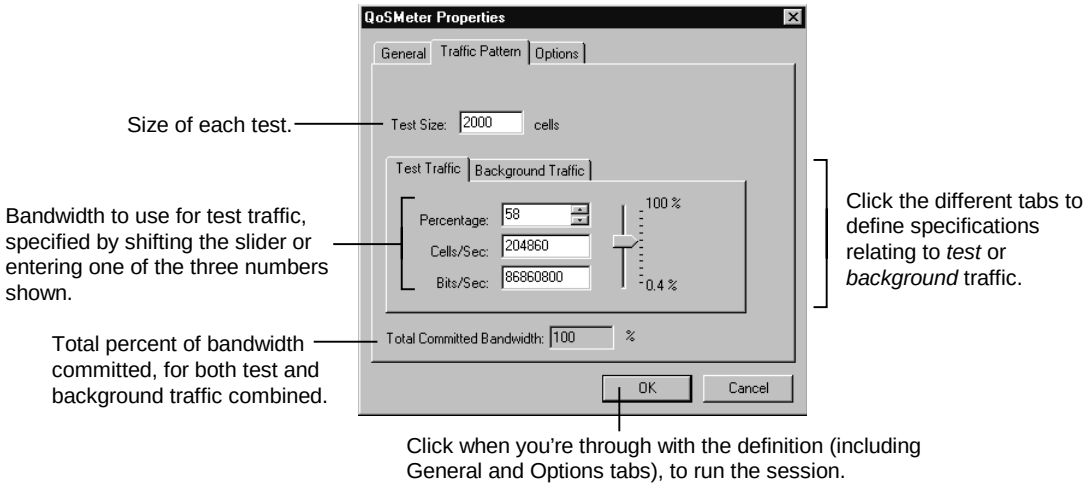
Analysis Settings



Click the Analysis tab and specify the VPI/VCI over which to receive the incoming session data. *If you marked the **Use the Same VCC for Analysis** box in the Generation tab, this field is pre-filled and cannot be changed.*

Traffic Pattern Settings

The Traffic Pattern tab looks like this:



Use the area at the top to specify the number of cells in the test, in the range 1–127,604. Then fill in the test and background traffic specifications, respectively to define the bandwidth committed to *test* and *background* traffic. The analysis

device calculates session results based only on the test traffic, and the Test Size refers to the traffic transmitted via the bandwidth assigned for test traffic. Any background traffic you define simply adds to the load, making the test more realistic.

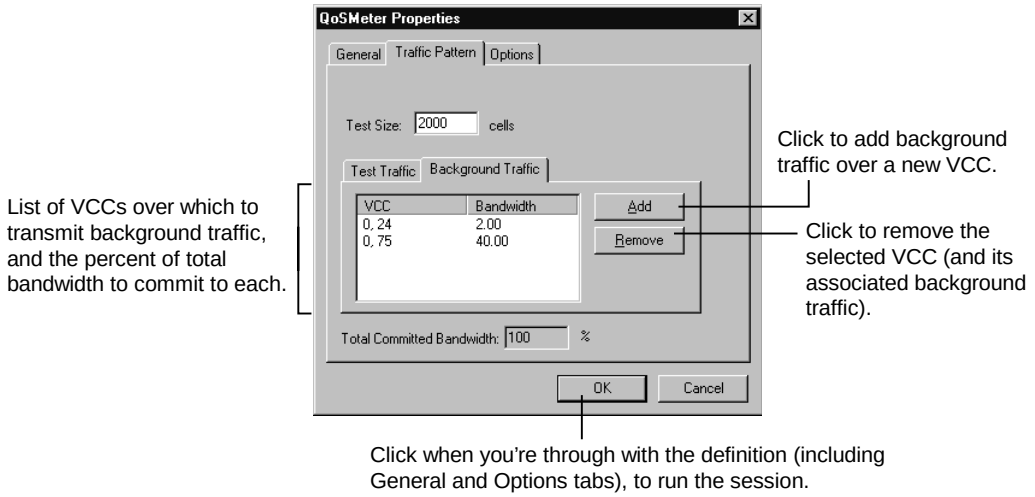
The field at the bottom reflects the Total Committed Bandwidth, and combines the test and background specifications.

Defining Test Traffic

Click the Test Traffic tab and specify the percent of total bandwidth used to transmit the test. This, in combination with the maximum test size, determines how long the test takes to run.

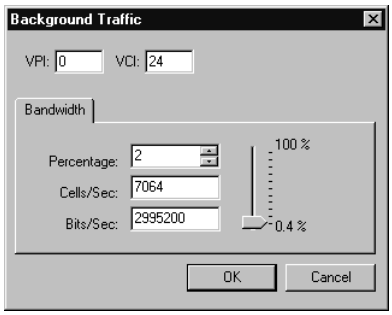
Specify the bandwidth as a percent of total available bandwidth, using either the slider (right) or one of the three fields shown (Percentage, Cells/Sec, or Bits/Sec). All numeric values are in decimal format.

Defining Background Traffic



Click the Background Traffic tab to specify any traffic you want to run simultaneously with the test data. Specify this background traffic as a percent of bandwidth to use for traffic sent over one or more specific VCCs (up to 16 VCCs total). Use the buttons to the right to add and remove VCC specifications:

- Click the **Add** button to add a new VCC. This opens the window shown to the right:



  Fill in the VPI/VCI to specify the channel over which to transmit background traffic, and the bandwidth to commit to traffic sent over that VCC. Specify the bandwidth as a percent of total available bandwidth, using either the slider (right) or one of the three fields shown (Percentage, Cells/Sec, or Bits/Sec). All numeric values are in decimal format.

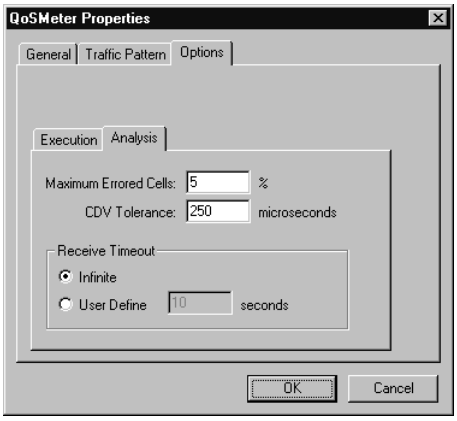
- Select a VCC and click the **Remove** button to delete it.

Options

There are two tabs in the Options panel. The Execution tab defines options related to transmission of the session, while the Analysis tab defines options related to the receipt and analysis of the session.

Use the **Execution tab** to specify:

- Whether to transmit the test data continuously, or only a specified number of times.
- The number of times to transmit the test data (applicable if the Continuous box is *not* checked).
- The amount of time from the start of one test to the start of the next test.
- The number of acceptable failures; that is, the number of failures after which QoSMeter should discontinue testing. This field is used for long-term testing, and refers only to internal failures on transmission.

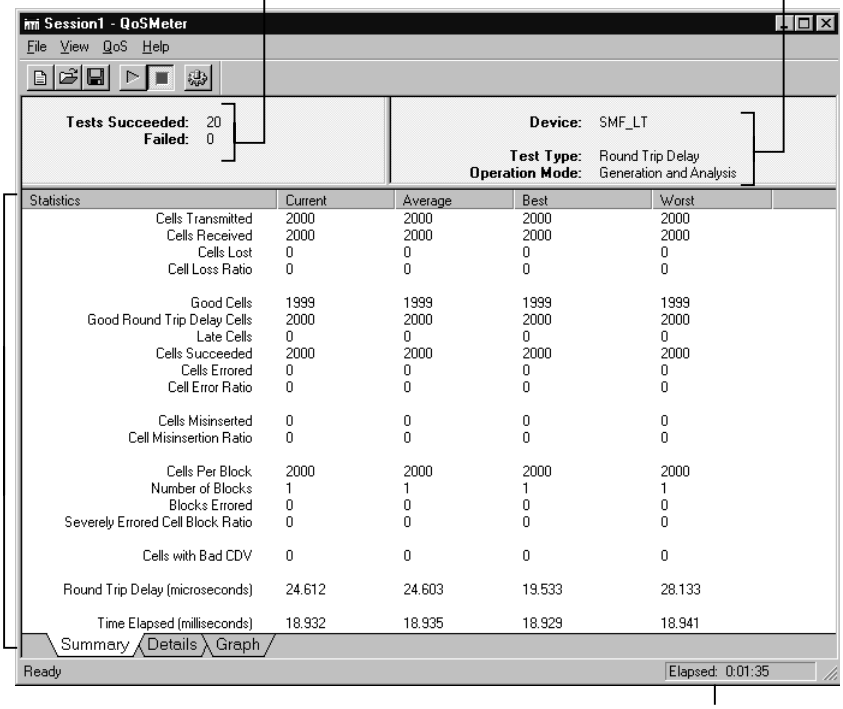


Use the **Analysis tab** to specify:

- The maximum acceptable percentage of errored cells. This is the highest percent of cells that can show up as *errored* in any single block, before the block is marked as *severely errored*. (The detailed statistics for the test include Cells Errored and Blocks Errored fields.)
- The maximum acceptable variation in cell-delay times (CDV). This is the maximum acceptable amount of delay between the arrival of any two sequential cells. If the delay exceeds the number of microseconds specified here at any point in time, the session continues to run, but the analysis device increments two statistics: Cells with Bad CDV and Late Cells.
- The maximum amount of time to wait for the arrival of the initial cells in any given test, before the session times out. Specify this time-out value either as *Infinite* (no timeout) or a number of seconds.

12.4 Running a Session

The session monitoring window looks like this (shown for a Round-Trip Delay session):



The content of this area varies depending on which tab you're on. This tab presents a summary of statistics for the current iteration of the test, with *average*, *best*, and *worst* values for each statistic shown to the right.

