ReVeal WinCOM

User Manual

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The Verification Experts

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CONTENTS

About this manual iii
Scope iii
Abbreviations..... iii
Terms iv

1 CHAPTER 1 PRODUCT OVERVIEW 1-1

1.1 Welcome 1-1
1.2 Package Contents 1-1
1.3 Technical Assistance..... 1-1
1.4 Online Help 1-2

2 CHAPTER 2 INSTALLATION AND SETUP 2-1

2.1 Preparing to Install ReVeal WinCOM 2-1
2.1.1 System Requirements 2-1
2.1.2 Connection Requirements 2-1
2.2 Connecting to an Analyzer 2-2
2.2.1 Cabling a Network Connection 2-3
2.2.2 Cabling a Direct Ethernet Connection 2-3
2.2.3 Cabling a Direct Serial Connection 2-3
2.3 Installing the ReVeal WinCOM Software Package 2-4
2.4 Registration 2-5
2.5 Setting up ReVeal WinCOM 2-6
2.5.1 Setting up Communications 2-6
2.5.2 Checking the Spectrum Analyzer Setup 2-8
2.6 Logging on to a Spectrum Analyzer 2-8
2.6.1 Logging On 2-8
2.6.2 Choosing the Date Format 2-9

3 CHAPTER 3 FILE AND RECORD MANAGEMENT 3-1

3.1 Naming Files and Records 3-2
3.2 Selecting a Record (AT2500 series) 3-3
3.3 Copying AT2500 Records with ReVeal WinCOM 3-3
3.4 Selecting a Database (AT2000 series) 3-5
3.4.1 Opening a Records Database 3-5
3.4.2 Opening a WinCom Database 3-6
3.5 Retrieving and Updating Traces (WinCom) 3-7
3.6 Creating and Updating Database Files (WinCom) 3-8
3.6.1 Creating and Updating a Records Database File 3-9
3.6.2 Creating and Updating a WinCom Database File 3-9
3.7 Viewing and Editing Record Properties (WinCom) 3-10

4 CHAPTER 4 TRACEVIEW 4-1

4.1 Viewing Trace Records 4-1
4.1.1 Viewing AT2000 Traces 4-1
4.1.2 Viewing AT2500 Traces 4-1
4.2 Spectrum Analyzer Instrument Settings 4-2
4.2.1 Vertical Scale 4-2
4.2.2 Reference Level 4-3
4.2.3 Markers (vertical, horizontal, peak, and tilt) 4-4

4.3 Defining Custom Settings for TraceView 4-7
4.3.1 Customizing the TraceView Colors 4-7
4.3.2 Choosing a Temperature Unit 4-8
4.3.3 Display Units 4-8
4.3.4 Setting the Date Format 4-9
4.3.5 Using the TraceView Toolbar 4-9
4.3.6 Viewing Video Traces 4-9
4.3.7 Customizing the Video Trace Colors 4-11
4.4 Viewing QAM Data 4-12
4.4.1 Zooming in on a Constellation 4-12
4.4.2 Viewing Statistical Data 4-13
4.4.3 Viewing the Adaptive Equalizer Display 4-14
4.4.4 Using the QAM Mode Toolbar 4-16
4.5 Printing Reports and Screens 4-17
4.5.1 Defining the Print Setup 4-17
4.5.2 Using the Print Preview 4-17
4.5.3 Printing a Screen 4-18
4.5.4 Printing Multiple Records 4-18
4.6 Exporting Data 4-19
4.6.1 Exporting a Single Trace to ASCII Format (CSV) 4-19
4.6.2 Exporting Multiple Traces to ASCII Format (CSV) 4-19
4.6.3 Exporting a Channel Plan 4-20
4.6.4 Exporting to the Clipboard (BMP) 4-21
4.6.5 Exporting to the VeEX POP Report 4-21
4.6.6 Using the VeEX Preformatted Excel File 4-23
4.6.7 Exporting to a FamilyWare File (.TSD) 4-24

5 CHAPTER 5 CHANNEL PLAN EDITOR 5-1

5.1 Creating a Channel Plan File 5-1
5.2 Defining Channels 5-2
5.2.1 Defining an Analog Channel 5-2
5.2.2 Defining a Digital Channel 5-5
5.2.3 Defining Other Channels 5-6
5.2.4 Defining Multiple Channels 5-8
5.3 Copying a Channel Plan 5-9
5.4 Editing a Channel Plan 5-10
5.5 Saving, Importing, & Exporting a Channel Plan 5-11
5.5.1 Saving a Channel Plan File 5-11
5.5.2 Importing a Channel Plan File 5-11
5.5.3 Exporting a Channel Plan File 5-12

6 CHAPTER 6 TROUBLESHOOTING AND MAINTENANCE 6-1

6.1 Moving to a New Computer 6-1
6.2 Uninstalling ReVeal WinCOM 6-1
6.3 Upgrading Firmware 6-1
6.4 Troubleshooting Communication Errors 6-2
6.5 Technical Support 6-3

7 CHAPTER 7 LEGAL NOTICES 7-1

ReVeal WinCOM License Agreement 7-1

8 CHAPTER 8 INDEX 8-3

About this manual

This manual describes the VeEX WinCom and ReVeal WinCOM data management software that helps you take full advantage of information collected with your VeEX analyzer. WinCom and ReVeal WinCOM are packaged in the same software and many of the commands are common to both programs, especially for the AT2000 series. Unless otherwise stated, instructions are the same for both programs. Wherever required, this manual specifies whether the command is only for WinCom or only for ReVeal WinCOM. Please note that only ReVeal WinCOM supports the AT2500 series analyzer.

Before using any WinCom or ReVeal WinCOM software, you should already have a working knowledge of your model of the VeEX spectrum analyzer and you should know how to save measurement data and site information. If you are unfamiliar with these functions, consult your VeEX analyzer operation manual.

Scope

This manual assumes the user has a basic knowledge of computers, the Windows operating system and the VeEX spectrum analyzer, including the QAM analyzer features where applicable.

Abbreviations

ASCII	American Standard Code for Information Interchange
AUTO	Auto Test
BAS	Bidirectional Alignment Trace
CW	Carrier Wave or Continuous Wave
DHCP	Dynamic Host Configuration Protocol
DIST	Distortion Trace
DM	Depth of Modulation Record
DNS	Domain Name Server
DPWR	Digital Power Record
FCC	Federal Communications Commission
FR	Frequency Response Record
HUM	Hum Modulation Trace
MPEG	Motion Pictures Expert Group
POP	Proof of Performance
PPM	Parts Per Million
QAM	Quadrature Amplitude Modulation; also a QAM Mode Record
SA	Spectrum Analyzer Mode Trace
SLM1	Signal Level Meter Bar Graph (Frequency Counter)
SLM2	Signal Level Meter Bar Graph (TV Channel Mode)
SLM6	Signal Level Meter Bar Graph (6 channels)
SRTB	Sunrise (VeEX) Telecom Broadband
TCP/IP	Transmission Communication Protocol / Internet Protocol
TDM	Time Domain Measurement Trace

Terms

Autocal	Routine that automatically adjusts the spectrum analyzer's measurement functions to a set of computer-generated traceable calibration standards, compensated for the current ambient temperature.
Autotest	Function to automatically measure frequencies and levels for all tagged channels and frequencies in the active channel plan.
Baud Rate	Rate at which the data is sent over serial communications, measured in bits per seconds (bps) or in baud (state changes per second). Baud and bps are synonymous only for two-level modulation with no framing or stop bits.
Channel Plan	List of channels (line-up) for a particular headend or location.
Channel Plan File	List of channel plans within a selected file. A channel plan contains individual channel line-ups.
Domain	A name that identifies one or more IP addresses.
Gateway	Alternate term for router. Computer network device that connects autonomous systems by intercepting and routing data from one network to another. Gateways use the subnet number of data and determine which IP addresses to process based on a subnet mask.
Hub	Computer network device that accepts data from multiple points and then forwards the data using a switch.
Records Database	File named Records.bin, used for uploading traces and their settings to the AT2000 spectrum analyzer. The number of traces that can be stored in a Records Database file is limited to 100 trace records for the AT2000 series analyzer.
Reference Level	Measurement level in dBmV shown at the top of the graticule display. The reference level is user-definable with a given range.
Remote Spectrum Mode	Mode of operation where the spectrum analyzer is controlled by a VeEX software application running on a PC.
Router	Device that forwards packets between networks. The decision to forward or not is based on the network layer and routing tables.
Subnet	A segment of an IP network. In an IP address, a portion of the address is used to identify the subnet. A subnet mask is used by routers to forward data to the network segment, based on its own routing tables. A typical subnet mask is 255.255.255.0, which indicates that the router should allow or deny access based on the first three parts of the IP address.
Tag	In WinCom, a checkmark indicating that a record has been selected for printing.
Test Point	Connection on a device used for making signal measurements.
WinCom Database	File named *.WCD, used for archiving traces from AT2000 series analyzers on a computer There is no trace count limitation (see also Records Database). The WinCom database file can store traces from multiple AT2000 series analyzers. WinCom database records can be converted to a records database file and uploaded to an AT2000, providing trace-count limitations of the AT2000 are observed.

Chapter 1 PRODUCT OVERVIEW

1.1 Welcome

The ReVeal WinCOM software package is a data management software that is used with the VeEX AT2000 and AT2500 series spectrum analyzer products, providing access to the information collected with the analyzer, enabling firmware upgrades, and allowing you to download files to the analyzer or store files on your PC.

The ReVeal WinCOM software package communicates with the AT2500 series analyzers and also incorporates a version of WinCom for the AT2000 series.

The WinCom application offers a built-in charting utility, TraceView. TraceView utilizes your PC to display the data collected with the analyzer so you can analyze, chart, and print various reports to help effectively manage your cable system. This utility displays record traces and exports measurement data directly to the Windows clipboard, in BMP format, to a VeEX or FamilyWare proof of performance file (.CSV and .TSD), or an ASCII text file (.CSV) for processing in a spreadsheet program.

The ReVeal WinCOM software package also provides an easy way of upgrading the AT2000 and
AT2500 analyzers with the latest firmware, without having to return the unit to the factory.

Note: Some upgrades require hardware changes as well as new firmware. In these situations, the unit must be returned to the factory.

1.2 Package Contents

Please verify that your software package is complete. It should contain the following items:

- ReVeal WinCOM software package on CD
- ReVeal WinCOM User's Manual (Hard copy and integrated help file)
- Null Modem cable (for direct PC-to-analyzer serial connection)
- Ethernet Crossover Cable (for direct PC-to-analyzer Ethernet connection)

1.3 Technical Assistance

VeEX maintains regular office hours from 8:00 AM to 8:00 PM Eastern time, Monday through Friday. Call Customer Care at the number below, or e-mail us for technical and sales support. Please see Chapter 7 for licensing details.

Tel: +1 510 651 0500
Fax: +1 510 651 0505
E-mail: customercare@veexinc.com

1.4 Online Help

The Help menu provides you assistance with this application. Use this menu to access the product version number, which you may need for technical support purposes.

You can register the ReVeal WinCOM software through the Help menu. If you have received a password for your product (see section 2.4 on page 2-5), you can use this menu to access the dialog box for registration. Once you are registered, there is no time limit to usage of ReVeal WinCOM.

In addition to these basic Help functions, WinCom includes on-line help available when you select Help Topics from the Help menu, a link to the release notes that may be shipped with the product (ReadMe.txt file), and a link to the VeEX website.

Chapter 2 INSTALLATION AND SETUP

2.1 Preparing to Install ReVeal WinCOM

Before you install ReVeal WinCOM, make sure your computer meets the minimum requirements. To save time connecting your spectrum analyzer to your computer, make sure you have the right cables. Cables for direct connections are provided.

2.1.1 System Requirements

The following table shows the recommended minimum platform requirements for ReVeal WinCOM.

Table 2-1: ReVeal WinCOM Requirements

Category	Minimum Requirements
Machine Class	Pentium, 1GHz or better
Main Memory	256 MB of RAM
Display/Video card	SVGA, 800 x 600 resolution
CD-ROM	Any type
Hard Disk Size	500 MB
LAN	Ethernet 10/100
Operating System	Windows 2000 or Windows XP

2.1.2 Connection Requirements

You need to connect your PC to a VeEX spectrum analyzer in order to transfer files or upgrade firmware. Three standard connection types are supported:

Table 2-2: Connection Types and Cabling Requirements

Connection Type	Required Cable
1. Networked Ethernet communications (using a hub)	Standard Ethernet cable
2. Direct (PC to analyzer) Ethernet communications	Crossover Ethernet cable
3. Direct (PC to analyzer) serial communications	Null modem cable

2.2 Connecting to an Analyzer

The AT2000 and AT2500 analyzers support a direct RS-232 connection, a direct Ethernet 10Base-T connection or an Ethernet connection to a local area network (LAN). Null modem cables for direct connections are provided with ReVeal WinCOM. For a LAN connection, use standard Ethernet cables. These cables are not provided.

On the analyzer, you need to set up the remote connection. Refer to the analyzer's user guide for complete instructions on setting up TCP/IP or serial communications. Check the following:

- Make sure that you set the system type to Server.
- Make a note of the system ID since ReVeal WinCOM requires this information to complete the connection setup.
- Make sure the analyzer is in remote mode.

The following sections cover the three possible connections, as shown in Figure 2-1:

1. an Ethernet connection to a local area network (LAN)
2. a direct Ethernet 10Base-T connection
3. a direct RS-232 connection

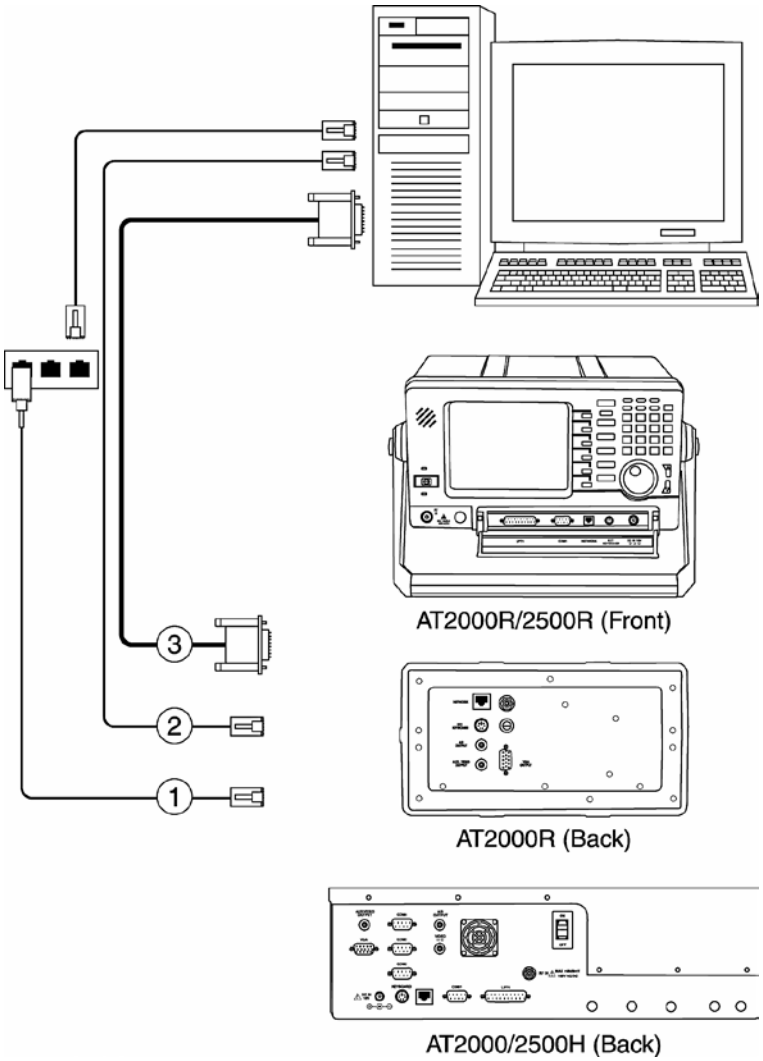


Figure 2-1: Connecting to an Analyzer

2.2.1 Cabling a Network Connection

To communicate over a LAN, the analyzer and your PC running ReVeal WinCOM must be connected to the same network via a hub or router. Do not use crossover cables for these connections; use standard Ethernet cables. These cables are not provided.

Refer to Figure 2-1. These instructions are for the cabling numbered “1” in the diagram.

To set up a network connection:

1. Connect your PC to your network using a straight-through standard CAT-5 Ethernet cable.
2. Connect the analyzer to your network using a straight-through standard CAT-5 Ethernet cable. Use the RJ-45 jack on the analyzer. On “R” models, the RJ-45 jack is on the front of the unit. On “HM” models, the RJ-45 jack is on the rear of the unit.

2.2.2 Cabling a Direct Ethernet Connection

Refer to Figure 2-1. These instructions are for the cabling numbered “2” in the diagram.

To set up a direct Ethernet connection:

Connect your PC directly to the analyzer using a crossover Ethernet cable. This cable is provided with ReVeal WinCOM. Use the RJ-45 jack on the analyzer. On “R” models, the RJ-45 jack is on the front of the unit. On “HM” models, the RJ-45 jack is on the rear of the unit.

2.2.3 Cabling a Direct Serial Connection

Refer to Figure 2-1. These instructions are for the cabling numbered “3” in the diagram.

1. Connect your PC directly to the analyzer using a null modem serial cable. This cable is provided with ReVeal WinCOM. Use one of the COM ports (DB-9 connectors) on the analyzer. On “R” models, the COM ports are on the front of the unit. On “HM” models, the COM ports are on the rear of the unit.
2. On the analyzer, set up the serial parameters for the remote connection. Refer to the analyzer’s user guide for complete instructions on setting up serial communications. Make sure that the communication parameters (baud rate, data bits, parity, etc.) match the settings on the analyzer before attempting communications. On the AT2500, please note that the maximum baud rate for serial communication is 115,200 baud.

2.3 Installing the ReVeal WinCOM Software Package

You may receive ReVeal WinCOM on a CD or from a Web download. The program's content same for all media. To install ReVeal WinCOM, you need to run the SETUP.EXE program. Access

Note: To downgrade WinCom II to an older version, the newer version must be manually uninstalled before installing the older version. Do not install multiple versions of the software on the same computer since this impedes operation of all versions.

Table 2-3: Installation Media

Media	Access to Setup Program
CD	With the ReVeal WinCOM CD, the installation program starts automatically when the CD is inserted into the drive. If the program fails to start, browse to the root directory of the CD and click SETUP.EXE. Follow the onscreen prompts.
CD Suite	ReVeal WinCOM may come on a CD containing other VeEX Telecom software. Upon insertion of the CD, an installation program should automatically execute, allowing you to choose which of the applications to install. If the program fails to start, browse to the WinCom directory on the CD and click SETUP.EXE. Follow the onscreen prompts.
Web Download – ZIP File	Save the WINCOM.ZIP file from the VeEX Telecom website in a temporary directory on your computer, and then extract all of the files to a temporary directory, using PKUNZIP or WINZIP. Now, run the SETUP.EXE program, in the temporary directory, and follow the onscreen prompts. Once, installed, the temporary files can be deleted. Keep the ZIP file in case you need to re-install the software.
Web Download - EXE File	Save the WINCOM-INST.EXE file from the VeEX Telecom website in a temporary directory on your computer and double-click on it to perform the installation. This is self-extracting archive decompresses, installs and deletes temporary files automatically. Follow the onscreen prompts.

Once ReVeal WinCOM is installed, contact VeEX Sales Support to get a password to activate the software.

2.4 Registration

Every time you start an unregistered copy of ReVeal WinCOM, the registration dialog box appears. When trying to launch ReVeal WinCOM, the new dialog that appears will contain a Program ID. A license key is required to activate a 30-day or a fully licensed copy of the s/w. For the 30-day, once the time limit expires, the program will not function until registered.

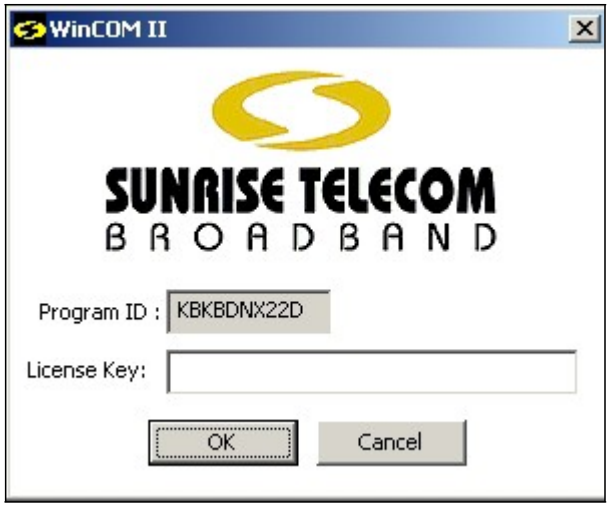


Figure 2-2: Registering ReVeal WinCOM

To obtain your License Key, contact VeEX Inc. Customer Care.

Customer Care:
Phone: + 1 510 651 0500
E-mail: customercare@veexinc.com
Website: www.veexinc.com

You must provide the following:

- Program ID

A Customer Service representative will provide you with a password that can only be used on the registered computer. Once registered, you proceed directly into the program when you start up ReVeal WinCOM.

2.5 Setting up ReVeal WinCOM

ReVeal WinCOM can store multiple connection settings for the AT2000 or AT2500 series analyzer. When you create a connection setup, you must specify which type of analyzer you are using. Once connected, ReVeal WinCOM displays only the functions that are available on the analyzer model you have specified. For example, with an AT2500, ReVeal WinCOM displays menu options that only apply to a 1.5 GHz device. These options do not appear for the 1 GHz AT2000.

2.5.1 Setting up Communications

Creating a New Connection

To create a connection between your computer and the analyzer, go to ReVeal WinCOM's Options menu and select Communication Settings. The device access configuration window appears.

The first time you call up this window, the fields are grayed out because there are no connections in the list. On the left side of the device access configuration window, click the "+" symbol to add a new device. You can now set up the connection to this device.

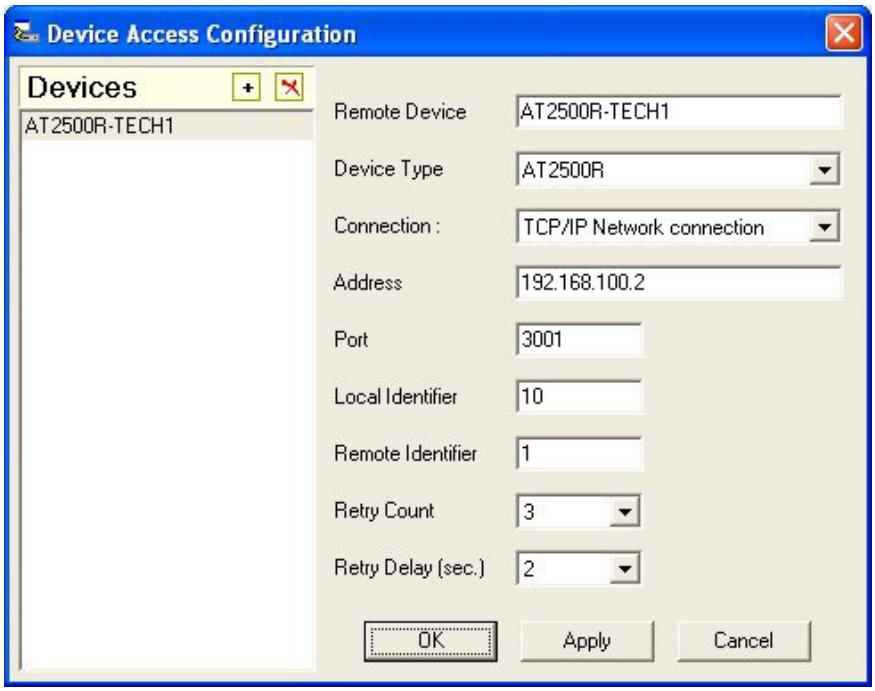


Figure 2-3: Setting Up Communications

1. In the Remote Device field, choose a name for the device. You can enter up to 16 characters, including spaces. This name must be unique. It appears in the list of possible devices when you choose Logon using from the Communication menu.
2. In the Device Type field, select AT2000R, AT2000HM, AT2500R or HM. Make sure that you identify your device correctly. ReVeal WinCOM uses this field to present appropriate menu choices for your device during initial handshaking.
3. In the Connection field, choose either "TCP/IP Network connection" or "Serial connection via COMn", indicating your PC's COM port (1 to 4). If you are using a modem, you must configure it in Windows and not in ReVeal WinCOM. For direct serial connections, a null modem cable is required. For a direct TCI/IP connection, a crossover Ethernet cable is required.

   Depending on whether you are using a serial or Ethernet connection, ReVeal WinCOM displays the appropriate fields so that you can specify the communication parameters.

Table 2-4: Ethernet and Serial Connection Setup

Connection	Field	Description
• TCP/IP	Address	Enter the IP address assigned to the analyzer you are connecting to. You need to find out what address has been assigned to the analyzer before you can communicate with it. If the analyzer is connected to a LAN, it may be set up to receive its IP address from a DCHP server. If it is set up to use a static IP address, it may still be set to the factory default, which is 192.0.1.200.You can change the static IP address of the analyzer if desired. Refer to the analyzer user's manual for instructions.
	Port	Enter the port used for TCP/IP communication with the analyzer. It is possible to use a common IP address for multiple devices in one site and assign each of the units a different port number. You should generally use port numbers above 3000. The default port is 3001. Note: Avoid assigning port numbers that conflict with standard ports (such as port 21 reserved for FTP) or ports in use by other programs or equipment.
• Serial	Baudrate	Select the port's speed (baud rate) for serial communications. The analyzer's default baud rate on COM 1 is 115200. Possible values range from 2400 to 115200. Choose a slower baud rate if the RS-232 cable connecting the PC to the analyzer is long. The speed on your PC's port and on the analyzer must match.

4. In the Local ID field, enter a number for your PC. It must be unique from all other local IDs in the system. The default is 10 and ID numbers may range from 10 to 98.
5. In the Remote ID field, enter the system ID assigned to the analyzer. By default, the spectrum analyzer's system ID is set to 1. When you have multiple devices on the same serial connection, the ID must be unique. For TCP/IP communications, the remote ID does not need to be unique since the IP address is used to route data to the correct unit.
6. In the Retry Count field, select the number of times (from 3 to 6) you want ReVeal WinCOM to attempt to connect to an analyzer before responding with a timeout message.
7. In the Retry Delay (sec.) field, enter the number of seconds (from 1 to 10) that ReVeal WinCOM should wait before attempting to connect again to the analyzer.
8. Click OK to save the setup.

Editing a Connection

To make changes to an existing connection between your computer and the analyzer:

1. In ReVeal WinCOM's Options menu, select Communication Settings. The device access configuration window appears.
2. On the left side of the device access configuration window, select one of the devices from the list. Its name now appears in the Remote Device field. Keep this name unless you need to rename the connection.
3. Make any changes to the connection parameters. See steps 2 to 8 in the Creating a New Connection section. Remember to click Apply or OK to save your changes.

2.5.2 Checking the Spectrum Analyzer Setup

Once the device connection has been defined, you need to make sure that the spectrum analyzer is set up and connected to the PC or the network, and that the correct ports and cable are used. Before attempting to log on, please check the following:

1. You have connected the proper cabling (see section 2.1.2 on page 2-1).
2. The AT2000 has firmware version 4.21 or higher; and the AT2500 has firmware 1.00 or higher.
3. You have configured the analyzer's settings. Make sure:
   - You are using the appropriate port and setup
   - The unit is in server mode (system type is set to "Server")
   - The system ID is correct
   - The analyzer is in remote mode. On the "R" series, from any mode except Menu, press the COMM function button to put the unit into remote mode. Or, select the Remote icon in the menu, and then select a mode such as Spectrum Analyzer. On "HM" models, the unit is normally set to operate in remote mode by default.
4. You have configured the communications in ReVeal WinCOM to match the communication settings in the analyzer.

Note: If your current session crashed while connected to the analyzer, it may take up to 3 minutes before Windows will close the socket and before the analyzer will allow another log on attempt.

2.6 Logging on to a Spectrum Analyzer

2.6.1 Logging On

The Communication menu in ReVeal WinCOM includes two options for logging on to a spectrum analyzer: Logon and Logon Using. Logon attempts to establish a communication link with the analyzer, using the last connection that was selected. Logon Using allows you to select a connection from a list. Depending on the type of connection, it may take some time to establish the connection.

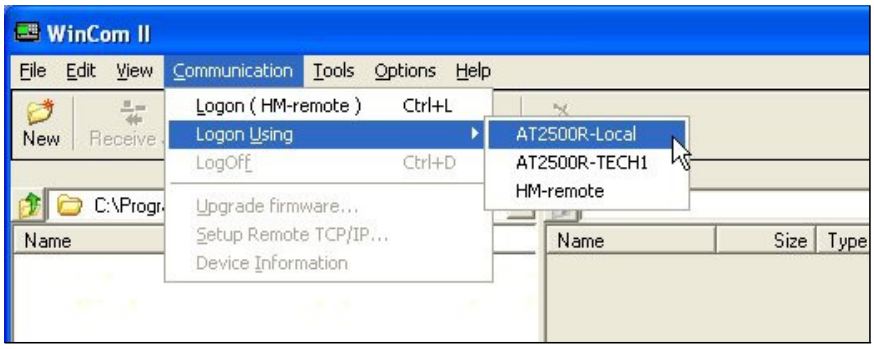


Figure 2-4: Choosing a Logon Setup

To start a session with a spectrum analyzer:

1. From the Communication menu, select either Logon or Logon Using. Make sure you choose a device that is connected to the PC or to the network.
2. If you were able to start the session successfully, the Remote Files pane on the right side of the window should now list the files in the remote spectrum analyzer.

3. To end your session, select Log Off from the Communication menu. This terminates the communication link to the analyzer, freeing it for use by others and allowing ReVeal WinCOM to connect to another analyzer.

2.6.2 Choosing the Date Format

You can choose the date and time format that you want WinCom to use. This function is only available in WinCom.

To select a date format:

1. In the ReVeal WinCOM Tools menu, select Launch WinCom. This opens a separate window for WinCom.
2. In the Options menu, select Date Format. A window appears for selecting international or U.S. standard formats.
3. From the drop down list, select the format you want to use. To help you choose, an example of the selected format appears at the bottom of the window.
4. Click OK to confirm your choice. WinCom updates the date display on any traces that you are viewing (see Chapter 4, Trace Viewer).

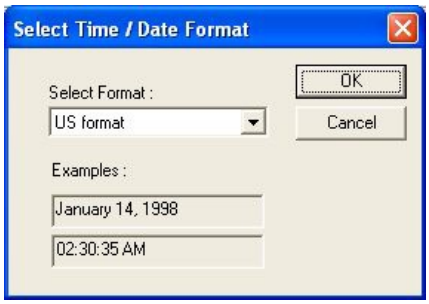


Figure 2-5: Setting the Date Format

Chapter 3 FILE AND RECORD MANAGEMENT

Each VeEX AT2000 or AT2500 series analyzer can store measurements, traces and instrument settings in non-volatile memory. ReVeal WinCOM is used to transfer data between your computer and a VeEX analyzer, as well as manage the various files on your computer and on your analyzer.

When you first start ReVeal WinCOM, there are no files stored on your computer. To begin storing traces and settings on your computer, you must first establish a connection with a spectrum analyzer. Then, you can retrieve files from the remote analyzer. To upload files from your computer to a remote analyzer, you must first create the file (such as a channel plan) or download the file from another analyzer.