There are three tabs in this display. Click the one you want to see:

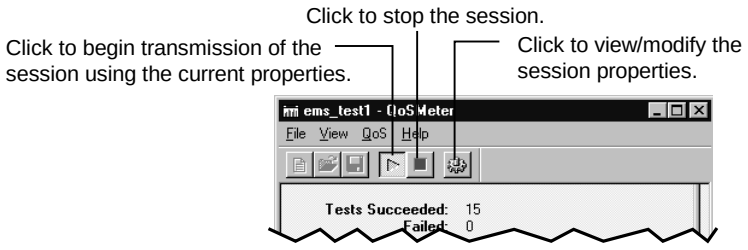
- **Summary** (illustrated above) lists the same statistics you'll see in the Details tab, but shows only the current test (left); and the *average*, *best*, and *worst* value for each statistic.
- **Details** lists every available statistic for each test: one row per test.
- **Graph** presents a bar graph showing either Cell-Delay Variation (for a CBR session) or Round-Trip Delay (for an RTD session), for one or more tests. Before selecting the Graph tab, either:

⇒ Select those tests you want to graph from the Details display, then choose **Graph Selected Tests** from the **View** menu. This results in a graph of only the selected tests, plus one set of results showing the average of all the selected tests (or, if you only select one test, the average of all tests run so far in the session). It's a good idea to disable the Auto Update Graph capability when you graph selected tests.

⇒ Choose **Auto Update Graph** from the **View** menu. This results in a graph that's revised continuously, and that has two sets of numbers: those showing the overall average of all tests, and those for the current test.

Toolbar and Menu Commands

The toolbar lets you start/stop transmission of the session, or open the dialog box used to specify the session properties. (Use of this properties dialog box is described in *Section 12.2 Defining a Constant Bit Rate (CBR) Session* (starting on page 188) and *Section 12.3 Defining a Round-Trip Delay (RTD) Session* (starting on page 196).



If you stop the session (or it ends automatically), the elapsed-time field stops counting. You can retransmit the session any number of times by simply clicking the **Start** button. The elapsed-time field resets itself after a restart, as do the statistics and graphs.

Other menu commands let you open a previously saved session, save the current session, graph displayed information, etc. Refer to page 187 for a complete list of menu and toolbar commands.

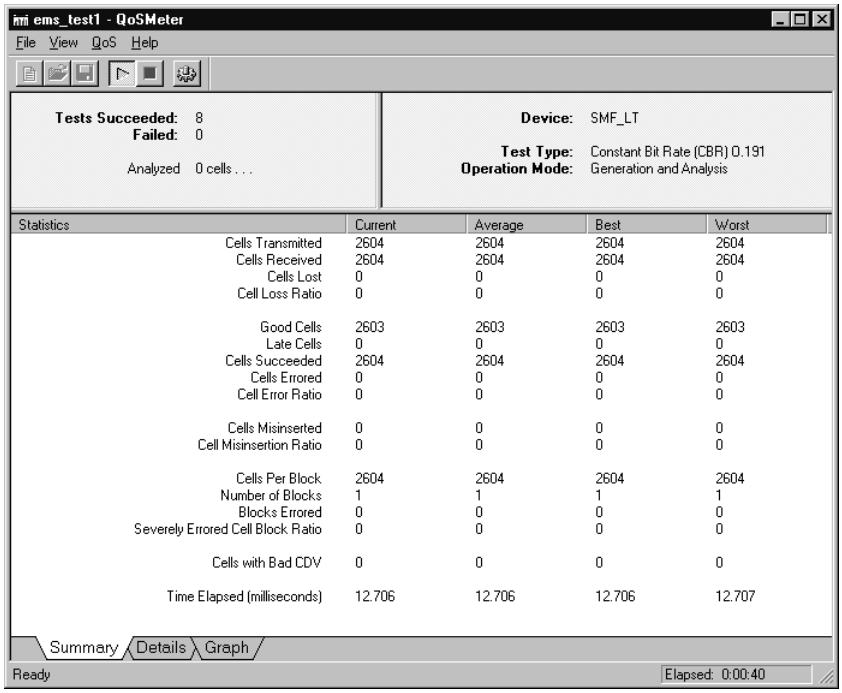
The rest of this section describes specific information available on the monitoring display, first for Constant Bit Rate sessions, then for Round-Trip Delay sessions.

Constant Bit Rate (CBR) Sessions

The following sections describe the Summary, Details, and Graph tabs for CBR sessions.

Summary Tab

The CBR Summary display gives an overview of the tests run so far:



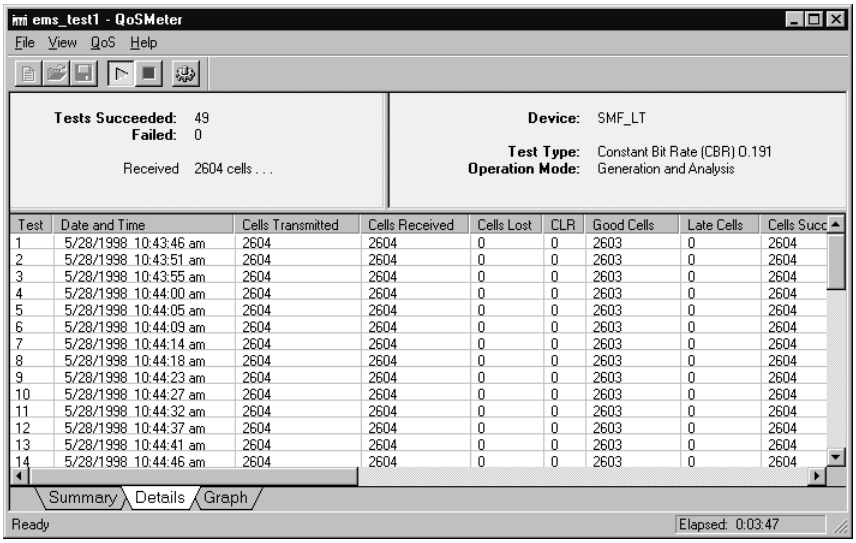
It shows the *average*, *best*, *worst*, and *current* test results for the following statistics:

Statistic	Description
Cells Transmitted	Number of cells transmitted by the test.
Cells Received	Number of cells received by the test, including errored and late cells.
Cells Lost	Number of cells transmitted but not received.
Cell Loss Ratio	Ratio of Cells Lost / Cells Transmitted.
Good Cells	Number of cells arriving on time (i.e., within the specified CDV) and with good data (i.e., having a good CRC (checksum) and arriving in sequence).
Late Cells	Number of cells received late (can include errored cells). This is the number of cells that exceeded the CDV Tolerance specified in the session properties (Options tab).

Statistic	Description
Cells Succeeded	Number of non-errored cells received by the test (can include late cells).
Cells Errored	Number of cells arriving with a bad CRC (checksum).
Cell Error Ratio	Ratio of Cells Errored / Cells Received.
Cells Misinserted	Number of times a cell arrived in an unexpected sequence.
Cell Misinsertion Ratio	Ratio of Cells Misinserted / Cells Transmitted.
Cells Per Block	Number of cells in each block.
Number of Blocks	Number of blocks received.
Blocks Errored	Number of blocks for which the percent of errored cells exceeded the Maximum Errored Cells percentage specified on the Options tab.
Severely Errored Cell Block Ratio	Ratio of Blocks Errored / Number of Blocks.
Cells with Bad CDV	Number of cells for which the arrival time exceeded the CDV Tolerance specified (Options tab, Analysis settings) by the test properties *in either direction* (i.e., making the cell either too early or too late).
Time Elapsed	Elapsed time from the start of the test to completion of the test, in milliseconds.

Details Tab

The CBR Details tab looks like this:

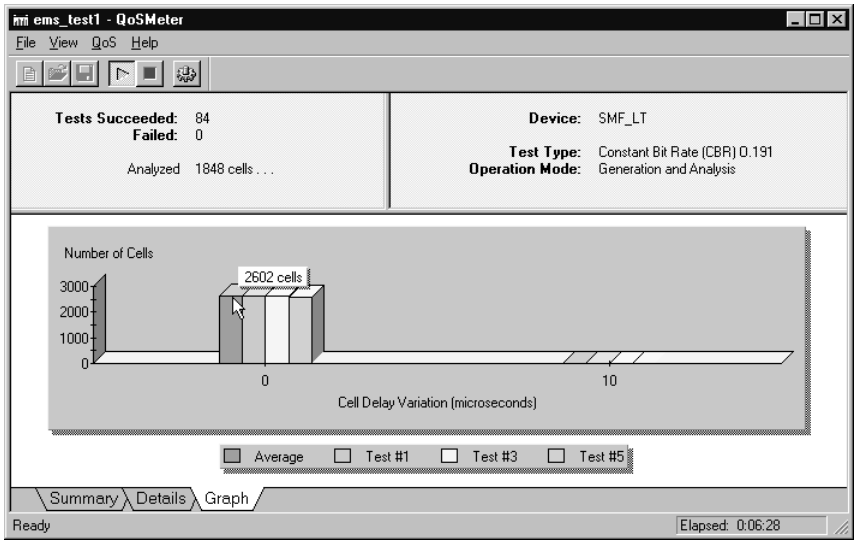


It includes one line for each test, for the most recent execution of the session. The left-most two columns identify the test (Test column), and the date/time the first data was received for that test (Date and Time column). The remaining

columns show the same statistics (in the same order) as described for the Summary tab. These statistics are described starting on page 204.

Graph Tab

The Graph looks like this for a CBR session:



Each different color corresponds to a single test, with the left-most bar (within each set) showing the average for all tests shown. In this example, of the 2,604 cells transmitted by each test, approximately 2600 had a CDV of zero microseconds, and the rest had a CDV of 10 microseconds.