This chapter explains how to:

- select records and files
- copy records and files to the analyzer
- retrieve records and files from the analyzer
- save records and files and delete unwanted records
- view record properties

Note: For information on exporting records and instrument settings for proof-of-performance or FCC testing and compliance documentation, refer to section 4.6 on page 4-19.

3.1 Naming Files and Records

WinCom supports two types of databases: the Records Database (Records.bin) and the WinCom Database File (*.WCD). Only the records database is uploaded to a remote analyzer. The number of traces that can be stored in a records database file is limited to 100 trace records for the AT2000 model. The WinCom database does not have a record count limit but is limited to the amount of free disk space you have. Always leave enough free disk space for Windows to operate properly.

ReVeal WinCOM operates differently because the AT2500 series has a different file structure. It stores traces and settings as individual files, rather than as a database. The AT2500 can store
100 instrument settings and 250 trace records.

Each AT2000 and AT2500 file that you can retrieve or upload appears in the following table. Upon retrieval, AT2500 files retain the same name and file extension as the one that was used on the analyzer. For the AT2000, however, the files are renamed with the file extension indicated below. You can choose the first part of the file name.

Table 3-1: Files Stored in Analyzers

AT2000 Files	AT2500 Files	Content
Records.bin (saved as *.bin on PC)	*.xml in Records directory	Stored measurement records and traces.
Settings.bin (saved as *.set on PC)	*.xml in Settings directory	Stored instrument setups.
Plans.bin (saved as *.pln on PC)	*.acp in Channel Plans directory	Channel plans for NTSC, PAL or other television standards.
Colors.bin (saved as *.clr on PC)	Colors.clr in Color Settings directory You cannot change this name on the PC.	Customized color settings used on the analyzer.
Param.bin (saved as *.par on PC)	Params.prm in Parameter File directory You cannot change this name on the PC.	User preferences for the analyzer.

3.2 Selecting a Record (AT2500 series)

This section applies to the AT2500 series analyzer and the ReVeal WinCOM user interface. See section 3.4 on page 3-5 if you are using an AT2000 series analyzer.

Instead of storing all records in one database file, the AT2500 stores each individual records in a specific directory (see Table 3-1 on page 3-2). However, ReVeal WinCOM stores the individual records in any directory you want. You may want to organize your records by type.

To select a record in ReVeal WinCOM:

1. Browse to the desired directory. By default, ReVeal WinCOM calls up the list of files in the \VeEX Telecom directory. If required, browse to another directory. To do so, go to the File menu and choose Select folder, or use the drop down directory list in the Local Files pane to select a folder.
2. Once you are in the correct folder, click on a record to copy it to a remote AT2500 if you are already logged on. See section 3.5 for instructions on copying files.

3.3 Copying AT2500 Records with ReVeal WinCOM

Use ReVeal WinCOM's main interface to retrieve individual records or a set of records. In order to retrieve records from the AT2500, you must establish a communication connection with the AT2500. Note that in order to use ReVeal WinCOM, the AT2500 must be put in remote mode. On the "R" series, from any mode except Menu, press the COMM function button to put the unit into remote mode. Or, select the REMOTE icon in the menu, and then select a mode such as Spectrum Analyzer. On "HM" models, the unit is normally set to operate in remote mode by default.

When you log on to an AT2500 series analyzer, you may see only the files on the right, in the Remote Files pane. By default, ReVeal WinCOM displays the records in the AT2500's Traces directory. Browse to the correct directory on the AT2500 before you select a record.

To copy files to your computer from the remote analyzer:

1. Log on to an AT2500 series analyzer (see section 2.6.1 on page 2-8).
2. In the left pane, select the destination directory for your local files. By default, ReVeal WinCOM opens the \VeEX Telecom directory. To go to another directory, use the drop down window or use the File menu to choose Select Folder, Parent Folder or New Folder.
3. Browse to the appropriate directory on the AT2500. To display the directories, use the drop down box in the Remote Files pane on the right side of the window.
4. Select a record from the right pane, and then drag it to the left pane, or click Receive in the toolbar. You can also select Copy from the Edit menu. This step may be repeated for each record or for multiple records transfer, proceed to the next step. See Figure 3-1.
5. Multiple records may be selected in the Remote files (right pane) by holding down the Shift and/or Ctrl key on the computer and clicking on the records you want transferred over. Once selected, either drag and drop the records or click on Receive in the toolbar to transfer them If you want to copy all the records at one, click Receive all in the toolbar.

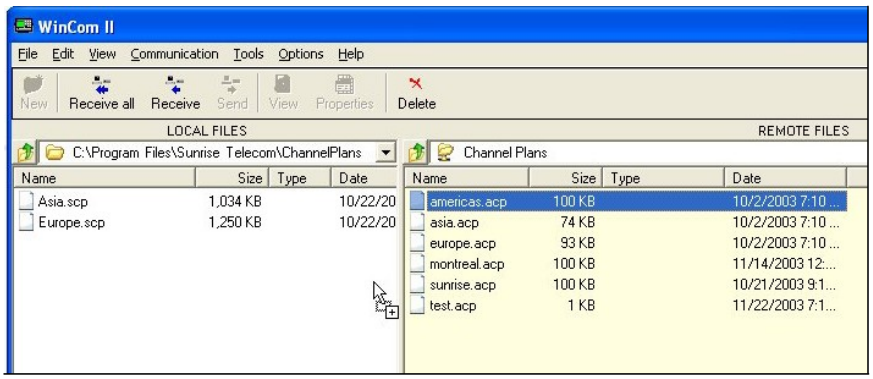


Figure 3-1: Dragging a Record from a Remote AT2500 to the Computer

To copy files from your computer to the remote AT2500 analyzer:

1. Log on to an AT2500 series analyzer (see section 2.6.1 on page 2-8).
2. In the right pane, select the directory on the remote AT2500 where you want to store the record. See Table 3-1 on page 3-2 for a list of directories that the AT2500 uses to store records.
3. Browse to the appropriate directory on the AT2500. To display the directories, use the drop down box in the Remote Files pane on the right side of the window.
4. Select a local record from the left pane, and then drag it to the right pane, or click Send in the toolbar. You can also select Copy from the Edit menu and then select Paste when your cursor is in the Remote Files pane. This step may be repeated for each record, or for multiple records transfer, proceed to the next step.
5. Multiple records may be selected in the local pane by holding down the Shift and/or Ctrl key on the computer and clicking on the records you want transferred over. Once selected, either drag and drop the records or click on Send in the toolbar to transfer them

3.4 Selecting a Database (AT2000 series)

The following sections apply to the AT2000 series analyzer and the WinCom user interface. See section 3.2 on page 3-3 if you are using an AT2500 series analyzer.

3.4.1 Opening a Records Database

A Records Database file is an AT2000 format file, named RECORDS.BIN on the AT2000. It contains trace records such as captured analyzer traces and the analyzer settings corresponding to the trace. The number of traces that can be stored in a Records Database file is limited to 100 or 200 trace records, depending on the storage capabilities of your AT2000 model.

To open a Records database on a remote analyzer:

1. Connect to an AT2000 analyzer. See section 2.6.1 on page 2-8 to log on.
2. WinCom detects a connection with an AT2000 analyzer and opens the WinCom interface. The current Records Database file is displayed in the Traces pane on the right. You can now click on a record and view its properties, delete it, or copy it to your computer.

If you already have record database files stored on your computer, you can also open one of these files for editing.

To open a Records database if you are offline:

1. If you are not already in WinCom, go to the ReVeal WinCOM Tools menu and select Launch
   WinCom. This opens a separate window for WinCom.
2. In WinCom, go to the File menu and select Open. Select a file that has the extension .BIN and click Open.

Note: By default, WinCom calls up the list of files in the \VeEX Telecom\Databases directory. If required, browse to another directory to locate the database file you want to open.

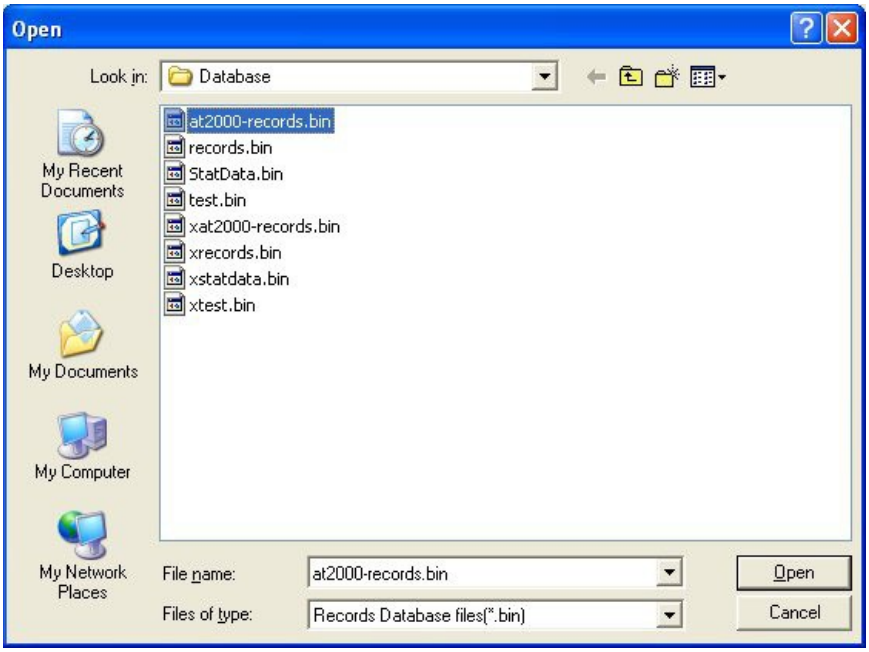


Figure 3-2: Opening a Records Database File

3. Once you click Open, the content of the records database appears in the right pane. You can now click on a record to view its properties or to delete it. You can also copy files in this records database to a WinCom database. See section 3.3 starting on page 3-3 for information on copying records and updating files.

3.4.2 Opening a WinCom Database

The WinCom database file is used for archival storage of AT2000 traces on the PC. It does not have a trace count limitation. It can be used for long-term storage of traces from multiple AT2000s. You can select trace records and convert then to a records database file that can then be uploaded to any AT2000 providing that you do not exceed the storage capacity of the AT2000.

Note: You do not have to be connected to an analyzer in order to open a WinCom database.

To open a WinCom database:

1. In ReVeal WinCOM, go to the Tools menu and select Launch WinCom. This opens a new window showing the WinCom interface.
2. In WinCom, go to the File menu and select Open. Select a file that has the extension .WCD, and click Open.

Note: By default, WinCom calls up the list of files in the \VeEX Telecom\Databases directory. If required, browse to another directory to locate the database file you want to open.

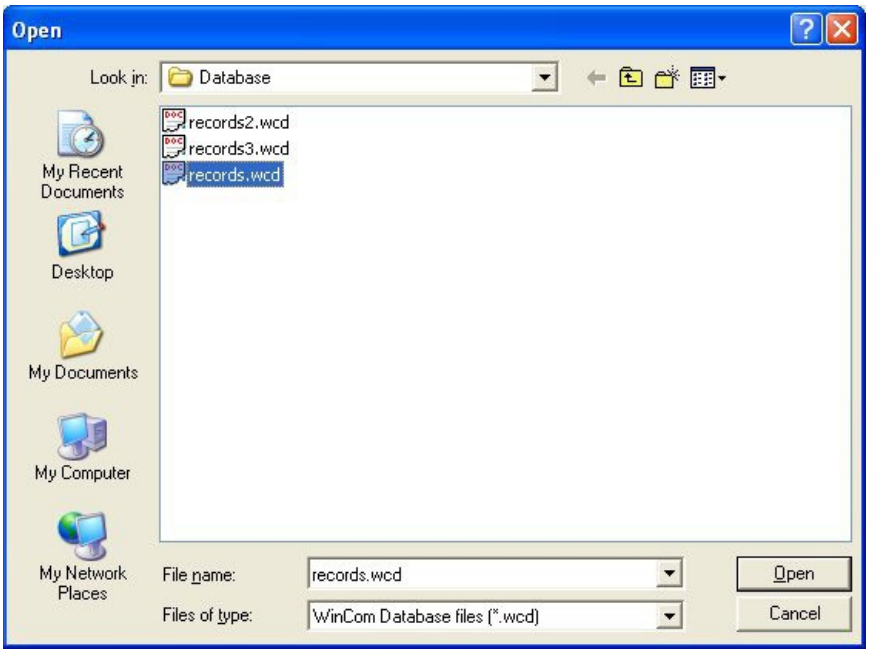


Figure 3-3: Opening a WinCom Database File

3. Once you click Open, the content of the WinCom database appears in the left pane. You can now click on a record to view its properties or to delete it. You can also copy one or more records to a remote AT2000 if you are already logged on.

3.5 Retrieving and Updating Traces (WinCom)

The Update and Retrieve options in the Communication menu are used to transfer data between WinCom and your AT2000 analyzer. You need to be connected to an AT2000 in order to transfer records. When you click the Update or Retrieve button, WinCom displays the list of files that you can transfer to and from the remote analyzer (see Figure 3-4).

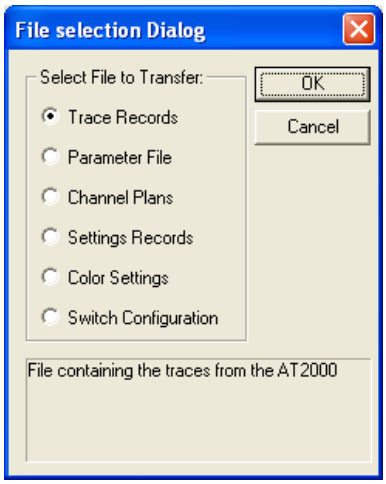


Figure 3-4: Selecting Files for the AT2000 Series Analyzer

To copy a file from the remote analyzer to WinCom:

1. Log on to an AT2000 series analyzer (see section 2.6.1 on page 2-8).
2. Click on Retrieve in the WinCom database file management window (see Figure 3-5 on page 3-8).
3. In the file selection window (see Figure 3-4), open the file on the remote analyzer that you want to retrieve. By default, WinCom selects the traces in the records database. However, you can select other files such as user parameters, colors, channel plans, etc.
4. Once you have selected the file, click OK. In the Save As window, choose a file name and directory. WinCom saves the file with the correct file extension according to the type of data you have selected. See Table 3-1 on page 3-2 for a list of files and their extensions.
5. Click Save to begin retrieving the data from the remote analyzer.
6. For archival storage you may proceed to copy some or all of the desired traces by clicking on the copy or copy all buttons to move the traces from the right pane to the left pane of the WinCom database.

To copy a trace from WinCom to a remote analyzer:

1. Log on to an AT2000 series analyzer (see section 2.6.1 on page 2-8).
2. Click on copy to move the traces within the file from the WinCom database content (left pane) to the records database (right pane), (see Figure 3-5: WinCom Database File Management Window). The traces selected and copied to the records database will be the ones that will get moved over to the remote analyzer.
3. Click Update in the File transfer area in the center of the WinCom screen, or select Update from the Communication menu.
4. In the file selection dialog choose the specific file you want to upload to the remote analyzer. You must choose a file with the correct file extension, according to the type of data you have selected. See Table 3-1 on page 3-2 for a list of files and their extensions.

By default, WinCom selects the traces in the records database file. However, you can select other files such as user parameters, colors, channel plans, etc

5. Click OK to begin copying the traces in the file to the remote analyzer.

Warning: Any files you upload from WinCom to the AT2000 will overwrite the files with the same name on the remote analyzer. Data on the analyzer will be lost. This action cannot be undone.

3.6 Creating and Updating Database Files (WinCom)

WinCom's Copy Trace options can be used to create and edit records database files and WinCom database files without logging on to an AT2000 analyzer. This "offline" mode is useful for organizing records in the WinCom database or the records database. Once you are ready to transfer files or individual records, log on to an AT2000 series analyzer. The analyzer's current Records Database file appears in the Traces pane on the right. You can now add to this remote database by copying traces from the WinCom database to the remote AT2000.