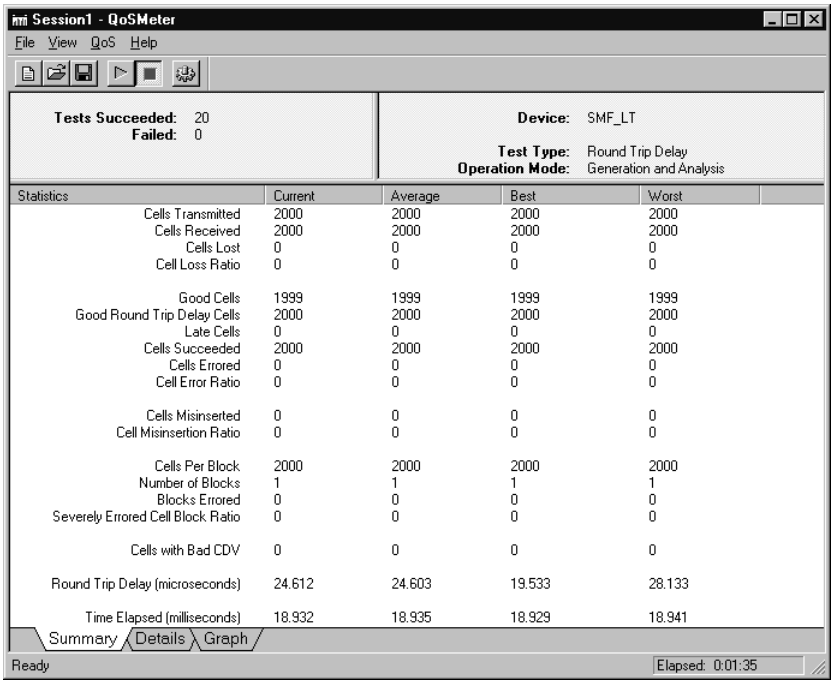
You can display the exact number of cells that fall into each category for a specific test, by positioning the mouse on the corresponding column. This is illustrated above for the Average column to the left.

Round-Trip Delay (RTD) Sessions

The following sections describe the Summary, Details, and Graph tabs for Round-Trip Delay sessions.

Summary Tab

The Round-Trip Delay Summary display gives an overview of the tests run so far:



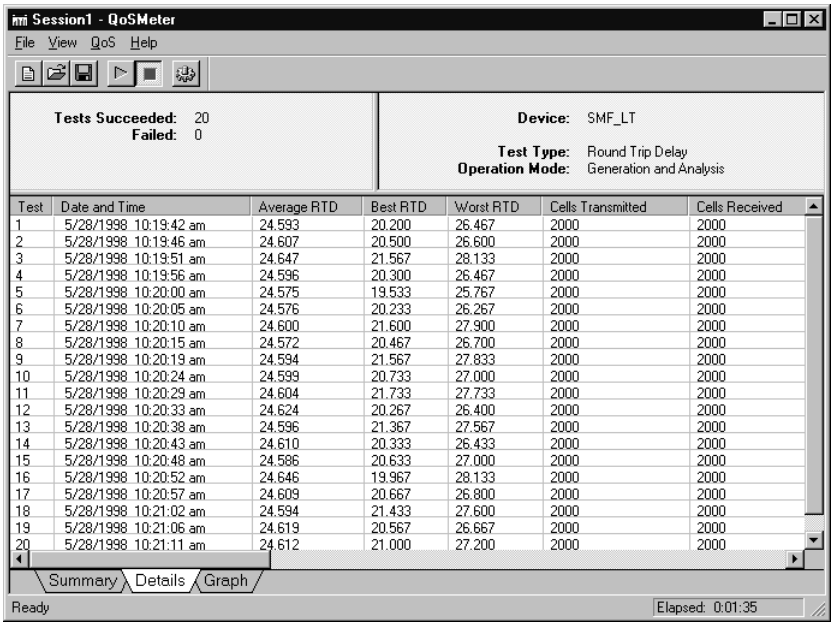
It shows the *average*, *best*, *worst*, and *current* test results for the following statistics:

Statistic	Description
Cells Transmitted	Number of cells transmitted by the test.
Cells Received	Number of cells received by the test, including errored and late cells.
Cells Lost	Number of cells transmitted but not received.
Cell Loss Ratio	Ratio of Cells Lost / Cells Transmitted.
Good Cells	Number of cells arriving on time (i.e., within the specified CDV) and with good data (i.e., having a good CRC (checksum) and arriving in sequence).
Good Round Trip Delay	Number of cells arriving that pass these tests:

Statistic	Description
Cells	• CRC (cell contains good data). • unscrambling (unscrambled successfully). • integrity (cell retains its original signature after unscrambling).
Late Cells	Number of cells received late (can include errored cells). This is the number of cells that exceeded the CDV Tolerance specified in the session properties (Options tab).
Cells Succeeded	Number of non-errored cells received by the test (can include late cells).
Cells Errored	Number of cells arriving with a bad CRC (checksum).
Cell Error Ratio	Ratio of Cells Errored / Cells Received.
Cells Misinserted	Number of times a cell arrived in an unexpected sequence.
Cell Misinsertion Ratio	Ratio of Cells Misinserted / Cells Transmitted.
Cells Per Block	Number of cells in each block.
Number of Blocks	Number of blocks received.
Blocks Errored	Number of blocks for which the percent of errored cells exceeded the Maximum Errored Cells percentage specified on the Options tab.
Severely Errored Cell Block Ratio	Ratio of Blocks Errored / Number of Blocks.
Cells with Bad CDV	Number of cells for which the arrival time exceeded the CDV Tolerance specified (Options tab, Analysis settings) by the test properties *in either direction* (i.e., making the cell either too early or too late).
Round-Trip Delay (microseconds)	Round-trip delay, in microseconds.
Time Elapsed	Elapsed time from the start of the test to completion of the test, in milliseconds.

Details Tab

The Round-Trip Delay Details tab looks like this:



Test	Date and Time	Average RTD	Best RTD	Worst RTD	Cells Transmitted	Cells Received
1	5/28/1998 10:19:42 am	24.593	20.200	26.467	2000	2000
2	5/28/1998 10:19:46 am	24.607	20.500	26.600	2000	2000
3	5/28/1998 10:19:51 am	24.647	21.567	28.133	2000	2000
4	5/28/1998 10:19:56 am	24.596	20.300	26.467	2000	2000
5	5/28/1998 10:20:00 am	24.575	19.533	25.767	2000	2000
6	5/28/1998 10:20:05 am	24.576	20.233	26.267	2000	2000
7	5/28/1998 10:20:10 am	24.600	21.600	27.900	2000	2000
8	5/28/1998 10:20:15 am	24.572	20.467	26.700	2000	2000
9	5/28/1998 10:20:19 am	24.594	21.567	27.833	2000	2000
10	5/28/1998 10:20:24 am	24.599	20.733	27.000	2000	2000
11	5/28/1998 10:20:29 am	24.604	21.733	27.733	2000	2000
12	5/28/1998 10:20:33 am	24.624	20.267	26.400	2000	2000
13	5/28/1998 10:20:38 am	24.596	21.367	27.567	2000	2000
14	5/28/1998 10:20:43 am	24.610	20.333	26.433	2000	2000
15	5/28/1998 10:20:48 am	24.586	20.633	27.000	2000	2000
16	5/28/1998 10:20:52 am	24.646	19.967	28.133	2000	2000
17	5/28/1998 10:20:57 am	24.609	20.667	26.800	2000	2000
18	5/28/1998 10:21:02 am	24.594	21.433	27.600	2000	2000
19	5/28/1998 10:21:06 am	24.619	20.567	26.667	2000	2000
20	5/28/1998 10:21:11 am	24.612	21.000	27.200	2000	2000

It shows one line for each test, for the most recent execution of the session. The first five columns are described below.

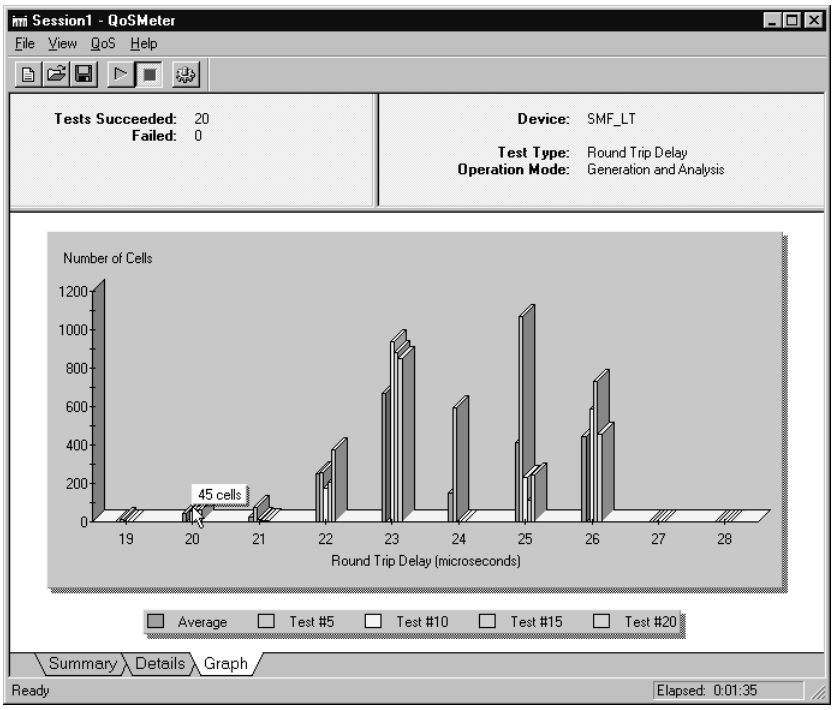
Statistic	Description
Test	Number to identify this test within the session.
Date and Time	Date and time the first data was received for this test.
Average RTD	Average round-trip delay for all cells received (in microseconds).
Best RTD	Lowest round-trip delay for all cells received (in microseconds).
Worst RTD	Highest round-trip delay for all cells received (in microseconds).