To copy traces with WinCom, you need to use the two panes in the main interface:

WinCom Database Frame — On the left side of the window, the WinCom database pane lists the traces in the current WinCom database file.

Traces Frame — On the right side of the window, the Traces pane lists the traces in the current Records.bin database file on a remote analyzer or in a records database file on your computer. If no records database is selected, this pane is empty (see Figure 3-5). You can add traces to this pane to update a database (see section 3.6 on page 3-8).

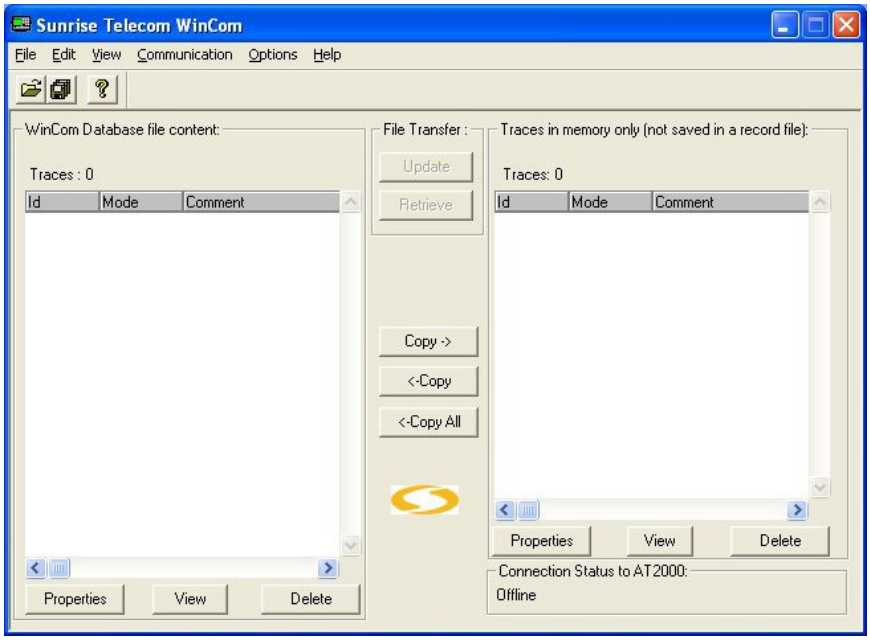


Figure 3-5: WinCom Database File Management Window

3.6.1 Creating and Updating a Records Database File

You can use stored records on your computer to create or update a records database file. This new or updated database file can then be uploaded to a remote analyzer when you are ready.

To create or edit a records database file:

1. Open the records database (see section 3.4.1) or the WinCom database (see section 3.4.2) that contains the records you want to include in your new or updated records database.
2. Select a record from the right pane (WinCom Database), and then click Copy. If you are editing a records database, you can also remove records. First, select the record(s) in the right pane then press Delete on your keyboard, or click the Delete button in the right pane. The records in your new records database appear on the right in the Traces pane. These records are stored in volatile memory until they are saved.

Note: To select multiple records, press the Shift key or the Ctrl key before you click Copy or Delete.

3. Repeat step 2 until you have all of the records you need in the list of traces.
4. Save your changes.
   - To save the new records database file, go to the File menu and select Save, then Records Database. Choose a name for the file and click OK. You must keep the extension .bin.
   - To save changes to an updated records database, select Save As, then choose the name of your existing records database. Confirm the update by selecting Yes when you are asked if you want to overwrite the existing file.

3.6.2 Creating and Updating a WinCom Database File

You can use stored records on your computer to create a new WinCom database file or add to an existing WinCom database. When no WinCom database file has been specifically opened, an empty untitled database is created.

To create or edit a WinCom database file:

1. Open a records database (see section 3.4.1) that contains the records you want to include in your new WinCom database.
2. Select a record from the right pane (Records Database), and then click Copy. If you are editing a WinCom database, you can also remove records. First, select the record(s) in the left pane then press Delete on your keyboard, or click the Delete button in the left pane. The records now appear in the left, in the WinCom database file content pane, as an untitled database. These records are stored in volatile memory until they are saved.

Note: To select multiple records, press the Shift key or the Ctrl key before you click Copy or Delete. To copy records from more than one records database file, close the current records database first and then open another one. Repeat step 2 until you have all the records you need.

3. Repeat step 2 until you have all of the records you need for your WinCom database.
4. Save your changes.
   - To save the new WinCom database file, go to the File menu and select Save, then select WinCom Database. Choose a name for the file and click OK. You must keep the extension .WCD.
   - To save changes to an updated WinCom database, select Save As, and then choose the name of your existing WinCom database. Confirm the update by selecting Yes when you are asked if you want to overwrite the existing file.

3.7 Viewing and Editing Record Properties (WinCom)

The AT2000 Properties for traces can be viewed and edited with WinCom. The properties include the analyzer's mode, site ID, comments, and the date and time that the trace was captured. The properties appear as they were entered on the analyzer from which the trace originates. A description of the abbreviated analyzer modes appears at the end of this section.

Figure 3-6: Viewing the Properties of a Record

To view or edit the properties of a trace:

1. Select the trace in the WinCom database or in the records database.
2. Click the Properties button in the appropriate pane: left pane for WinCom database, right pane for records database.
3. If desired, edit the user-definable fields. If the record is in a WinCom database, all fields except Mode, Date and Time can be edited. If the record is in a records database, only the Site ID and Comments fields can be edited. See Table 3-2 for a description of the analyzer modes.

Editable Field	Format
Site ID	Up to 8 characters
Comments	Up to 40 characters
User ID	Up to 40 characters
Company	Up to 40 characters

4. Click OK to save your changes, or just click Close to exit the Properties window without making any changes.

Table 3-2: Abbreviated Analyzer Modes Stored in Trace Records

Mode	Description
SA	Spectrum Analyzer Trace
TDM	Time Domain Measurement Trace
SLM1	Signal Level Meter Bar Graph (Frequency Counter)
SLM2	Signal Level Meter Bar Graph (TV Channel Mode)
SLM6	Signal Level Meter Bar Graph (6 channels)
HUM	Hum Modulation Trace
DIST	Distortion Trace
AUTO	Auto Test
DPWR	Digital Power
QAM	QAM Trace
BAS	Bidirectional Alignment Trace
DM	Depth of Modulation
FR	Frequency Response
VID	Video

Chapter 4 TRACEVIEW

ReVeal WinCOM's built-in charting utility, TraceView, utilizes your PC to display the data collected with the analyzer. You can view any .XML trace file in ReVeal WinCOM or you can open a database in WinCom that contains captured traces and double-click on a trace record to open the TraceView utility.

Once you have called up a trace, you can analyze data, print various reports or export measurement data directly to several formats such as .BMP or .CSV. For AT2500 series traces, the traces can be exported directly from TraceView to proof of performance reports such as VeEX PoP (.CSV) or FamilyWare (.TSD). For AT2000 traces, you must first export the traces to an ASCII file (.CSV), and then import this file into the VeEX preformatted Excel file (VeEXPoPMacros.xls) that includes macros for formatting data from .CSV files.

This chapter explains the functions for analyzing, printing and exporting data from the TraceView utility.

4.1 Viewing Trace Records

You can call up a trace record in either WinCom or ReVeal WinCOM. WinCom opens records captured with the AT2000 series analyzer in the 1 MHz to 1 GHz range, whereas ReVeal WinCOM opens .XML records captured with the AT2500 series analyzer in the 1 MHz to 1.5 GHz range.

4.1.1 Viewing AT2000 Traces

To view traces that were captured with an AT2000 series analyzer, you need to launch WinCom before you can use the TraceView utility.

1. In ReVeal WinCOM, go to the Tools menu and select Launch WinCom.
2. Use the File menu and open any records file (.BIN) or database file (.WCD) that contains traces.
3. Double click on a trace in the file to open the TraceView utility and display the trace.
4. To view another trace from the same records file or database file, select Recall Records from the View menu to display the list of records in the most recently opened file. If the toolbar is displayed, you can click the Recall button.
5. To open a trace from a different file, select Open Database from TraceView's File menu, and then select a records file (.BIN) or database file (.WCD). When the list of records appears, select a trace and click Display to view it in the TraceView window.

4.1.2 Viewing AT2500 Traces

To view traces that were captured with an AT2500 series analyzer, use ReVeal WinCOM's View menu. This opens the Trace View utility.

1. In ReVeal WinCOM, browse to the directory where your traces are stored.
2. Highlight any .XML file that is a trace. If the trace you would like to view is that of a video trace (ie. a trace with the file extension .vid.xml, then proceed to section 4.3.6 on page 4-9.
3. Go to the View menu and select Trace.

Note: You can also click the View button or simply press F7 on your keyboard when the trace is selected.

If the .XML trace file being viewed is that of a multiple trace display, one can turn on and off, each of the 4 possible traces within the display, by selecting the trace and checking on the trace to display and checking off the trace to hide. See Figure 4-1 below.

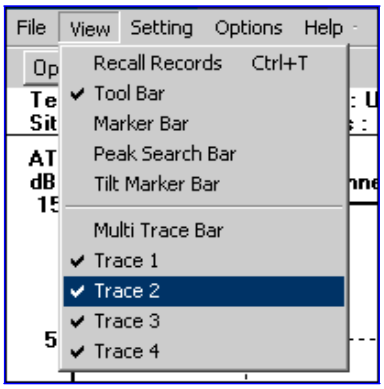


Figure 4-1: Viewing multiple traces

In addition, if the Multi Trace Bar is checked on, the displayed file will reveal the bar allowing the user to select via the individual trace buttons, which of the multiple traces is to be displayed. See Figure 4-2 below.

Figure 4-2: Multi trace bar

4. To view another trace file, go back to ReVeal WinCOM's main window and highlight a different
.XML file. Do not use the recall button unless you want to view a trace captured with an AT2000 series analyzer.

4.2 Spectrum Analyzer Instrument Settings

In order to help you analyze the information that is on screen, the ReVeal WinCOM software provides control over many spectrum analyzer display parameters when you are viewing a trace. For example, you can change the units of measure or set markers. However, the changes you make to the display parameters only apply to ReVeal WinCOM's TraceView. None of the stored traces are affected, and no new settings are saved with the trace.

This section explains how to change certain display settings for a trace, such as:

- vertical scale
- reference level
- markers

4.2.1 Vertical Scale

ReVeal WinCOM displays traces on a graticule with 10 dB per division. You can, however, change the scale on the vertical axis of the graticule in order to zoom in on the signal.

To change the vertical scale:

1. Go to the Setting menu and select Vertical Scale.
2. Choose how many decibels per division you want to use. Each division can be 2 dB, 5 dB, or 10 dB.
3. Click OK to view the trace with the new vertical scale settings.

   When you change the vertical scale, ReVeal WinCOM repositions the signal. For example, if you chose a smaller scale, ReVeal WinCOM hides the upper and lower portions of the signal. You may also want to change the reference level in order to view a particular portion of the signal. Note that the reference level choices reflect the number of decibels per division.

4.2.2 Reference Level

When ReVeal WinCOM displays a trace, it uses the same reference level that was active on the spectrum analyzer when the trace was captured. However, if you change the vertical scale, you may need to change the reference level in order to view a specific portion of the signal.

To change the reference level:

1. Go to the Setting menu and select Reference Level.
2. Choose the reference level from the drop down list. The choices that are available reflect the vertical scale you are using and the upper and lower limits of the spectrum analyzer display at the time the trace was captured. For example, if you have selected a 2 dB per division scale, then you can set the reference level in steps of 2 dB.
3. Click OK to apply the new reference level. When you change the reference level, ReVeal WinCOM repositions the signal. If you do not see the portion of the signal you are interested in, select another reference level.

4.2.3 Markers (vertical, horizontal, peak, and tilt)

View Marker Bar

If you use markers frequently, you can display the marker toolbar that provides shortcuts to activating the vertical and horizontal markers. To display this toolbar, go to the Settings menu and select View Marker Bar.

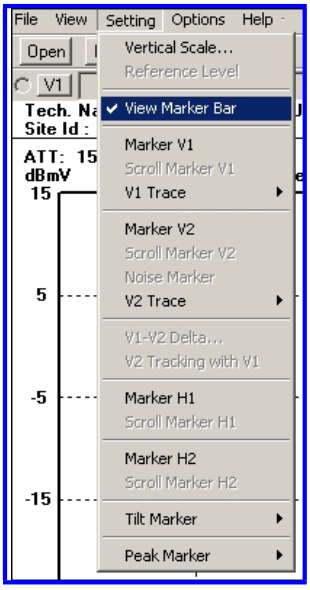


Figure 4-3: Settings menu

When a checkmark appears next to this option, the feature is active and the marker bar will appear as in the figure below. To hide the marker bar, go back to the Settings menu and select View Marker Bar again. The checkmark disappears, indicating that the marker bar is now disabled.

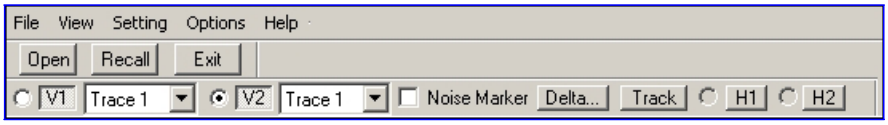


Figure 4-4: Marker bar

Markers (Vertical, Horizontal and Noise)

ReVeal WinCOM includes two vertical markers, two horizontal markers and a noise marker to set level and frequency references. The vertical V1 and V2 markers indicate the frequency and in certain appropriate spans, the level is also displayed. When both vertical markers are selected and displayed on the screen, the frequency and level deltas are automatically calculated. Instead of marker V2, you can choose to use the noise marker. When the noise marker is selected, ReVeal WinCOM displays the noise in dB per Hz of the selected frequency.

When both horizontal markers are displayed on screen, ReVeal WinCOM automatically calculates the delta levels, which can be useful for peak-to-valley measurements

To turn on a marker:

1. Go to the Settings menu and select a marker: Marker V1, Marker V2, Marker H1, Marker H2 or Noise Marker. You can activate both vertical markers and both horizontal markers at the same time, but you cannot activate the Noise Marker at the same time as Marker V2. Alternatively, the marker bar can be used to activate the markers by selecting the marker buttons. When used in association with a multiple trace display, one can select the specific

trace for which the markers are being used, via the drop down menu next to the vertical marker buttons.

2. A checkmark appears next to the active marker(s). To disable a marker, go back to the Settings menu and select the marker again. The checkmark disappears, indicating that the marker is now disabled. Alternatively, if the marker bar was being used, select the marker again to disable it.

3. Set your markers to the desired position by using the scroll bars at the bottom and on the right side of the screen (see next section).

Marker Scroll

The Scroll Marker choices in the Settings menu let you choose which marker is moved when you use the vertical or horizontal scroll bars at the bottom or on the right side of the screen.

This feature is only active when you are using the associated marker. By default, ReVeal WinCOM activates the scroll function on the first marker you select. You can activate the scroll function on one vertical marker and one horizontal marker at the same time, but you cannot activate the scroll function on both vertical markers or on both horizontal markers. When the marker bar is being used, the scrolling function will only apply to the marker which has the small bullet icon next to it.

To activate the scroll function on markers:

1. Activate one or more markers (see preceding section).

2. Go to the Settings menu and activate the scroll function on a marker: Scroll Marker V1, Scroll Marker V2, Scroll Marker H1 or Scroll Marker H2. A small bullet appears to the left of the menu choice to indicate which marker you are moving when you use the scroll bars.

3. To disable scrolling on a marker, either disable the marker or activate the scroll function on another marker of the same type. For example, to disable scrolling of marker V1, select Scroll Marker V2. ReVeal WinCOM automatically disables the scroll function on Marker V1.

4. Use the vertical or horizontal scroll bars to move the associated marker. For vertical markers, use the scroll bar at the bottom of the screen. For horizontal markers, use the scroll bar on the right side of the screen. The signal remains centered in the window.

5. A user may also input a preset delta value between the two vertical markers by selecting the V1-V2 delta option in the Settings menu, or selecting the Delta button in the marker bar. Either mode of selection will bring up the following dialog as shown in the figure below. The delta option allows the user to lock V2 to V1 at a specific frequency delta or offset so that both markers move together.