The remaining columns show the same statistics (in the same order) as described for the Summary tab, with one exception: there's no Round-Trip Delay field in the Details tab. (This field is replaced by the three Round-Trip Delay fields described above.)

Refer to page 207 for a detailed description of these statistics.

Graph Tab

The Graph looks like this for a Round-Trip Delay session:



Each different color corresponds to a test, with the left-most bar (within each set) showing the average for all tests shown. Here we're looking at four different tests. All 2,000 cells transmitted by those tests had a Round Trip Delay in the range 19 – 28, with most showing an RTD of 23 or 26.

You can display the exact number of cells that fall into each category for a specific test, by positioning the mouse on the corresponding column (illustrated above for Test 15 in the 20-microsecond RTD columns).

Appendix A
Glossary

622Vu Advisor The user interface to the CellCommand OLE Automation server. This interface program provides all the capabilities outlined in this Agilent *622Vu Advisor User's Guide*.

622Vu Undercradle The Agilent Advisor undercradle analysis device. Comprises the logic used to send, receive, and analyze ATM traffic as directed by your scripts, *ping* messages, and QoSMeter sessions.

AAL See *ATM Adaptation Layer*.

Adaptation Layer See *ATM Adaptation Layer*.

Arrival Time Applies to the capture window. Format is *hh*:*mm*:*ss*.*nnnnnnnn*, shown to a resolution of 33 ns. Initially displays relative to the start of the capture, but can be changed via the **View** menu, to display a delta time between cells; or via the **Edit** menu, to establish a particular cell as a baseline from which all other (relative) times are measured.

ATM Asynchronous Transfer Mode — Group of communications protocols that support a wide range of bit rates using a form of cell networking that transmits data in 53-byte cells. ATM allows integration of voice, data, and video transmissions, and is the most widely studied form of cell networking. It was initially developed by the CCITT and its successor, the ITU, as the underlying form of transmission for B-ISDN. Subsequently, a group called the ATM Forum has taken over some of the ATM design in an effort to provide standards that were lacking in the CCITT version.

In this context, the term *asynchronous* refers to the fact that cells from any one source don't have to be spaced (within the data stream) at a set position within a recurring frame (as is common in circuit switching).

ATM Adaptation Layer Layer of ATM protocols responsible for packaging data into cells, then reassembling it at the receiving end — that is, for adapting datagrams, voice samples, and video frames into a format that can be handled by ATM. The individual protocols used in this layer are referred to as AALs. As specified by the ITU, there are currently four AALs used to package and reassemble normal traffic:

- AAL1 supports connection-oriented services that require a constant bit rate, and have specific timing and delay requirements.
- AAL2 supports connection-oriented services that don't require a constant bit rate; i.e., variable bit-rate services such as some video schemes.
- AAL3/4 supports variable bit-rate transmissions that don't require a bounded delay from source to destination (connectionless and connection-oriented).
- AAL5 is a simpler (and connection-oriented) version of AAL 3/4, suitable for most data transmissions. Its simplicity comes at the expense of automatic error recovery and built-in retransmission.

The ATM Forum is working on AAL 6, which will support a specific type of video-stream transmission known as MPEG2.

Each AAL is divided into two parts: an SAR (*Segmentation and Reassembly*) sublayer and a *Convergence Sublayer* (which itself comprises two separate sublayers). Beyond this brief

explanation, the specifics of these protocols are outside the scope of this manual; suffice it to say that Agilent Technologies complies with the latest AAL standards.

ATM Forum Worldwide organization, founded in 1991 for the purpose of promoting ATM within the industry and the end-user community. The ATM Forum has taken over some of the ATM design from the ITU (formerly the CCITT), in an effort to provide standards that were lacking. The ATM Forum has grown tremendously, and now includes a large assortment of communications and computer industries, government agencies, resource centers, and private users.

BadHec buffer Applicable with filtersets defined as using filter entries. Required buffer used to store cells detected as having a bad HEC. (There can be up to 1023 additional buffers.) You can't specify filter entries for a BadHec buffer, although you can change its buffer-level settings to restrict the size of the buffer, for example, or to control whether the buffer wraps when it's full.

bandwidth Capacity of a circuit to carry data, generally measured in bits-per-second (bps) for digital circuits. The analysis device drives its connection to the ATM device at full bandwidth (which varies depending on the type of physical connection used).

bps Bits per second (speed of data transfer).

buffer See *filter buffer*.

capture Feature of 622Vu Advisor that lets you actually capture the traffic that comes in over one or both channels of an analysis device, optionally saving the captured traffic on your PC. You might save a capture to review or process it later, or you may want to use the capture as a *script* (or as the basis for a script). Once you create a capture file, you can generate subsets of that file, as necessary to accommodate your testing.

622Vu Advisor lets you limit the traffic you capture (generally to save storage). You do this by filtering the capture based on VCC, IP address, decode, or incoming channel. You can also use filters to control the way in which the traffic is captured (using a single buffer that wraps, using several different buffers that don't wrap, etc.).

There are three ways to define a filter: through 622Vu Advisor's standard filterset processor (detailed in Chapter **8**), while monitoring real-time statistics (detailed in Chapter **7**), or using the capture facility's filterset wizard (described in Chapter 6). In the latter two cases (real-time stats and filterset wizard), you have the option of saving the filter definition, or discarding it after a single use. The approaches offer slightly different filtering capabilities, as described in Table 3 (page 79).

CaptureAll buffer The only buffer used when capturing traffic with a filterset that is defined as capturing *everything*. You can't specify filter entries for a CaptureAll buffer, but you can control its size and wrapping, and whether it captures idle cells or not.

CCITT Comité Consultatif International Télégraphique et Téléphonique (or Consultative Committee on International Telephone & Telegraph) — a committee initially designed to develop international telephony (voice communications) standards, but whose responsibilities evolved to include broader standards for communications equipment (equipment interfaces, communications protocols, modem functions, etc.). The CCITT has been replaced recently by the International Telecommunications Union (ITU). Many standards introduced by the CCITT (and subsequently taken over by the ITU) are still considered CCITT standards. The ATM standards are among these.

cell For purposes of 622Vu Advisor, a single 53-byte ATM cell comprising 5 header bytes and 48 bytes of data.

CellCommand The OLE Automation Server that drives 622Vu Advisor's host-side processing. 622Vu Advisor is one of several Windows applications you can use to pass requests to the analysis device. The mechanism used to communicate between these applications and the

analysis device is known as OLE Automation. This mechanism, developed by Microsoft, uses state-of-the-art technology to ensure complete control over processing as well as efficient data transfer.

You'll use CellCommand to define transmit sequences (sets of cells), scripts, and QoSMeter tests; and to translate these definitions into direct function calls to the analysis device's device driver. CellCommand is the only vehicle by which other Windows applications can pass instructions or data to and from the analysis devices; i.e., it's the only code that can access the analysis device's device driver.

CellCommand is implemented as:

- **an OLE 2 in-process server**, meaning that it's responsible for the complete implementation of its objects. Automation clients can get everything they need from the DLL, without going through another DLL.
- **an OLE 2 Automation object**, allowing other applications (Visual Basic and C++ for example) to dynamically discover and use its interfaces at run time. This provides a form of late binding to the interfaces, allowing each CellCommand object to describe its capabilities to any tool dynamically, while letting that tool control the programming environment — language, vendor, functions enabled, etc.

cell header See *header*.

cell library Repository for various 622Vu Advisor information: sequence definitions, script definitions, filterset definitions, QoSMeter test session definitions, etc. 622Vu Advisor can manage any number of cell libraries, but only one library is open (*active*) at any given time. Any changes made during processing are saved in the active cell library immediately.

All 622Vu Advisor processing requires that you have an active cell library. Each library is a complete entity, containing all the sequence and script definitions, filter buffers, filter entries, etc., which are used together during processing. (Only two types of information are stored outside of the cell library, both for processing efficiency: profile definitions and cell captures.)

622Vu Advisor is distributed with several libraries, as detailed in Appendix **C**. Within a given cell library there are several distinct directories (one to store sequences, one to store scripts, etc.). Refer to Appendix **D** for a description of the library structure.

Cell Loss Priority See *CLP*.

cell name Name assigned to a particular cell, to identify it within its parent sequence.

cell networking Technology involved in transmitting all data in small, fixed-length packets (cells). With cell networking, a sender breaks a data packet into cells before transmitting it across the network to the receiver. The receiver takes the cells and reassembles them to form the packet. Cell networking is also known as *cell switching* or *cell relay*.

The most common form of cell networking calls for 53-byte cells comprising a 5-byte header and 48 bytes of data. This is the size required by the ITU's ATM standards.

cell property Characteristics of a cell that are either *defined* or *undefined* at each of the cell and/or sequence levels, but that are always considered defined at the script level. These characteristics include:

GFC — Generic Flow Control.

VPI — Virtual Path ID.

VCI — Virtual Channel ID.

PTI — Payload Type Indicator.

CLP — Cell Loss Priority.

Force-HEC-state property — Indication of whether to force a HEC value before cell transmission.

If a property is undefined at a particular level, its value is inherited from the containing object:

- A property that's undefined in a cell definition is inherited from the containing *sequence* (if defined there) or *script* (if not defined at the sequence level).
- A property that's undefined in a sequence definition is inherited from the containing script (then propagates down to any cells for which the property is undefined).

channel Connection between two hosts. A channel must be established before ATM cells can be transmitted from one host to another.

channel identifier 28-bit identifier comprising a Virtual Path Identifier (VPI) and a Virtual Channel Identifier (VCI). Each ATM connection has one channel identifier, which is carried in the cell header. While the small size of this identifier makes hop-by-hop routing efficient, it also means that you can't use the identifier throughout the entire ATM network; 28 bits is simply not large enough to guarantee a unique channel identifier across this ATM network. (By comparison, ISO addresses range up to 160 bits in order to guarantee uniqueness.)

ATM technology solves this problem by making the channel identifier dynamic from one hop to the next, but static for any particular hop, and unique across all connections managed by the two devices at either end of that hop. When the signalling software first sets up a channel (which happens before the first cell is sent through that channel), the two devices involved in each hop determine a VPI/VCI setting that can be used for that hop. Each device, then, needs to know the incoming VPI/VCI (the channel identifier agreed upon with the previous device in the network) and the outgoing VPI/VCI (the channel identifier agreed upon with the next device in the network). When it receives a cell, the device uses the incoming VPI/VCI values as simple indexes into a routing table to determine the outgoing VPI/VCI values. Then it changes the identifiers before forwarding the cell.

Transmissions between the high-level provider networks (known as the ATM backbone networks) typically only look at the VPI to route the cell correctly. Very few (high-speed, broadband) trunk links are needed to connect any one backbone device to its neighboring devices, and the VPI contains sufficient information to forward the cell correctly between these links. Backbone networks that can route based only on the VPI only change the VPI before forwarding the cell, effectively using an even smaller channel identifier than those that need both the VPI and VCI.

Transmissions at the periphery of the ATM network — near the lowest-level connections (to individual users or offices, for example) — generally require routing based on the VCI as well as the VPI.

CLP Cell Loss Priority — A one-bit cell-header field that, when set, indicates to the devices in the ATM network that this cell can be dropped, if necessary, during periods of congestion. Cells for which the CLP is set will be dropped before cells having a zero value in the CLP. There are two ways the CLP can be set:

- By the sender, in cells used to fill up the bandwidth reserved for a connection. Because each ATM connection can have a guaranteed bandwidth, it's important (for the sake of efficiency) to use that bandwidth, even if the essential traffic doesn't always fill it. By loading extra traffic into the network, the sender can make use of the full bandwidth; but by setting the CLP in the cells that carry that extra traffic, the sender can arrange for it to be dropped before it interferes with essential traffic.
- By the ATM network, if it detects the situation where the sender reserved less bandwidth than is being used — for example, by asking for a 2 Mb/s connection then sending at 2.5 Mb/s. In this case, the ATM standards allows for setting of the CLP bit in as many cells as needed to reduce the priority (CLP = 1) traffic to the reserved amount.

config.ini .ini file used by 622Vu Advisor to configure the system at startup, and to determine various processing preferences.

configuration #5 One of the possible configurations you can establish for a full-end station analysis device, wherein incoming traffic on Channel 1 goes into the framer chip on the analysis device and is monitored by 622Vu Advisor (and optionally captured). The analysis device transmits traffic over Channel 1. This is the *normal* way to connect to a physical ATM link in end-station mode, when capturing/transmitting on Channel 1. Incoming traffic on Channel 2 loops out over Channel 2 without being monitored.

configuration #6 One of the possible configurations you can establish for a full-end station analysis device, wherein incoming traffic on Channel 1 loops out over Channel 1 without being monitored. Incoming traffic on Channel 2 goes into the framer chip on the analysis device and is monitored by 622Vu Advisor (and optionally captured). The analysis device transmits traffic over Channel 2. This is the *normal* way to connect to a physical ATM link in end-station mode, when capturing/transmitting on Channel 2.

configuration #10 One of the possible configurations you can establish for an analysis device, and always used for a monitor-only device. With this configuration, 622Vu Advisor automatically monitors the traffic coming in both channels, and retransmits all traffic over the opposite channel from where it's received.

connection-oriented A term referring to the characteristic of ATM that requires an established connection (*channel*) before a cell can be sent. This minimizes the overhead involved in routing traffic from one point to another, because each hop in the transmission only has to remember how to get to the next point.

Convergence Sublayer (CS) One of two sublayers in each AAL (ATM Adaptation Layer protocol), as currently specified by the ITU. The Convergence Sublayer is responsible for managing the flow of data to and from the Segmentation and Reassembly sublayer. (Looking one step further, the CS actually comprises two component parts: the Common Part Convergence Sublayer and the Service Specific Convergence sublayer. The specifics of these sublayers are not detailed in this glossary.) See *ATM Adaptation Layer* for more information.

CRC Cyclical Redundancy Check — Group of closely related mathematical algorithms used to detect errors in a stream of bits. The HEC (Header Error Control) computation is a form of CRC, and verifies correct transmission of cell-data. The PDU uses another form of CRC (this in addition to the CRC (HEC) for each cell), but the specifics of this vary depending on the type of PDU being sent.

To illustrate, the CRC formula used for an AAL3/4 stream is different from an AAL5: in AAL3/4, each cell payload has its own CRC, but in AAL5 only the last cell has a CRC, which checks the entire PDU contents.

CS See *Convergence Sublayer*.

datagram One packet of information that's routed through a network, including both the data being passed from one host to another and the information necessary to deliver that data safely.

Device Manager Component of 622Vu Advisor that lets you configure analysis devices, and/or monitor the physical interface between an analysis device and the ATM device under test.

DLL Dynamic Link Library — A Microsoft Windows term referring to a support library for a product or product set.

DS data rate Digital Signal data rate: a term referring to the rate of data transmission of a bit stream across COAX cable (copper wire). Agilent Technologies offers physical-interface options that support DS3 (44.7362 Mb/s) and DS1 (T1).

end-station mode One of two ways you can configure an analysis device (contrast *monitor mode*). In end-station mode, the 622Vu Advisor is a known, visible end station on the

network, capable of transmitting ATM cells and *ping* messages, as well as monitoring and capturing traffic as it's received.

fiber optics A type of signalling equipment capable of transmitting data through optical fiber very fast (up to several Gb per second) over long distances, with low error rates. Fiber-optic cable provides a high bandwidth through which data is transmitted by modulating a light wave through a specially engineered plastic or glass fiber. Fiber optics have made *gigabit networks* possible.

filter buffer Subdivision of a filterset that's used to store one or more types of cells during capture processing, where each type of cell is defined via a separate filter entry. Each buffer corresponds to a particular division of capture memory on the analysis device, and is assigned a percentage of the total available capture memory. You can divide capture memory evenly across all buffers, or specify a certain percent of the available memory per buffer.

All the cells stored in the various buffers are combined and sorted (by arrival time) before being displayed; the assignment of buffers through filtering has no effect on the capture display.

filter entry Lowest-level component within a filterset. There can be one or more filter entries in each filter buffer. There's a separate filter entry for each different type of cell you want to capture in that buffer, and that entry provides specific instructions to 622Vu Advisor as to the characteristics of the cell(s) you want to save (specific VCCs, specific GFC values, etc.).

filterset Set of specifications that identify characteristics of the cells you want to keep during capture processing. Each capture can use, at most, one and only one filterset. Each filterset is defined as either capturing *everything* (i.e., all traffic), or as using *filter entries*. Each filterset divides the analysis device's memory into receive areas (called *filter buffers*), and specifies what type(s) of cells should go into each area (via *filter entries*). A capture-*everything* filterset has one buffer (CaptureAll).

Filtersets defined as using filter entries always have a buffer (BadHec) used to store cells having a bad HEC, and can have any number of additional buffers, each with its own definition of content. You can define how much memory to use for each buffer, and whether to wrap buffer space. You also indicate whether or not to capture idle cells at the filterset level.

firmware Software running on the analysis device, used to drive its processing.

force-HEC-state property Property of a cell that indicates whether to force a certain HEC value before cell transmission.

Gb Gigabit — Unit of measure generally used to specify the capacity (transmission rate) of a connection to carry data; specifically, 1^9 (one billion) bits.

GB Gigabyte — Unit of measure generally used to specify memory or disk-storage capacity; specifically, 1^9 (one billion) bytes.

General Switching Management Protocol See *GSMP*.

Generic Flow Control See *GFC*.

GFC Generic Flow Control. Four-bit field that's carried in the cell header for purposes of flow control; that is, to determine how to multiplex the current cell with cells of other ATM connections transmitted across a shared-access network. The specifics of this field are still undefined; in fact, the logic of using these four bits for juggling priorities among ATM connections is still being questioned. Currently the GFC is always zeros. Regardless of its final specifications, the GFC's value will only have local significance, and will be overwritten in ATM devices, as necessary.

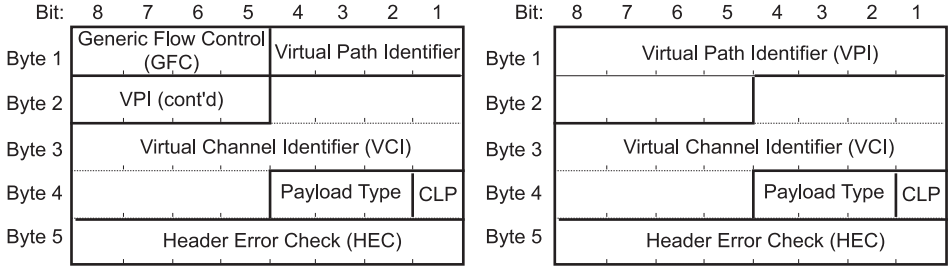
gigabit networks Networks capable of transmitting at speeds of one Gb per second or faster. Refers to the term *gigabit environment*, introduced by Craig Partridge in his book "Gigabit Networking" [1994 Addison-Wesley Publishing Company] to refer to "a computing milieu in

which most of all of the components of a computer system are processing, storing, displaying, or moving data at speeds exceeding 1 gigabit per second."

GRC Generic Reference Configuration.