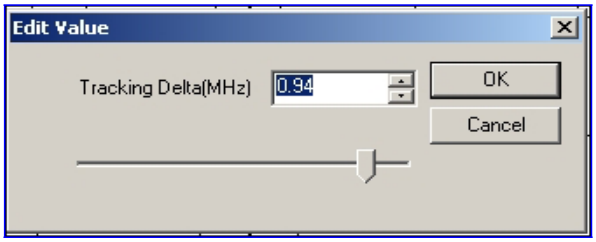


Figure 4-5: Tracking Delta dialog

6. The Track button must be toggled on so that the delta frequency between V2 and V1, defined in the previous step, establishes the locking of V2 to V1. Alternatively, the user may select the V2 tracking with V1 selection in the Settings menu to achieve the same functionality. When the scroll bar at the bottom of the screen is used, V2 and V1 will scroll together, with the delta frequency set between them, maintained. To disable the tracking of V2 to V1, click on the Track button to toggle off the functionality, or alternatively toggle off the V2 tracking with V1 selection in the Settings menu.

Peak Search Marker

The peak marker may be used to identify the various peak levels for a specific trace.

1. Go to the Settings menu and select the Peak Marker menu item, and then select the View Peak Search Bar menu item. Alternatively, the Peak Search Bar may be activated by selecting the menu item from the View menu. In either case, a check mark appearing next to the Peak Search Bar menu item indicates that this feature is active and will appear as in the figure below.

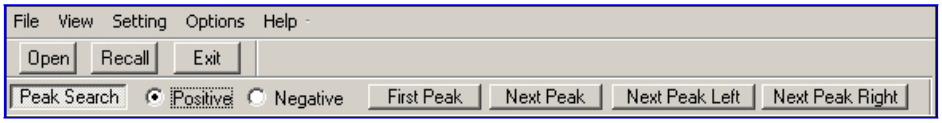


Figure 4-6: Peak Search Bar

2. Select the Positive or Negative peak search option within the Peak Search Bar. The small bullet will appear next to the active mode.
3. Select the First Peak button to select the highest peak when in the Positive mode, and the lowest peak in the Negative mode.
4. Select the Next Peak Left to find the next peak to the left of the current peak.
5. Select the Next Peak Right to find the next peak to the right of the current peak.

Tilt Marker

1. Go to the Settings menu and select the Tilt Marker menu item, and then select the View Tilt Marker Bar menu item. Alternatively, the Tilt Marker Bar may be activated by selecting the menu item from the View menu. In either case, a check mark appearing next to the Tilt Marker Bar menu item indicates that this feature is active, and will appear as in the figure below.

Figure 4-7: Tilt Marker Bar

2. Within the Tilt Marker Bar, select the Tilt Marker Shown button to show the active tilt marker.
3. Select the Tilt Low Freq button to set the low frequency reference value in the dialog that appears.
4. Select the Tilt High Freq to set the high frequency reference value in the dialog that appears.
5. Select the Low Freq Level to set the low frequency level (in dBmV) reference value in the dialog that appears.
6. Select the Tilt Offset to set the desired tilt level (in dB) reference value.

4.3 Defining Custom Settings for TraceView

TraceView can be customized so you can use the colors, temperature units and other units of measure that you want to. You can also show or hide toolbars.

This section explains how to change the settings of:

- colors
- temperature units
- display units
- toolbar display

4.3.1 Customizing the TraceView Colors

The color of the items displayed in TraceView can be customized to help you view and print the captured data.

To select a color scheme or custom colors:

1. Select Colors from the TraceView Options menu.

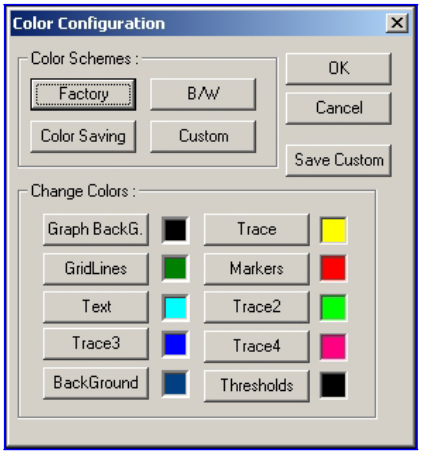


Figure 4-8: Choosing Color Options

2. Choose one of the four predefined color schemes:

Scheme	Description
Factory Default	This is the factory default color scheme, and is similar to the default indoor colors used on the spectrum analyzer.
B/W	This is a black and white color scheme. When printing on monochrome printers, a black and white scheme may be most suitable. Dark areas are minimized in order to conserve toner or ink.
Color Saving	This scheme limits the use of colors. It uses some color for traces, gridlines and markers while keeping everything else black and white to conserve toner or ink when printing.
Custom	This is a user-defined custom color scheme. Selecting this option restores the custom settings that were saved. Only one custom scheme can be saved in ReVeal WinCOM.

3. If you want to use your own color scheme, start with the color scheme that is closest to what you want to use, and edit the component(s). The current color appears in a small box next to the item. To change this color, click on the item and select a new color from the choices. You can also create custom colors instead of choosing a predefined color.

   There are eight editable screen components:

Component	Description
Graphic Background	This is the color of the graticule's background. Choose a color that allows enough contrast with the grid lines, traces, markers and thresholds.
Grid Lines	This is the color of the dotted grid lines.
Text	This is the color of the text that appears outside of the graticule.
Background	This is the color of the margin around the graticule, where text is shown. Choose a color that allows enough contrast with the text color.
Trace	This is the color of the captured trace or QAM signal.
Markers	This is the color of the vertical and horizontal markers and the zoom marker in QAM mode.
Trace2	This is the color of the second trace.
Trace3	This is the color of the third trace.
Trace4	This is the color of the fourth trace.
Thresholds	This is the color of the limit lines.

4. Once you have made your changes, click Save Custom to record your color scheme.

4.3.2 Choosing a Temperature Unit

The data captured with the spectrum analyzer includes the ambient temperature when the trace was captured. You can choose either Fahrenheit or Celsius in TraceView.

To change the temperature units:

1. Go to the Options menu and select Temperature Units to display the choices. A small bullet appears to the left of the menu choice to indicate which temperature unit is currently in use.
2. Select either Celsius or Fahrenheit. When you release the mouse, the TraceView display is updated with the new temperature units.

4.3.3 Display Units

The vertical axis on data captured with the spectrum analyzer is usually in dBmV (decibel referenced in a millivolt). You can change the units on the vertical axis to dBµV (decibel referenced in a microvolt) through TraceView's options menu.

To change the display units:

1. Go to the Options menu and select Display Units to display the choices. A small bullet appears to the left of the menu choice to indicate which temperature unit is currently in use.

2. Select either dBmV or dBµV. When you release the mouse, the TraceView vertical axis is updated with the new units.

4.3.4 Setting the Date Format

The data captured with the spectrum analyzer includes the date the trace was captured. You can choose between long and short International formats (day, month, year) or US long and short formats (month, day, year). To change the date format, see section 2.6.2 on page 2-9. Once you change the format, TraceView updates the date display on any traces that you are viewing.

4.3.5 Using the TraceView Toolbar

The Toolbar item controls whether or not the toolbar is displayed. The Toolbar provides quick access to frequently used commands.

To display the toolbar:

1. Go to the View menu and select Toolbar.
2. A checkmark appears to the left of this menu item to indicate that it is active, and the TraceView toolbar buttons (Open, Recall and Exit) appear in the upper part of the window. To hide the toolbar, select the Toolbar item again. The checkmark should disappear as well as the buttons.

4.3.6 Viewing Video Traces

This section has been included in the manual to differentiate all other trace displays from those of video traces (trace files with the .vid.xml extension), due to differences in the toolbar selections and the overall difference in look and feel for displayed video traces.

1. In ReVeal WinCOM, browse to the directory where your traces are stored.
2. Highlight a .vid.xml file that is a video trace. The captured video trace may be that of a waveform monitor display as in Figure 4-9 or a vectorscope display as in Figure 4-10.
3. Go to the view menu and select Trace.

Note: You can also click the View button or simply press F7 on your keyboard when the trace is selected. Alternatively, double-clicking the left mouse button will allow you to view the trace.

4. Proceed to step 5 if the video display is that of a waveform monitor, or to step 10 if the video trace is that of a vectorscope display.

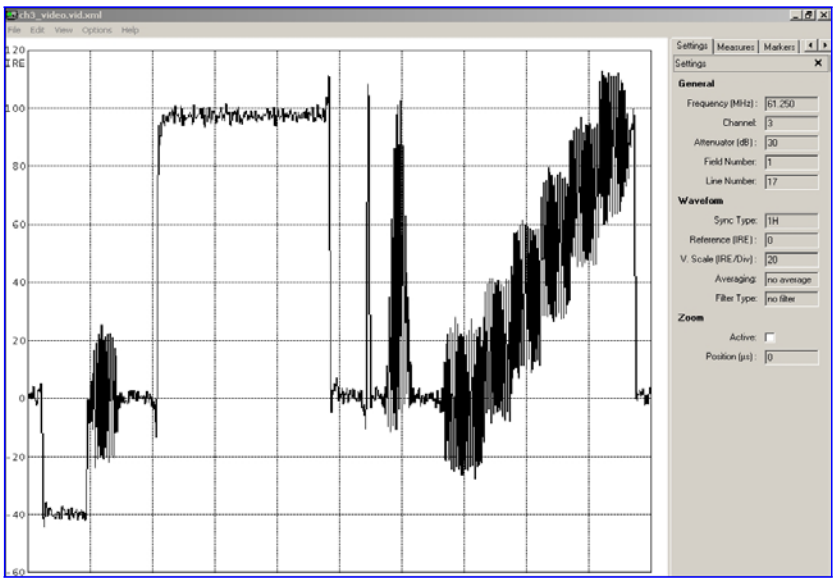


Figure 4-9: Viewing a video trace (waveform monitor)

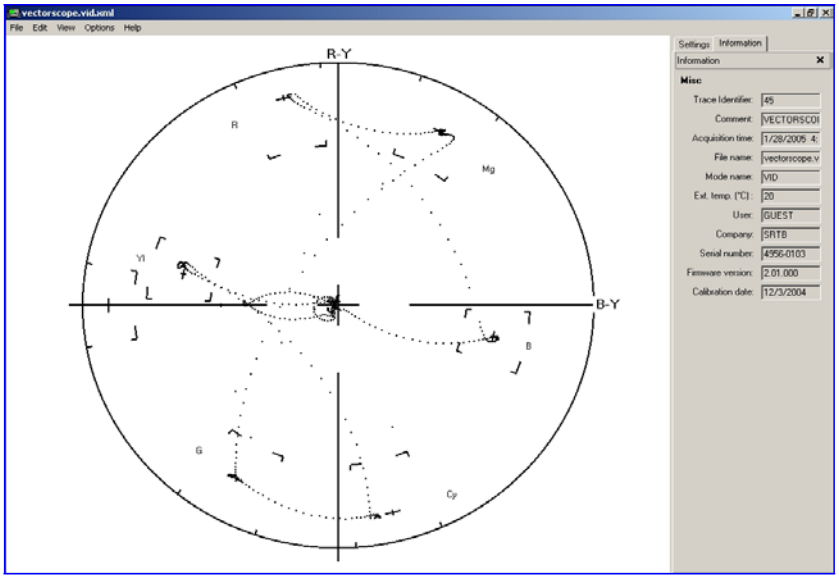


Figure 4-10: Viewing a video trace (vectorscope view)

5. To enable or disable the individual options available for a given video trace (waveform monitor), ensure that the options under the View menu item have been checked on or off, respectively. The options included for viewing are Settings, Markers, Measures and Information. The tab for the specific option will appear on the upper right hand side, next to the video trace.

6. Click on the Settings tab to view general and specific waveform settings for the stored video trace. As well, it can be determined if the Zoom feature was active when the trace was stored by the appearance or absence of a checkmark within the box.

7. Click on the Measures tab to view measurement results for Y/C luminance chrominance delay and gain, Depth of Modulation (if selected at time of measurement), Modulation Linearity (if selected at time of measurement), Signal to Noise.

8. Click on the Markers tab to enable the individual horizontal (H1 and H2) markers, as well as the individual vertical (V1 and V2) markers. The delta value for the horizontal markers

will become visible when both H1 and H2 markers are enabled. As well, the delta value for the vertical markers will become visible when both V1 and V2 are enabled.

9. Click on the Information tab to view specific information regarding the trace and additional parameters regarding the analyzer which captured the trace.

10. To enable or disable the individual options available for a given video trace (vectorscope display), ensure that the options under the View menu item have been checked on or off, respectively. The options included for viewing are Settings, and Information. The tab for the specific option will appear on the upper right hand side, next to the video trace.

11. Click on the Settings tab to view general and specific settings for the stored video trace in the vectorscope display

12. Click on the Information tab to view specific information regarding the trace and additional parameters regarding the analyzer which captured the trace.

4.3.7 Customizing the Video Trace Colors

1. In the Options menu of a video trace, select Colors.

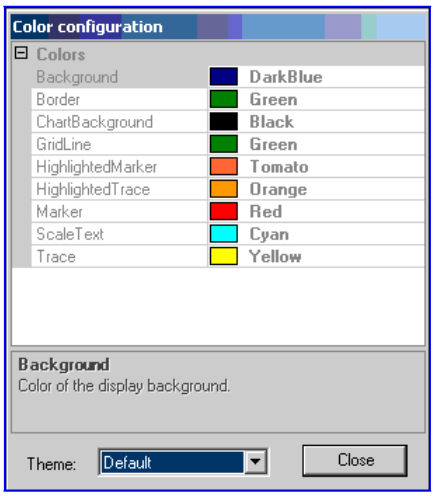


Figure 4-11: Choosing color options for video traces

2. Choose one of three defined color schemes:

Scheme	Description
Factory Default	This is the factory default color scheme, and is similar to the default indoor colors used on the spectrum analyzer.
B/W	This is a black and white color scheme.
Custom	This is a user-defined custom color scheme.

3. If you want to use your own color scheme, start with the color scheme that is closest to what you want to use your own color scheme that is closest to what you want to use, and edit the components. The current color appears in a small box next to the item. To change this color, click on the drag down button appearing to the right of the color selection.

4. Choose one of the three color palettes, namely; Custom, Web, System.

5. Select a color from within the chosen palette. Alternatively, you may simply overwrite the color that appears and type in the name of the color you would like to you use.

   There are nine editable screen components.

Component	Description
Background	This is the color of the margin around the graticule, where text is shown. Choose a color that allows enough contrast with the text color.
Border	This is the color of the graph border color.
Chart(Graph)Background	This is the color of the chart (graph) background.
Grid Line	This is the color of the dotted grid lines.
Highlighted Marker	This is the color of the marker which is highlighted when the cursor is passed over it.
Highlighted Trace	This is the color of the trace which is highlighted when the cursor is passed over it (ex. a Vectorscope display which can be manipulated).
Marker	This is the color of the marker.
Scale Text	This is the color of the chart text.
Trace	This is the color of the trace.

4.4 Viewing QAM Data

You can call up a QAM record in either WinCom or ReVeal WinCOM. WinCom opens records captured with the AT2000 series analyzer in the 1 MHz to 1 GHz range, whereas ReVeal WinCOM opens .XML records captured with the AT2500 series analyzer in the 1 MHz to 1.5 GHz range.

Once you have called up a QAM record, you can change viewing options (see section 4.3 starting on page 4-7) and print the record (see section 4.5 on page 4-17) just like any trace record. In addition to these standard features, ReVeal WinCOM offers extra controls for analyzing QAM records, as described in this section.

4.4.1 Zooming in on a Constellation

You can zoom in on a portion of the QAM constellation once you call up a QAM record.