GSMP General Switching Management Protocol — A general-purpose protocol developed by Ipsilon that's used to control an ATM switch. GSMP allows a controller to establish and release connections across the switch; to add and delete leaves on a point-to-point multi-point connection; to manage switch ports; to request configuration information; and to request statistics. During operation, GSMP sets up the connection between switches, establishes the protocol used and the path (VCC) through which the switches will communicate, and then passes control to *IFMP* to perform IP header compression (for TCP/IP cut-through switching).

header 5-byte cell header used by UNIs, NNIs, and ATM devices to route cell traffic. The cell header is formatted differently depending on whether the cell is being passed by a user to a UNI, or from one provider network to another (via an NNI). Each component of the header is described separately in this glossary.



UNI cell header **NNI cell header**

HEC Header Error Check — An 8-bit cell-header field that's computed over the five bytes in the cell header, using a *CRC* algorithm. The CRC polynomial ($x^8 + x^2 + x + 1$) that computes the HEC can correct a single bit error within individual ATM cells, and can also detect various multiple-bit errors.

host Any computer that provides, or can provide, services over a network to another computer, other than simple data storage and forwarding (as with a file server).

IFMP Ipsilon Flow Management Protocol. An IP switching protocol developed by Ipsilon that handles compression of the IP header. Specifically, IFMP allows a node to instruct an adjacent node to attach a Layer-2 label to a specified IP flow. The label allows more efficient access to cached routing information for that flow. The label can also enable a node to switch further packets belonging to the specified flow at Layer 2 rather than forwarding them at Layer 3. 622Vu Advisor lets you identify specific VCCs that should always be interpreted (i.e., decoded) as IFMP traffic, as detailed under ***Specifying Decode Preferences*** on page 100.

IISP Interim Inter-Switch Protocol. An early, simplified version of the PNNI (Private Network-to-Network Interface) switch-to-switch signalling protocol, still widely used. 622Vu Advisor lets you identify specific VCCs that should always be interpreted (i.e., decoded) as IISP traffic, as detailed under ***Specifying Decode Preferences*** on page 100.

Interim Inter-Switch Protocol See *IISP*.

Internet A global internet connecting millions of computers (hosts) via the TCP/IP protocol suite. There's only one Internet (with an uppercase *I*) world-wide.

internet Shortened form of *internetwork* — Any set of two or more networks that are connected by a router, where communication between computers on different networks is facilitated by consistent rules governing: 1) communications over the network — formatting, timing, sequencing, etc. (known as a *protocol*), and 2) how to connect one type of network to another

(e.g., Token Ring to Ethernet). Unlike the global Internet, there are several protocols to control traffic across internets: OSI (Open Systems Interconnection), SNA (Systems Network Architecture), Netware, DECnet, and TCP/IP are some of the more commonly used internet protocols.

IP Internet Protocol — The internetworking component of the TCP/IP protocol suite. There are clearly defined rules for sending IP over different types of networks. Standards exist for running IP over ATM networks. To communicate over the Internet, a host sends an IP datagram using the rules that apply for its local network (IP over Token Ring, for example, or IP over Ethernet). As necessary — that is, if the destination host is on another type of network — the datagram is sent via a router that removes the source-network's rules and applies the rules for the target network.

IP is generally preferred to other internetworking protocols such as X.25, because it's easier to implement on local area networks (LANs).

Ipsilon Flow Management Protocol See *IFMP*.

ISDN Integrated Services Digital Network — A far-reaching CCITT (now ITU) standard that deals primarily with issues relating to the total integration of voice and data signals. (ISDN involves other communications issues as well, but the current thrust involves this integration.) One part of the ISDN standard, knows as B-ISDN (the B stands for Broadband), includes standards related to switching technology for use with mixed voice (telephone), data, and video networks. ATM was initially developed by CCITT and its successor, the ITU, as part of the B-ISDN standard.

ISO International Organization for Standardization — A Paris-based organization that's responsible for developing and publishing standards for many industries world-wide. Within the computer industry, there are ISO standards for many things, including data communications.

ITU International Telecommunications Union.

Kb Kilobit — A unit of measure generally used to specify the capacity (transmission rate) of a connection to carry data; specifically, 1^3 (one thousand) bits.

KB Kilobyte — A unit of measure generally used to specify memory or disk-storage capacity; specifically, 1^3 (one thousand) bytes.

Kbps kilobits per second (speed of data transfer).

library See *cell library*.

Management Information Base See *MIB*.

Mb Megabit — A unit of measure generally used to specify the capacity (transmission rate) of a connection to carry data; specifically, 1^6 (one million) bits.

MB Megabyte — A unit of measure generally used to specify memory or disk-storage capacity; specifically, 1^6 (one billion) bytes.

MIB Management Information Base — File used when decoding SNMP or ILMI PDUs. 622Vu Advisor uses the values in MIB files to convert MIB Object Identifiers (OIDs) to their textual representation; otherwise (without a MIB) 622Vu Advisor only shows OIDs in their numerical form.

monitor mode One of two ways you can configure an analysis device (contrast end-station mode). In monitor mode, the 622Vu Advisor passively observes the traffic flow coming through it, optionally capturing some or all traffic for further analysis.

network One or more ATM switching platforms under the same administration. The network can be public or private.

Network-to-Network Interface (NNI) Type of connection between two *provider* ATM networks, or two devices that reside wholly within a private network. NNI functions solely to

provide a smooth connection between the two devices. It doesn't protect one device against problems in the other, but rather assumes that the two devices function correctly according to the rules of the public or private network. (In the case of NNI used on a provider network, it's assumed that the devices abide by current ATM standards.)

OAM Operations, Administration, and Maintenance.

OC data rate Optical Carrier data rate: a term referring to the rate of data transmission of a bit stream after being converted to optical signals, specified in conformance with SONET standards. Current OC transmission rates vary from 51.84 Mb/s, known as Optical Carrier level 1 (OC-1), to 2,488.32 Mb/s, or OC-48. In between are OC-3, OC-12/STM-4, and OC-24. The *n* designation specifies the number of level-1 (OC-1) circuits that could be at the data rate: OC-12/STM-4 carries 622.08 Mb/s (51.84 x 12), for example. Visual Networks offers a physical-interface option that supports OC-3 (155.52 Mb/s) and OC-12/STM-4, with future plans to support OC-48 (although no ATM standards exist currently for OC-48 speeds). See also *STS data rate, STM data rate*.

OLE Object Linking and Embedding — A Microsoft term used to refer to the capability of one piece of software (e.g., CellCommand) to create objects that you include (embed) in other systems (e.g., Visual Basic, C++, Excel, or 622Vu Advisor).

OLE Automation Capability that applications (such as 622Vu Advisor) use to expose their OLE objects to development tools that support OLE Automation — container applications such as Visual Basic or C++, for example, or macro languages. OLE Automation allows one program to essentially *operate* another program; specifically, allowing it to dynamically discover and use the interfaces to the other program at run time.

OLE object Piece of code that makes its functions available (i.e., *exposes* its functions) through distinct function groups known as *interfaces*.

OSI Open Systems Interconnection — One of several protocols commonly used to communicate over an internet. The OSI standard (an ISO standard itself) supports a seven-layer communications protocol, where each layer is responsible for a specific type of activity (raw signalling over the transmission media, data framing, placing on an internet, etc.). This is well documented in most data communications material.

Payload Type Three-bit cell-header field that serves primarily to distinguish between user and operations traffic (where operations traffic includes administration and management — OAM). The first bit is 0 for user data, 1 for OAM data.

- For user data (bit 1 is zero), the second bit is used to indicate whether the cell encountered any network congestion during the last hop: 0 indicates no congestion, 1 indicates congestion. The third bit is available to the user for any signalling purposes.
- For OAM data (bit 1 is set), the specifics of use for the second and third bits are still not finalized. (Exceptions are Payload Type 111, which is reserved for future use, and 110, which is reserved for future traffic-control and resource management.)

Payload Type Indicator See *PTI*.

PC For purposes of Agilent Technologies' product line, any "C or newer" model of the Agilent Advisor.

PDU Protocol Data Unit — The information unit of a particular communications protocol; in the case of ATM traffic, the collection of cells that make up a packet. PDUs can be packaged using any of several standard formats, as described under *ATM Adaptation Layer*. The format used varies depending on the type of data being sent and the medium over which it's being transmitted.

Physical Media Dependent sublayer (PMD) Sublayer, within the physical layer, that defines the transmitter, receiver, timing recovery, and channel specifications that facilitate a connection to appropriate transmission media.

PMD See *Physical Media Dependent sublayer*.

PNNI Private Network-to-Network Interface. A switch-to-switch signalling protocol. 622Vu Advisor lets you identify specific VCCs that should always be interpreted (i.e., decoded) as using PNNI signalling or routing, as detailed under ***Specifying Decode Preferences*** on page 100.

point-to-multipoint connection Collection of associated ATM virtual channel (VC) or virtual path (VP) links that associate endpoint nodes through a simple tree topology, and that have the following characteristics:

- A single *root link* serves as the root. When this root node sends information, all other nodes on the connection (known as *leaf nodes*) receive copies of the information.
- The current implementation of the signalling specification only supports zero return bandwidth (i.e., from the leaf nodes to the root node).
- The leaf nodes can't communicate with each other directly, but can be connected via a distributed implementation.

The current release does not support point-to-multipoint connection.

point-to-point connection Collection of associated ATM virtual channel (VC) or virtual path (VP) links that connect two endpoints. The current version of the ATM Forum signalling specification supports point-to-point virtual channel (VC) connections.

private UNI User-Network Interface between terminal or endpoint equipment and a private network.

profile See *user profile*.

property See *cell property*.

provider network Any of several *public* networks that link ATM users together. Local users typically connect to their regional ATM provider network (possibly passing through one or more private ATM networks first). The regional provider networks connect to a higher level (e.g., national) provider network, and so forth. Communications between two provider networks are facilitated through a network-to-network interface (NNI). Communications between a provider network and a user's equipment (gateway, router, host, etc.) are facilitated through a user-network interface (UNI).