To zoom in on a QAM constellation:

1. Call up the QAM constellation you want to view (see section 4.1 on page 4-1).
2. Move your mouse to mark any frame of the constellation. To zoom in, click the left mouse button once.
3. To keep zooming in, repeat step 2.
4. To zoom out, click the right mouse button.
5. To keep zooming out, repeat step 4.

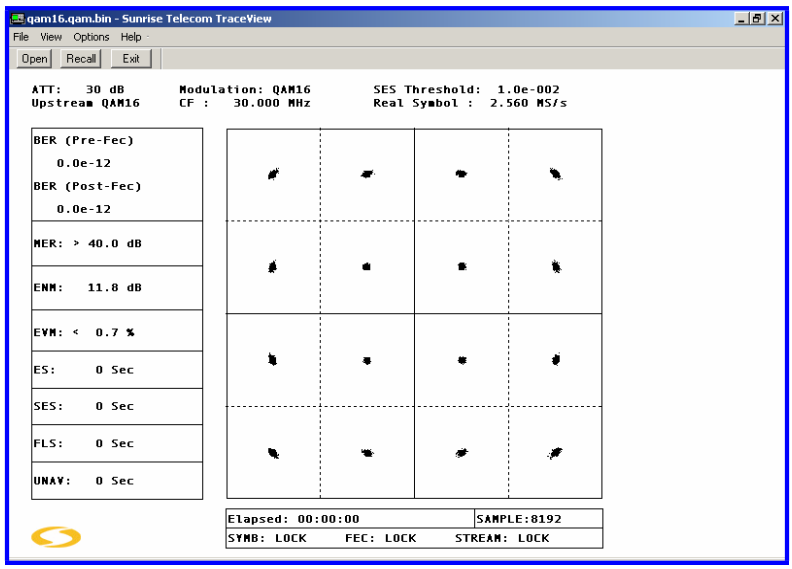


Figure 4-12: Viewing QAM Constellation

4.4.2 Viewing Statistical Data

If you are viewing QAM statistical data that was captured over a period of time with the spectrum analyzer, you can zoom in on a particular time.

To view statistics for a particular time:

1. Call up the trace or QAM image you want to print (see section 4.1 on page 4-1).
2. In the top part of the window, use the Screen Width field to change the window you are observing. By default, ReVeal WinCOM displays the full statistical period.
3. In the Go To field, enter the elapsed time that you want to view. For example, if the statistics were taken over 2 minutes, you can view the statistics at the one-minute mark. Use the plus and minus buttons to scroll forward and backward in time.

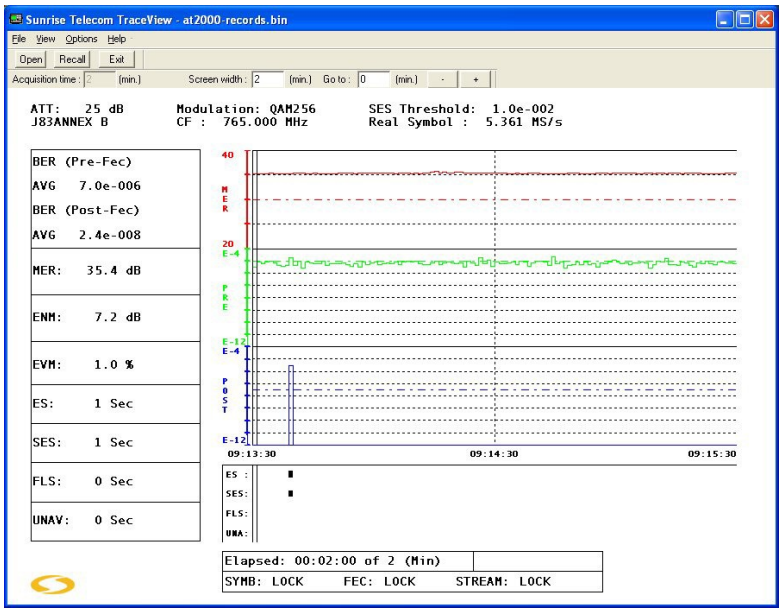


Figure 4-13: Viewing QAM Statistics

4.4.3 Viewing the Adaptive Equalizer Display

You can view the adaptive equalizer display once you call up a QAM record.

There are three different displays in the equalizer screen:

- A bar graph showing the 32 coefficients: 8 feed-forward Equalizers (FFE) and 24 Decision Feedback Equalizers (DFE). The eighth coefficient is the main signal path so it is normally very close to 0 dB (unity gain)
- A frequency response graph (from +5 to –3 dB) over the defined channel bandwidth.
- A group delay graph showing the delay in nsec across the channel bandwidth.

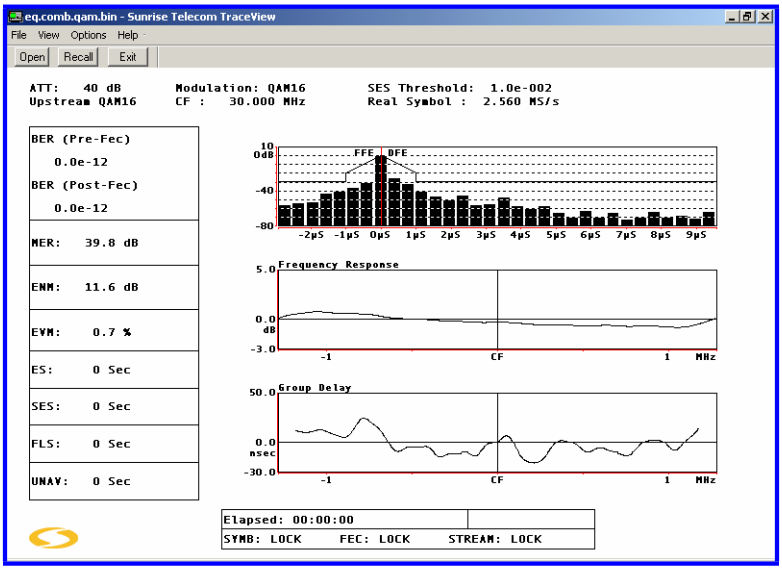


Figure 4-14: Viewing the Adaptive Equalizer Display

Each of the three displays can be viewed individually by placing the cursor over the desired display and clicking the left mouse button. Once the specific display is chosen, an enlarged view will be presented. To return to the combined view, simply click on the right mouse button.

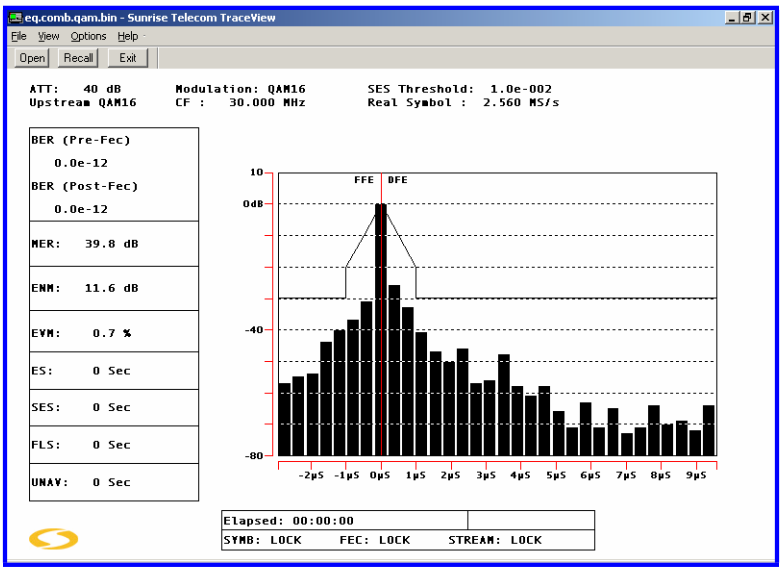


Figure 4-15: Equalizer Display

When selecting the frequency response graph, vertical and horizontal markers are available to perform specific measurements such as peak to valley of the frequency response plot, as shown below.

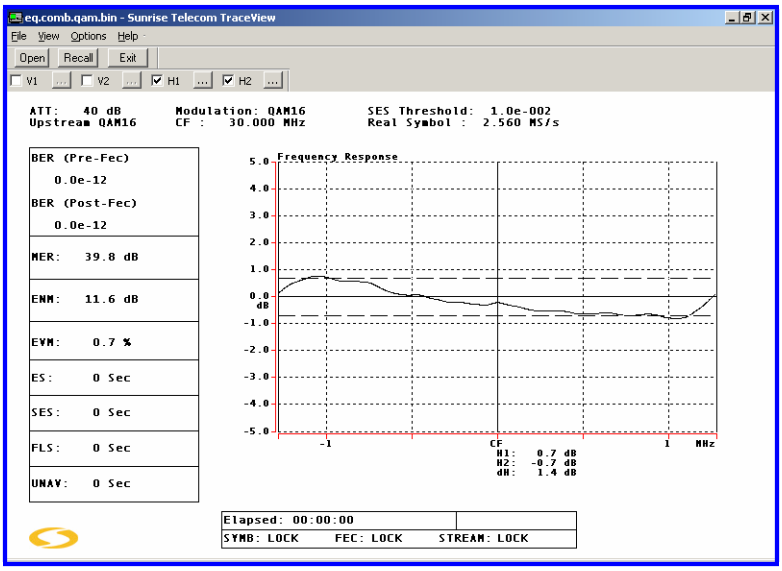


Figure 4-16: Frequency response display (with horizontal markers selected)

When selecting the group delay graph, vertical and horizontal markers are available to perform specific measurements. When both the vertical V1 and V2 markers are used, the delta values in both frequency and time are displayed. Additionally, the slope of the curve between marker points is indicated in ns/MHz.

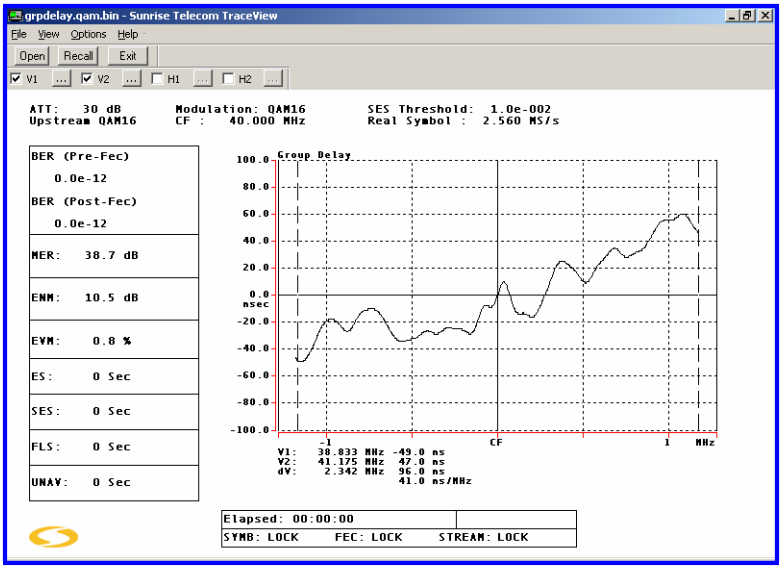


Figure 4-17: Group delay display (with vertical markers selected)

4.4.4 Using the QAM Mode Toolbar

The QAM Bar item controls whether or not the QAM toolbar is displayed. The QAM toolbar provides quick access to the Export command.

To activate the QAM toolbar:

1. Go to the View menu and select QAM Bar.
2. A checkmark appears to the left of this menu item to indicate that it is active, and the QAM toolbar buttons (Mode, Filter, Disable Grid, Disable Template, Setup and Export) appear in the upper part of the window. Only the Export button is active. If you are viewing a QAM constellation or statistical data captured with the spectrum analyzer, click Export to save the data in an ASCII file. See section 4.6 on page 4-19 for detailed instructions.

Note: You cannot export QAM data to VeEX PoP (.CSV) or FamilyWare (.TSD). You can, however, export the image to a .BMP format for use as an image in another application (see section 4.6.4 on page 4-21).

3. To hide the toolbar, select the QAM Bar item again. The checkmark should disappear as well as the buttons.

4.5 Printing Reports and Screens

Once you have set up your printer, you can print any image on your screen. You can also tag multiple records and print them all at once.

4.5.1 Defining the Print Setup

ReVeal WinCOM's Print Setup lets you choose the target printer, set up its properties, select paper size, paper source, and page orientation.

To set up your printer:

1. From TraceView's File menu, select Print Setup.

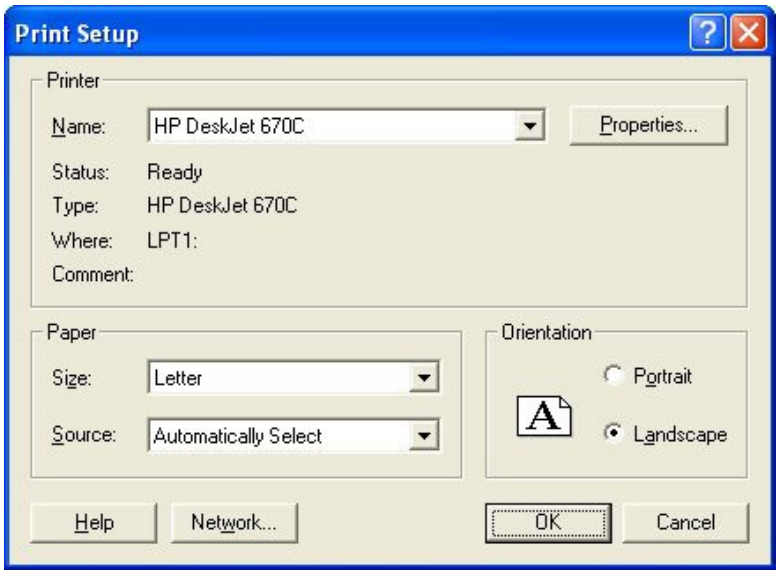


Figure 4-18: Setting up a Printer

2. Once you have made your changes, click OK to record your setup. ReVeal WinCOM will use this setup when you print an image (see section 4.5.3).

4.5.2 Using the Print Preview

ReVeal WinCOM's Print Preview displays the image the way it will appear when printed. Use this preview to verify the image and page settings before printing.

To preview a trace before printing:

1. Call up the trace you want to view (see section 4.1 on page 4-1).
2. From TraceView's File menu, select Print Preview. The trace now appears on screen.
3. From the Preview mode, you can print the trace by selecting the Print button, or zoom in on a portion of the image using the Zoom In button. To exit the Print Preview, click the Close button.

4.5.3 Printing a Screen

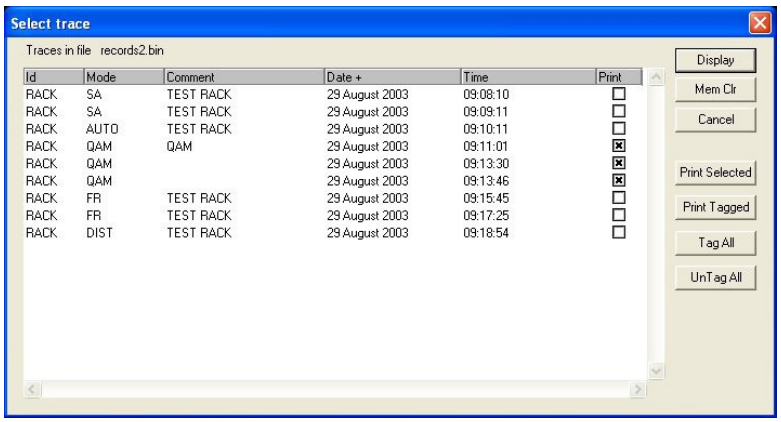
To print the image on your screen:

1. Call up the trace or QAM image you want to print (see section 4.1 on page 4-1).
2. Go to the File menu and select Print. ReVeal WinCOM immediately sends the data to the printer that is defined in your printer setup. To change the printer setup, see section 4.5.2.

4.5.4 Printing Multiple Records

To print multiple records from a WinCom database or records file:

1. From ReVeal WinCOM, launch WinCom.
2. Open the WinCom database or the records file containing the traces that you want to print. See section 3.4 on page 3-5 to select a database or records file.
3. In the Select Trace window, tag the records in the WinCom database or the records file that you want to print as follows:
   - To select a few records in the file, check the box in the Print column. Adjust the column width if necessary until you see the Print column. You can click on any column to sort the records, for example, by date or mode.
   - To select all of the records in the file, click Tag All. To change your choice, click Untag All.



Id	Mode	Comment	Date +	Time	Print
RACK	SA	TEST RACK	29 August 2003	09:08:10	☐
RACK	SA	TEST RACK	29 August 2003	09:09:11	☐
RACK	AUTO	TEST RACK	29 August 2003	09:10:11	☐
RACK	QAM	QAM	29 August 2003	09:11:01	☒
RACK	QAM		29 August 2003	09:13:30	☒
RACK	QAM		29 August 2003	09:13:46	☒
RACK	FR	TEST RACK	29 August 2003	09:15:45	☐
RACK	FR	TEST RACK	29 August 2003	09:17:25	☐
RACK	DIST	TEST RACK	29 August 2003	09:18:54	☐

Figure 4-19: Printing Tagging Records

4. Once you have selected the records, click Print Tagged. WinCom sends the data to the printer that is defined in your printer setup. To change the printer setup, see section 4.5.1.

4.6 Exporting Data

The data you capture with a VeEX spectrum analyzer includes the model and serial number, most recent factory calibration date of the instrument as well as basic information such as date, time, temperature, company name and user name. This data is stored with the trace and is transferred to WinCom or ReVeal WinCOM when you download files from the spectrum analyzer. The measurement results can then be exported directly into several formats:

- a comma separated value (.CSV) file format for use in a spreadsheet program
- a .BMP file to be pasted into another application
- a VeEX POP format
- a .TSD file on your PC, that is then imported into FamilyWare

Important: For FCC exports, make sure you enter the site ID in the spectrum analyzer in the correct format so that software can recognize the formatting and populate the proper cells.

4.6.1 Exporting a Single Trace to ASCII Format (CSV)

The Export in ASCII function converts data into a comma delimited text file (CSV) format that can be imported into spreadsheet programs. If you use Excel, you can make use of VeEX's proof of performance (POP) macro, included with ReVeal WinCOM.

To export a single trace to an ASCII file (CSV format):

1. Call up the trace you want to export (see section 4.1 on page 4-1).
2. From TraceView's File menu, select Export in ASCII (CSV) format. Browse to the directory where you want to save the trace in ASCII format.
3. Choose a name for the file and click Save. ReVeal WinCOM adds the extension .CSV automatically unless you select another format.
4. Open the file in a spreadsheet program and use its charting functions to analyze the data. You can also open the VeEX preformatted Excel file (VeEXPoPMacros.xls) that includes macros for formatting data from .CSV files. Once you are in the VeEX preformatted Excel file, you can import your .CSV files.

4.6.2 Exporting Multiple Traces to ASCII Format (CSV)

If you want to export multiple traces captured with the AT2000 series analyzer, you need to launch WinCom. The TraceView utility only exports one trace at a time.

To export multiple traces from a WinCom database or records file:

1. From ReVeal WinCOM, launch WinCom.
2. Open the WinCom database or the records file containing the traces that you want to export. See section 3.4 on page 3-5 to select a database or records file.
3. Select the records in the WinCom database or the records file that you want to export.
4. From WinCom's File menu, select Export to CSV, and then choose Selected Record Traces or Selected WinCom Database Traces.

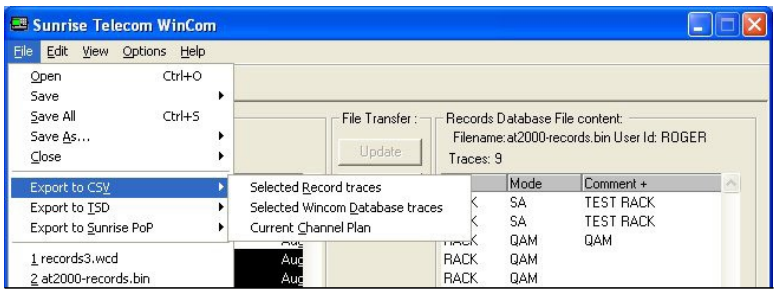


Figure 4-20: Exporting Selected Records to CSV Format

5. In the Select Export Filename window, browse to the directory where you want to save the trace in ASCII format. You can create a new directory by modifying the path shown in the Base Filename field.

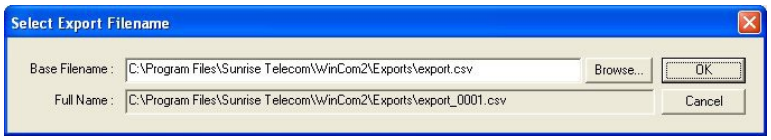


Figure 4-21: Saving Exported Files

6. In the Base Filename field, choose a root file name. Each trace that you export will start with this root filename. WinCom adds a sequential number such as 0001, 0002, etc. so that each exported trace has a unique name.
7. Click OK to begin exporting the files.

4.6.3 Exporting a Channel Plan

In order to use the VeEX Excel Macro FCC POP report, you need to have a channel plan in .CSV format. You can export your current channel plan so you can use it in the report.

To export a channel plan:

1. From ReVeal WinCOM, launch WinCom.
2. From WinCom's File menu, select Export to CSV, then choose Current Channel Plan.

Note: If the current channel plan is not the one you want to use, change the channel plan before you export it. To do so, go to the Options menu and select Current Channel Plan File. Browse to the directory where your channel plan file is located. The file must have the extension .PLN. Once you have loaded the correct channel plan, complete step 2 of this procedure.

3. In the Save As window, browse to the directory where you want to save the exported plan. By default, WinCom saves the file as CHANNELPLAN.CSV in the same directory as your exported traces.
4. Click Save to export the channel plan. You can now import this plan into the VeEX Excel Macro FCC POP report or other spreadsheet program.

Important: For purposes of data integrity, the channel plan should be finalized and used throughout the testing cycle.

4.6.4 Exporting to the Clipboard (BMP)

This function copies the trace display area to the system clipboard in a bitmap format. This is essentially a picture of the trace that can be pasted into other applications such as word processing programs. Only one trace can be exported at a time.

To export a trace to the clipboard (.BMP format):

1. Call up the trace you want to export (see section 4.1 on page 4-1).
2. From TraceView's File menu, select Export to clipboard (.BMP format). The image is now in your Windows clipboard.

Note: You must paste the image (Ctrl-V for most applications) before exporting another trace to the clipboard (.BMP format).

4.6.5 Exporting to the VeEX POP Report

The VeEX proof of performance (POP) report accepts multiple traces captured with the AT2000 series analyzer. You need to launch WinCom first in order to access this feature.

To export multiple traces from a WinCom database or records file to a VeEX POP report:

1. From ReVeal WinCOM, launch WinCom.
2. Open the WinCom database or the records file containing the traces that you want to export. See section 3.4 on page 3-5 to select a database or records file.
3. Select the records in the WinCom database or the records file that you want to export.
4. From WinCom's File menu, select Export to VeEX PoP, and then choose Selected Record Traces or Selected WinCom Database Traces.

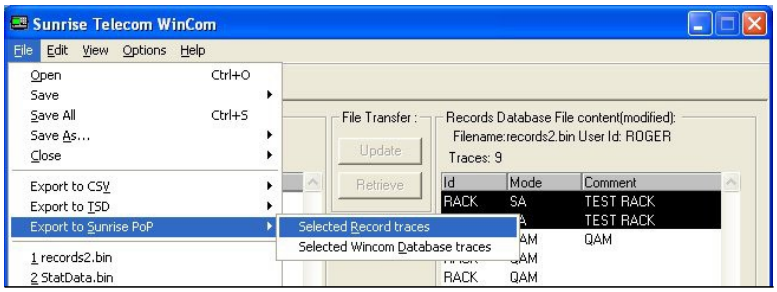


Figure 4-22: Exporting Selected Records or Traces to VeEX POP Report

Note: If there are any records that need additional formatting information for export to a TSD format, WinCom provides a window to edit the identification for the traces. Choose Headend Trace or Test Point Trace and edit the information. Click OK to continue.

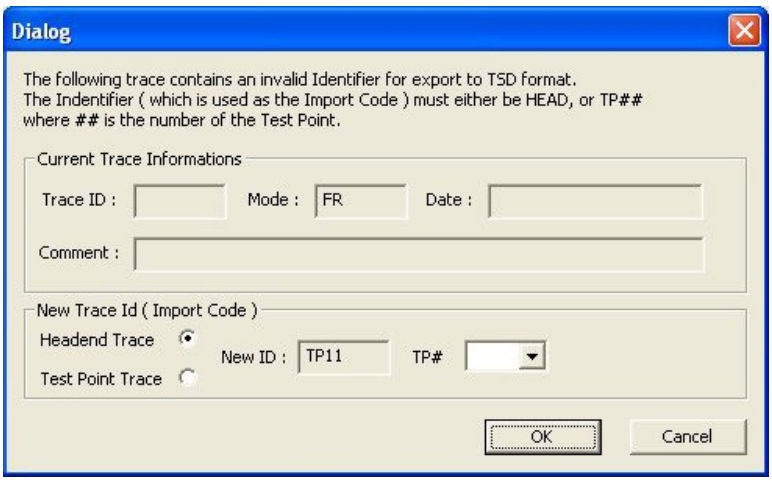


Figure 4-23: Modifying Identification Data for TSD Format

5. Import or edit the system information.

   WinCom prompts you to import information for your cable system that appears in the report header. If you have exported this information into an ASCII format (see section 4.6 starting on page 4-19) as part of a records database, you can import the SystemInfo.csv file now. Click Yes and browse to the directory where your system information is located. The file must have the extension .CSV. If you do not have a system information file, you can enter the information for the VeEX report header now.

   Follow the prompts on screen:
   - company name
   - system name
   - street address (street and municipality)
   - state or province
   - ZIP or postal code
   - number of subscribers
   - number of integrated hubs
   - system bandwidth
   - year of the last triennial test
   - the number of each test channel (1 to 13)

6. Select a channel plan.

   WinCom prompts you for a channel plan.
   - To use the channel plan that was exported with the records, click Yes.
   - To select a different channel plan for your own exported channel plan files, click No and browse to the directory where your channel plan is located. The file must have the extension .CSV. If you have not yet exported a channel plan, see section 4.6.3 on page 4-20. Select the channel plan and click OK to continue.

7. WinCom now opens the VeEX preformatted Excel file and populates the appropriate cells, using the data for your system and the data in the records you selected.

4.6.6 Using the VeEX Preformatted Excel File

The VeEX preformatted Excel file (VeEXPoPMacros.xls) includes macros for formatting data from .CSV files. This Excel file and its macros run automatically when you export to a VeEX POP format. Alternatively, you can open the file from the \VeEX Telecom\Excel Pop Macros directory, and then import your .CSV files.

You can view, print, import and export data from this file:

- To view data, consult each tab in the Excel file to view the summary, headend and test point data.
- To print the page you are viewing, click Print Current Page. You may want to preview the page first to check the page layout. To do so, click Preview Current Page and make any adjustments as necessary from the preview window.
- To import more data into this file, click Import CSV files and select a file with the .CSV extension. For example, you can import channel plans or more traces.
- To export the Excel file to a FamilyWare .TSD format, click Export Data to TSD. WinCom will prompt you for any additional information that may be required such as the channel plan, list of test channels, system information and measurement results.
- To clear the data in the cells and start over, click Clear Current Page. This does not delete the formatting,

4.6.7 Exporting to a FamilyWare File (.TSD)

WinCom supports the FamilyWare .TSD format for proof of performance reporting. You can export traces directly to this format from WinCom. You need to launch WinCom first in order to access this feature.

You can also export data from the VeEX preformatted Excel file to the .TSD format. See section 4.6.6.

To export multiple traces from a WinCom database or records file to a VeEX POP report:

1. From ReVeal WinCOM, launch WinCom.
2. Open the WinCom database or the records file containing the traces that you want to export. See section 3.4 on page 3-5 to select a database or records file.
3. Select the records in the WinCom database or the records file that you want to export.
4. From WinCom's File menu, select Export to VeEX PoP, and then choose Selected Record Traces or Selected WinCom Database Traces.

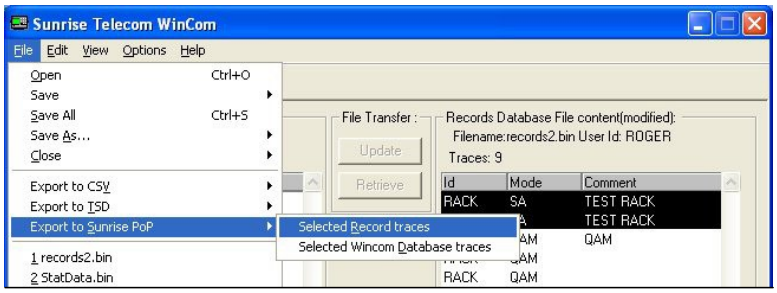


Figure 4-24: Exporting Selected Records or Traces to POP Format

Note: If there are any records that need additional formatting information, WinCom provides a window to edit the identification for the traces. Choose Headend Trace or Test Point Trace and edit the information. Click OK to continue.

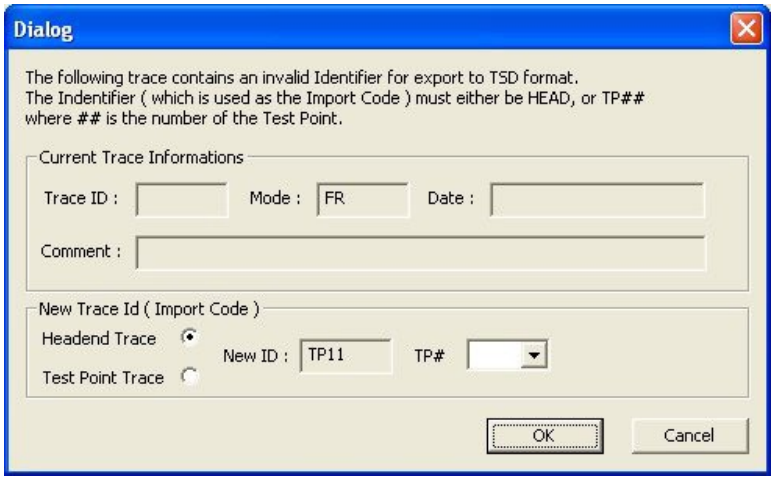


Figure 4-25: Editing dialog

5. Import or edit the system information.

   WinCom prompts you to import information for your cable system that appears in the report header. If you have exported this information into an ASCII format (see section 4.6 starting on page 4-19) as part of a records database, you can import the SystemInfo.csv file

now. Click Yes and browse to the directory where your system information is located. The file must have the extension .CSV. If you do not have a system information file, you can enter the information for the VeEX report header now.

Follow the prompts on screen:

- company name
- system name
- street address (street and municipality)
- state (or province)
- ZIP code (or postal code)
- number of subscribers
- number of integrated hubs
- system bandwidth
- year of the last triennial test
- test channels (1 to 13)

6. WinCom prompts you for a channel plan.
   - To use the channel plan that was exported with the records, click Yes.
   - To select a different channel plan for your own exported channel plan files, click No and browse to the directory where your channel plan is located. The file must have the extension .CSV. If you have not yet exported a channel plan, see section 4.6.3 on page 4-20. Select the channel plan and click OK to continue.

Important: For purposes of data integrity, the channel plan should be finalized and used throughout the testing cycle.

WinCom opens the VeEX preformatted Excel file and populates the appropriate cells, using the data for your system and the data in the records you selected. Consult each tab in the Excel file to view the summary, headend and test point data.

Chapter 5 CHANNEL PLAN EDITOR

The channel plan editor (applicable only to AT2500 channel plans) lets you make changes to an existing plan, or create a new plan either by starting fresh or by copying an existing plan. Use the channel plan editor to define each channel in the plan, such as its position, type, frequency and a selection of VITS parameters to indicate where particular test signals are for most of the CATV tests available.