PTI Payload Type Indicator. Same as *Payload Type*.

public UNI User-Network Interface between terminal or endpoint equipment and a public network.

Q.2931 [29] The broadband signalling protocol standards that are currently under development to support ATM connections at the user-network interface. These standards have been supplemented where necessary to support capabilities identified by the ATM Forum as important for early deployment and interoperability of ATM equipment (primarily to support *point-to-multipoint connections*, additional traffic descriptors, and private network addressing).

QoSMeter test session Analysis tool designed to test the quality of service on a particular virtual circuit. Using QoSMeter, you first define the set of tests you want to run. Each set of tests comprises a ***session***. The tests in a session are identical, and are defined in terms of the amount of data to send (test size), the percent of bandwidth to use when transmitting the test, and the percent of bandwidth committed to background traffic.

Next you run the session, transmitting test traffic from your analysis device, across a virtual circuit, then back to the same (or another) analysis device. You (or another user) can monitor the test traffic as it's received.

Real-time statistics Feature of 622Vu Advisor that's available any time you're not capturing traffic actively. Allows you to monitor real-time statistics for the link attached to an analysis device, and to display the active network connections on the link. Each time 622Vu Advisor detects a new connection, it displays the corresponding VP/VC identifiers and begins tracking statistics for that connection. If you notice a problem while monitoring the statistics, you can begin capturing any particular VCC(s) through a special filtering capability available via real-time statistics.

SAAL Signaling ATM Adaptation Layer (uses AAL5).

SAR See *Segmentation and Reassembly (SAR) sublayer*.

SC Sequence count, in the range hex 0–7 (specified during sequence definition when using AAL1 cell framing).

SCCP Signaling Connection and Control Part.

script Instructions that describe the transmission pattern you want to send out across an ATM network. A script sends cells in specific order, and each cell has a specific content, both in its header and payload.

Segmentation and Reassembly (SAR) sublayer One of two sublayers in each AAL (ATM Adaptation Layer protocol), as currently specified by the ITU. On the sending end of ATM transmissions, the SAR sublayer receives datagrams, video frames, etc., from the CS (Convergence Sublayer), and is responsible for breaking that data into cell-sized pieces, then mapping that data into the cell payloads of an ATM cell stream. On the receiving end, the SAR sublayer is responsible for retrieving data from the cell payloads and reassembling it into its original form (datagrams, video frames, etc.), then forwarding that data to the CS. See *ATM Adaptation Layer* for more information.

sender Within the context of ATM, the host (computer) that initially sends a cell over the network. Also used to refer to the host user or application responsible for sending the cell.

sequence Within 622Vu Advisor, a named set of cells that can be referenced as a single entity by using the sequence name. Each entry in the sequence comprises a:

- *cell name* — a descriptive name.
- *repetition count* specifying how many consecutive copies of the cell occur in that table entry; i.e., at this point in the containing sequence.

Before a sequence is transmitted, it's expanded into one contiguous stream of cells (by using the repeat counts), then it's transmitted to the DUT as a single burst.

signaling software Software responsible for enforcing the signalling (or setup) portion of the ATM protocol suite. Before ATM cells can be transmitted, the signalling software establishes a connection between the sender and receiver, and assigns a channel identifier (VPI/VCI) to the connection at each hop. Signaling software resides in each ATM device, and somewhere in the sender and receiver's equipment. Each device is responsible for contacting (and setting up communication with) the next device in the path between the two hosts.

SN Serial number, in the range hex 0–F (specified during sequence definition when using AAL1 cell framing).

SNA Systems Network Architecture — One of several protocol suites commonly used to communicate over an internet, this one defined by IBM.

SNAP Sub Network Access Protocol.

SNMP Simple Network Management Protocol. A tool that runs on top of IP to facilitate standardized management of all types of network devices. SNMP allows the Network Manager to obtain a simple set of information about each device in the network.

SONET Synchronous Optical Network: a form of fiber-optic data signalling that was first defined in the U.S. and was later incorporated as part of a broader international set of ITU standards known as SDH, or Synchronous Data Hierarchy. (The SDH standards support multiplexing over high-speed links.)

Three different terms are used to describe the SONET data-transmission standards: *OC*, *STS*, and *STM*. All three terms refer to the rate of data transmission and are described separately in this glossary.

standard.lib Default cell library. Used to store all 622Vu Advisor definitions unless you define another library(ies) for this purpose.

standard.prf Default user *profile*. Active when you first start 622Vu Advisor, and used until you add your own profile. On subsequent startups, 622Vu Advisor is initialized with the last profile used.

SSCOP Service Specific Connection Oriented Protocol.

STM Synchronous Transport Mode.

STM data rate Synchronous Transport Mode data rate: a term referring to the rate of data transmission for a bit stream, specified in conformance with SONET standards. STM levels correspond to OC and STS levels, but don't support the lowest OC/STS rate of 51.84 Mb/s. STM-1 (STM level 1), therefore, corresponds to OC-3/STS-3 and carries 155.52 Mb/s. The *n* designation specifies the number of level-1 (STM-1) circuits that could be encapsulated at the data rate (always 3 times the number of OC/STS level-1 circuits): STM-4, STM-8, and STM-16 have the same data rates, respectively, as OC-12/STS-12, OC-24/STS-24, and OC-48/STS-48 (currently the fastest data rate). See also *OC data rate*, *STS data rate*.

STP Signaling Transfer Point, or Shielded Twisted Pair cable.

STS data rate Synchronous Transport Signal data rate: a term referring to the rate of data transmission for a bit stream, specified in conformance with SONET standards. STS levels correspond exactly to OC levels, where STS-1 represents a transmission rate of 51.84 Mb/s, STS-3 represents a transmission rate of 155.52 (3 x 51.84) Mb/s, and so forth. As with OC, the *n* designation specifies the number of level-1 (STS-1) circuits that could be encapsulated at the data rate. See also *OC data rate*, *STM data rate*.

subset. Specific set of the total traffic included in a capture, where that set is defined by some combination of content, capture channel, IP addresses, and type of decode.

STS-3c Synchronous Transport System-level 3 concatenated.

TCP/IP Transport (or Transmission) Control Protocol/Internet Protocol — One of several protocols commonly used to communicate over an internet; this one developed by the U.S Department of Defense (DOD) in the 1970s and 1980s specifically to permit different types of computers to exchange information. The TCP/IP standards support a five-layer communications protocol (as contrasted with the OSI standard of seven layers).

Transmission Convergence sublayer Sublayer, within the physical layer, that defines the line coding, scrambling, and synchronization of data.

UNI (pronounced "U-knee") See *User-Network Interface*.

User-Network Interface (UNI) Type of connection between:

- A user's ATM equipment (host, router, etc.) and private ATM network equipment (known as CPE, or Customer Premises Equipment). The interface in this case, known as a *private UNI*, is used exclusively to connect hosts to devices where both are managed by the same administrative domain. It does not protect either side from equipment that misbehaves, but rather assumes that the two sides function correctly according to the current standards of the network.

- A user's ATM equipment and public ATM network equipment. The interface in this case, known as a *public UNI*, is used to connect private ATM equipment with provider networks, and protects the provider network from user or CPE equipment that may misbehave (or otherwise not adhere to the ATM standards).
- Private ATM switches (or other CPE equipment) and public ATM network equipment. The interface in this case is the *public UNI* described above.

user profile Tool used to establish a particular processing environment quickly, by loading the user profile associated with that environment. Each profile comprises a combination of:

- Settings that become effective when the profile is loaded: a cell library, use of toolbars and toolbar Help, colors used when viewing captures, and so forth.
- Up to 16 *scripts* that are run regularly by the profile user(s), and that you can initiate by clicking their icon (run button) on the profile toolbar.
- Preferences and other information that's stored session to session, so you can restart with the same settings (e.g., last user profile used, and options used to view captured traffic).

You define user profiles in two places: during capture processing (for preferences related to viewing the capture), and using the **Load User Profile** button from the main menu (for all other settings).

VC Virtual Channel (Virtual Circuit).

VCC See *Virtual Channel Connection.*

VCI See *Virtual Channel Identifier*.

Virtual Channel Connection (VCC) A Virtual Channel Connection is defined as a concatenated list of Virtual Channel (VC) links. A VC link is a unidirectional flow of ATM cells with the same VCI between a VC connecting point and another VC connecting point or a VC endpoint.

Virtual Channel Identifier (VCI) 16-bit identifier that's carried in the cell header. Together with the 12-bit VPI (Virtual Path Identifier), the VCI forms a 28-bit *channel identifier* that identifies the ATM connection. While the channel identifier changes from one hop to the next as a cell moves through the ATM internet, it stays the same between any two network elements for the life of the connection. See *channel identifier* for more information.

Virtual Path Identifier (VPI) 12- or 8-bit identifier that's carried in the cell header (12 bits for NNI transmissions and 8 for UNI, which sacrifices 4 bits for the GFC). Together with the 16-bit VCI (Virtual Channel Identifier), the VPI forms a 28- or 24-bit *channel identifier* that identifies the ATM connection. While the path identifier changes from one hop to the next as a cell moves through the ATM internet, it stays the same between any two network elements for the life of the connection. See *channel identifier* for more information.

VP Virtual Path.

VPC Virtual Path Connection.

VPCI/VCI Virtual Path Connection Identifier/Virtual Channel Identifier.

VPI See *Virtual Path Identifier*.

VP/VC Virtual Path/Virtual Circuit.

Wrap Buffers When defining filtersets, you can choose to wrap buffers or not. The option you choose applies for all buffers defined for the filterset, and indicates whether to:

- Reuse each buffer continually until the capture is stopped, essentially creating a circular buffer (box is marked). With this selection, 622Vu Advisor writes over cells that have already been stored on the analysis device after the buffer is full.
- Fill up each buffer once, then stop collecting the corresponding cells (box not marked). Cells that would otherwise be stored in the buffer are discarded; they don't fall through to any other buffers that match their content.

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Appendix B
config.ini File

This appendix contains the text of 622Vu Advisor's basic initialization (.ini) file. While the .ini file rarely requires modification, you might be asked to change it for your installation. If this is the case at your site, open the config.ini file, then edit the file using the standard Windows Notepad application. A few guidelines follow:

- The file is divided into sections, with each section enclosed in brackets: [CAPMON], etc. Generally Agilent Technologies' support staff will direct you to a particular section of this file.
- Each line takes the format *keyword* = *value*. If you make changes, modify only the righthand side of the equation.
- You can comment-out any line by placing a semicolon in front of it.

Modifying an .ini file can lead to unexpected and catastrophic consequences. Make a backup of the .ini file before changing it in any way.

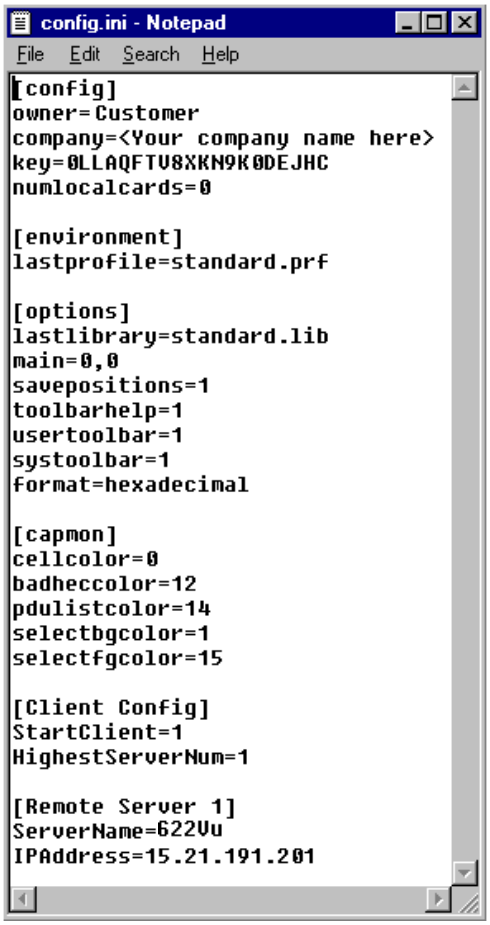
Identification and security information.

Environment variables (user profile).

Current settings for various processing options.

Capture preferences.

Devices accessible via 622Vu.



Appendix C
Summary of Libraries

622Vu Advisor is shipped with several cell libraries that are designed to help with specific types of ATM analysis, as detailed in this appendix. You can use these libraries for your own purposes, or modify them as needed.

Table 13. Libraries Distributed with the System

Library Name	Description
cb_std.lib	Contains one sample script and samples of filtersets used to capture UNI, ILMI, CLP, OAM, etc., traffic. Good as a base to edit and customize.
sample1.lib	Contains two sample scripts: One for full bandwidth split between VCIs 1 – A, transmitted in raw cell mode (not as part of PDUs), with ten cells repeated 13,000 times. This results in 130,000 cells, which fills the 8 MB of capture RAM on certain devices. The other is designed to test Bad HEC counts, and sends three good HEC cells then three bad. It repeats this process 1,000 times for a total of 6,000 cells. Includes samples of filtersets that you can modify, showing all the combinations of options (wrap, no-wrap, include idle cells, don't include idle cells, etc.).
sample2.lib	Contains sample scripts you can customize, including: • One for full bandwidth to send on VCIs 6–E, to test a switch's ability to forward a full-bandwidth pipe to ten VCIs that will each be 10% loaded. • Some UNI 3.1 traffic that you can retransmit on any VPI/VCI of your choosing. Includes some basic (non-wrapping) filtersets for simplified capture of idle cells or specific VCCs.
sample3.lib	Provides bandwidth scripts you can use to load ATM networks at various rates (1, 5, 10 – 100%), independent of the interface type. These scripts are all sent out on VCC 99/99, but you can edit the sequence to change this, as necessary, by going in at the transmit sequence level (see Chapter **9**). Includes a buffered filterset that captures VCC 99/99 and displays the percent-of-bandwidth captured. This is useful for blasting through switches and verifying sustained throughput at different levels.

C: Summary of Libraries

Appendix D
Cell Library Structure

622Vu Advisor's cell libraries serve as repositories for various information: sequence definitions (groups of cells), script definitions (groups of sequences), filterset definitions, etc. 622Vu Advisor can manage any number of cell libraries, but only one library is open (*active*) at any given time.

When you open a cell library, it displays as *library-name*.lib in the Open Library dialog box and the righthand side of the main menu. This same library is stored as *library-name*.dir on the hard disk. When you examine the *library-name*.dir file further, it contains several distinct directories. These directories are the same in each cell library, and are described below:

Directory Name	Used to store…
CellScripts	Transmit scripts. Each script is stored as a separate file, with the filename comprising the script/name plus the extension .scr. For example, a script called *Sample Script* would be stored in the CellScripts directory as Sample Script.scr. The Explorer incorrectly identifies these files as type "Screen Saver," which it derives from the extension (same extension as that for the Windows Screen Saver). You can ignore these file-type descriptions; the files are, in fact, CellScripts directory script files.
CellSequences	Transmit sequences. Each sequence is stored as a separate file, where the filename comprises the sequence name plus .seq extension. For example, a sequence called *My Seq* would be stored in this directory as *My Seq*.seq.
FilterSets	Capture filtersets. Each filterset is stored as a separate file, with the filename comprising the filterset name plus the extension .fil; for example, SampleFilterset.fil.
SearchRules	Upload capture rules: filterset rules you define on the fly for immediate use with the current active capture. You can define them in two places: • Through the capture facility's filterset wizard, in which case they're based on some combination of VCC, IP address, decode, and/or channel. • While monitoring real-time statistics, in which case they're based on some combination of VCCs. Each set of rules is stored as a separate file, with the filename comprising the name assigned to the rules, plus the extension .srl.
QoS	QoSMeter test results. Each set of results is stored as a separate file, with the filename comprising the name you assign, plus the extension .qos.

Appendix E

Regulatory Information

Laser Safety Statements

The OC-12c/SMT-4c single mode fiber-optic interface contains Class 1 laser devices. Class 1 laser devices are considered to be safe based upon current medical knowledge.

A laser safety warning label is attached to the individual modules where necessary. An example of the text on a Class 1 warning label is as follows:

"CLASS 1 LASER PRODUCT
INVISIBLE LASER RADIATION
MFD IN SINGAPORE
OF FOREIGN AND DOMESTIC COMPONENTS
COMPLIES WITH 21CFR 1040.10"

The specifications for the OC-12c/STM-4c single-mode interface module is:

Specification	Agilent J3764A		
Laser Type	Fabry-Perot Laser		
Laser Class 21CFR 1040.10 (Canada, Japan, USA) IEC 825 (Europe)	 Class 1 Class 1		
Transmitter	**Min**	**Typical**	**Max**
Avg Optical Power (dBm)	-15	-13	-8
Optical Wavelength (nm)	1293	1310	1334
Receiver	**Min**	**Typical**	**Max**
Avg Optical Sensitivity (dBm)	-28	-30	•
Avg Max Input Power (dBm)	•	•	-3
Optical Wavelength (nm)	1200	•	1550

WARNING

You must return modules with malfunctioning lasers to an Agilent Technologies Service Center for repair and calibration.

Under no circumstances look into the module connector or the end of an optical cable attached to the optical output when the device is operational.

Declaration of Conformity

Agilent Technologies	**DECLARATION OF CONFORMITY** According to ISO/IEC Guide 22 and CEN/CENELEC EN 45014	CE

Manufacturer's Name: *Agilent Technologies, Inc.*

Manufacturer's Address: *Network Systems Test Division (NSTD)*
5070 Centennial Boulevard
Colorado Springs, Colorado 80919
United States of America

Declares that the products,

Product Name: *ATM 622 undercradle and OC-12c/STM-4c single-mode optical module*
Model Number: *J3763A and J3764A*
Product Options: *This declaration covers all options of the above products.*

Conform with the following product standards:

EMC (Technical Construction File)

The product herewith complies with the requirements of the EMC Directive 89/336/EEC (including 93/68/EEC) and carries the CE Marking accordingly (European Union).

Against: *EMC test specifications EN 55011:1991 (Group 1, Class A) and EN 61326:1997*

As detailed in: *Electromagnetic Compatibility (EMC) Certificate of Conformance Report No. 1080/1/CBR, based on Technical Construction File (TCF) No. NSTD-EMC Program reference A-2961-2388-100 Revision A, dated 6 June 2001.*

Assessed by: *EMC Test Center, York EMC Services Limited Appointed Competent Body*
Fleming Building
Donibristle Industrial Park
Dalgety Bay
Dunfermine, Fife KY11 9HZ United Kingdom

Safety *IEC 61010-1:1990 + A1:1992 + A2:1995 / EN 61010-1:1993 + A2:1995*
Canada: CSA C22.2 No. 1010.1:1992

Laser/LED *IEC 60825-1:1993 + A1:1997 / EN 60825-1:1994 + A11:1996* *Class 1*

Supplemental Information:

16 October 2001
Date

Neil Yosinski
Name

Regulatory Manager
Title

For further information, please contact your local Agilent Technologies sales office, agent, or distributor.

Revision: A.00.00 Issue Date: 16 OCT 2001 Document No. J3763A-DoC-A.00.00

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