In addition to standard TV or digital channels, the channel line-up can also include leakage detector pilot signals or data carriers.

Important: For AT2500 series used in conjunction with ReVeal WinCOM s/w version 2.2, alterations can be made to the channel plans while making measurements in the field. S/W version 2.2 provides the ability to import edited channel plans via the Channel Plan Editor, therefore eliminating the need to replicate them exactly on the PC.

Prior to WinComII s/w version 2.2, no alterations to the channel plans can be made while making measurements in the field. If any changes are made in the field, the data will not be exported properly to FCC reports such as the VeEX report or Family Ware POP program. If changes were made in the field, replicate them exactly on the PC that will receive the field traces and produce the FCC report. See section 5.4 on page 5-10 for instructions on editing a channel plan in WinComII.

In either case, for purposes of data integrity, the channel plan should be finalized and used throughout the testing cycle.

5.1 Creating a Channel Plan File

A channel plan file can contain several channel plans. Each plan contains a specific channel line-up that you define. ReVeal WinCOM includes a few sample channel plans (.SCP files) that contain typical channel parameters based on the television standards in various geographical regions. You may want to consult one of the sample channel line-ups before creating your own.

To create a new channel plan:

1. From the ReVeal WinCOM Tools menu, select Launch Channel Plan Editor. By default, ReVeal WinCOM opens either the last channel plan file that was opened, or, if this is the first time you are using the Channel Plan Editor, it opens a blank channel plan file window.

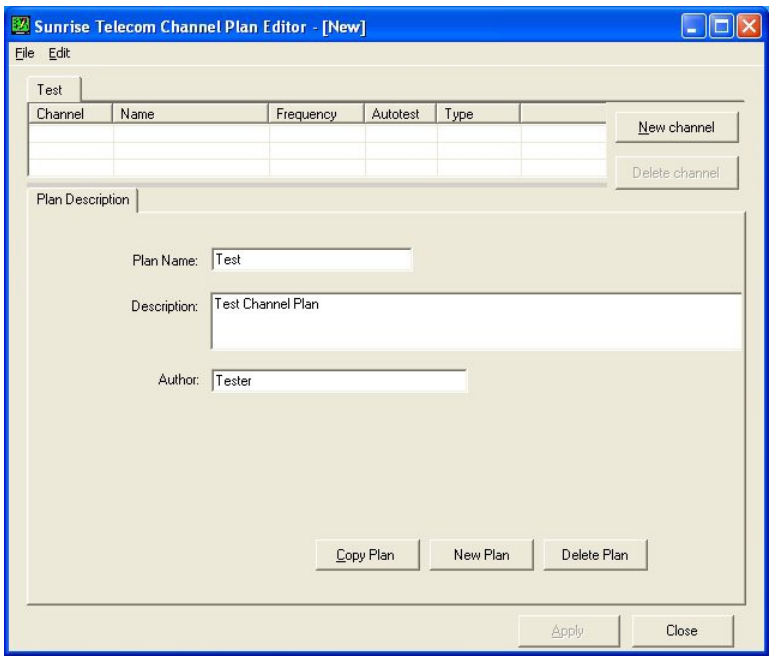


Figure 5-1: Creating a New Channel Plan

The top part of the Channel Plan Editor window shows the information for each channel in the plan. The bottom part provides fields to name your channel plan and add notes.

2. Enter the Plan Description information.
   - Select a name for your new channel plan. The name cannot have any spaces. If you want to separate words, use a character such as the underscore "_".
   - If desired, edit the description. Spaces are accepted in the description field.
   - If desired, enter your name in the Author field, without any spaces. If you want to enter your first and last name, separate each word with an underscore "_".
3. To save the basic setup for the channel plan file, go to the File menu and select Save As. Browse to the directory you want to use. By default, the Channel Plan directory is selected. Choose a name. ReVeal WinCOM adds the file extension .SCP.
4. To continue adding channel plans to this file, click New Plan and repeat step 2. The new plan's tab appears when you click New Plan or when you select another channel plan.

You are now ready to add channels to a channel plan. See section 5.2.1 for analog channels, section 5.2.2 for digital channels, or section 5.2.3 for other channels.

5.2 Defining Channels

5.2.1 Defining an Analog Channel

To define a channel, you must first open a channel plan file in the Channel Plan Editor. See section 5.1 to open the Channel Plan Editor.

1. Open a channel plan file.

   When you launch the Channel Plan Editor, ReVeal WinCOM opens the last channel plan file that was used. If this is not the channel plan file that you want to use, use the File menu to open another file with the extension .SCP. If this is the first time you are using the channel plan editor, a blank channel plan window appears.

2. Select the channel plan that will contain the new channel.

   A typical channel plan file contains several channel plans. The name of each plan in the file appears on a tab at the top of the window. If you are using a blank channel plan file, there are no tabs. Once you enter the channel plan file description (see section 5.1), you will see a tab at the top of the window. To add channels to one of the channel plans, first select the channel plan by clicking on a tab.

3. To add a channel to a channel plan, click New Channel. This opens the window used to define each channel. You need to use the tab menus to access all of the fields you need to complete for each channel. Go to the Channel Information tab and enter the information for the first channel in this channel plan.

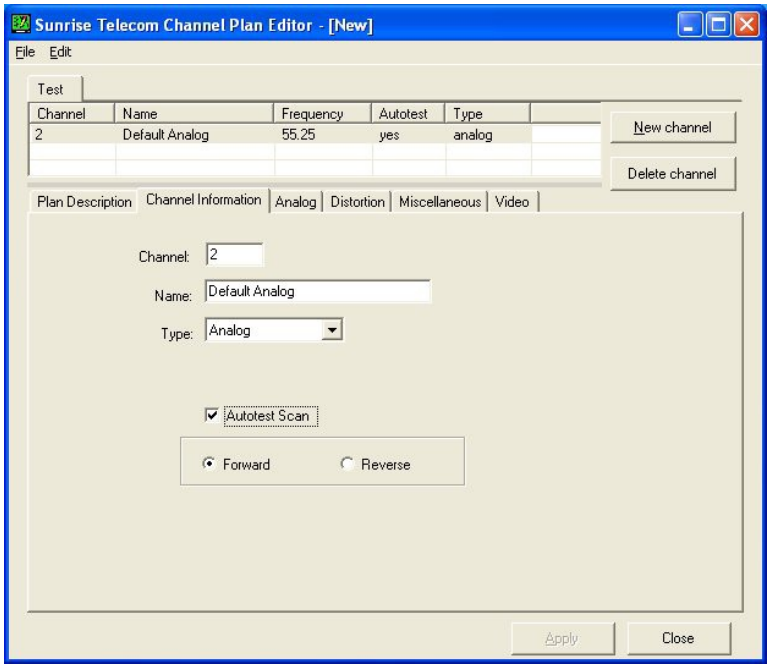


Figure 5-2: Setting up an Analog Channel

- Enter the channel number in the Channel field. You can use up to 4 alphanumeric characters.
- Enter a name, using up to 20 alphanumeric characters.
- Select the channel type: Analog, Digital, or Other. Once you select the type (analog, digital or other) the tab menus vary in order to present only the relevant fields you need. This section covers the instructions for analog channels.
- Select the Autotest Scan checkbox to include the channel in the automatic tests that the spectrum analyzer performs.
- Select Forward for downstream or forward path transmission channels, or select Reverse for upstream or return path signals.

4. Enter the analog channel's frequency information if you selected Analog in step 3. If you selected Digital, skip to section 5.2.2 on page 5-5. If you selected Other, skip to section 5.2.3 on page 5-6. Use these fields to define the channel's visual carrier frequency and scrambling, and the offset of the channel's aural carriers. You can also define FM and digital audio channels in this window.

Field	Data Range	Default Value
Frequency	5 to 1500 MHz	55.25
Modulation	NTSC-M, PAL-B, PAL-G/H, PAL-I, PAL-M, PAL-N, SECAM-B, SECAM-	NTSC-M

Field	Data Range	Default Value
	G/H, SECAM-K/L, Unknown	
Audio Freq	4 to 8 MHz	4.5
Audio 2 Type	None, FM, Digital	None
Audio 2 Freq*	4 to 8 MHz	0
Audio 2 BW*	0 to 2 MHz	0
Channel Width Low	-2 to -1 MHz	-1.25
High	4 to 6.75 MHz	4.75
Scrambling	None, Horizontal, Vertical	None

* These fields can only be edited if you selected FM or Digital in the Audio 2 Type field.

5. Enter the analog channel's distortion information. Use this window to define the composite triple beat (CTB), carrier to composite noise (CCN) and composite second order (CSO) distortion parameters.

Field	Data Range	Default value
Video Noise BW	4 to 6 MHz	4
CTB Gated Line	7 to 35	15
CTB Gated Field	Field 1, Field 2, Both	Field 1
CTB Freq. Offset	-9.99 to 9.99 MHz	0
CSO Gated Line	7 to 35	15
CSO Gate Field	Field 1, Field 2, Both	Field 1
Freq. Offset Low 1*	-9.99 to 0 MHz	-1.25
Freq. Offset High 1*	0 to 9.99 MHz	0.75
Freq. Offset High 2*	0 to 9.99 MHz	1.25
Freq. Offset Low 2*	-9.99 to 0 MHz	-0.75
CCN Gated Line	7 to 35	15
CCN Gated Field	Field 1, Field 2, Both	Field 1
CCN Freq. Offset Low	-9.99 to 9.99 MHz	2
High	-9.99 to 9.99 MHz	2

* Select the checkbox to tag the frequency.

6. Enter the analog channel's miscellaneous information. Use this window to define the channel's in-channel frequency response and depth of modulation parameters.

Field	Data Range	Default value
IRC Line	7 to 35	19
IRC Field	Field 1, Field 2	Field 1
IRC Signal Type	Multiburst, GCR, Cable Sweep	Multiburst
IRC Freq. 1	.5 to 5 MHz	0.5
IRC Freq. 2	.5 to 5 MHz	1.25
IRC Freq. 3	.5 to 5 MHz	2.0
IRC Freq. 4	.5 to 5 MHz	3.0
IRC Freq. 5	.5 to 5 MHz	3.6
Hum	Video, CW	Video
Hum Freq	50, 60 Hz	60
DOM Line	7 to 35	17

Field	Data Range	Default value
DOM Field	Field 1, Field 2	Field 1
DOM Signal Type	Multiburst, NTC-7, Composite TX	Multiburst

7. Enter the analog channel's video test information. Use this window to define the channel's luminance and chrominance parameters as well as signal to noise.

Field		Data Range	Default value
Video Diff Gain/Phase			
	Line	7 to 35	17
	Field	Field 1, Field 2	Field 1
	Signal Type	NTC-7, Composite TX, Full line 5 steps, Full line 10 steps, Full line ramp	NTC-7
Video YC			
	Line	7 to 35	17
	Field	Field 1, Field 2	Field 1
	Signal Type	NTC-7, Composite TX, Sine-squared pulse & bar	NTC-7
Video SN			
	Line	7 to 35	17
	Field	Field 1, Field 2	Field 1
	Signal Type	NTC-7, Composite TX, Sine-squared pulse & bar	NTC-7

8. Click Apply to record your changes and then continue adding more channels to this plan. Remember to save the channel plan file from time to time when you are editing the file.

5.2.2 Defining a Digital Channel

To define a digital channel, you must first open a channel plan file in the Channel Plan Editor (see section 5.1). Once you have opened the Channel Plan Editor, choose a channel plan file, and then select the channel plan within the file where you want to add the new digital channel. See steps 1 and 2 in section 5.2.1 to open a channel plan.

To add a digital channel to a channel plan:

1. Click New Channel or select New Channel from the Edit menu. Go to the Channel Information tab and enter the information for the first channel in this channel plan
   - Enter the channel number in the Channel field. You can use up to 4 alphanumeric characters.
   - Enter a name, using up to 20 alphanumeric characters.
   - Select the channel type: Analog, Digital, or Other. Once you select the type (analog, digital or other) the tab menus vary in order to present only the relevant fields you need. This section covers the instructions for digital channels.
   - Select the Autotest Scan checkbox to include the channel in the automatic tests that the spectrum analyzer performs.
   - Select Forward for downstream or forward path transmission channels, or select Reverse for upstream or return path signals.

2. Enter the digital channel's frequency and modulation information if you selected Digital in step 1. If you selected Analog, see section 5.2.1 on page 5-2. If you selected Other, skip to section 5.2.3. Use these fields to define the digital channel's polarity and bandwidth.

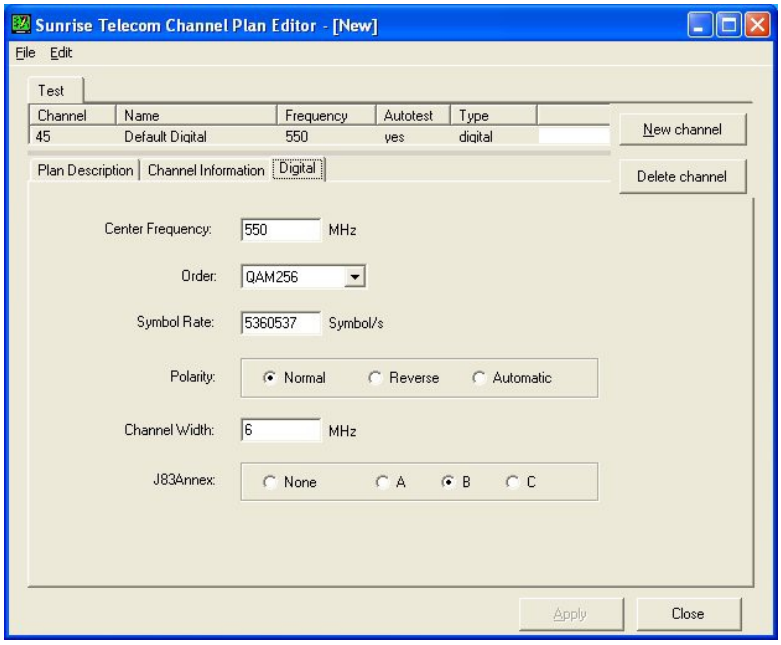


Figure 5-3: Setting up a Digital Channel

Field	Data Range	Default value
Center Frequency	5 to 1500 MHz	555
Order	QAM64, QAM256	QAM256
Symbol Rate	5 - 7 MS/s	5360537
Polarity	Normal, Reverse, Automatic	Normal
Channel width	1 to 10 MHz	6
J83 Annex	None, A, B, C	B

3. Click Apply to record your changes and then continue adding more channels to this plan. Remember to save the channel plan file from time to time when you are editing the file.

5.2.3 Defining Other Channels

"Other" channels can be leakage detection pilot carriers or other carriers such as QAM16 upstream signals used for monitoring. They are not standard analog or digital channels.

To add a special carrier to the channel plan, you must first open a channel plan file in the Channel Plan Editor (see section 5.1). Once you have opened the Channel Plan Editor, choose a channel plan file, and then select the channel plan within the file where you want to add the new channel. See steps 1 and 2 in section 5.2.1 to open a channel plan.

1. To add one channel, click New channel or select New channel from the Edit menu. Go to the Channel Information tab and enter the information for the first channel in this channel plan

- Enter the channel number in the Channel field. You can use up to 4 alphanumeric characters.
- Enter a name, using up to 20 alphanumeric characters.
- Select the channel type: Analog, Digital, or Other. Once you select the type (analog, digital or other) the tab menus vary in order to present only the relevant fields you need. This section covers the instructions for Other channels.
- Select the Autotest Scan checkbox to include the channel in the automatic tests that the spectrum analyzer performs.
- Select Forward for downstream or forward path transmission channels, or select Reverse for upstream or return path signals.

2. Enter the channel's center frequency and modulation if you selected Other in step 1. If you selected Analog, see section 5.2.1 on page 5-2. If you selected Digital, see section 5.2.2 on page 5-5. Use these fields to define the modulation and bandwidth.

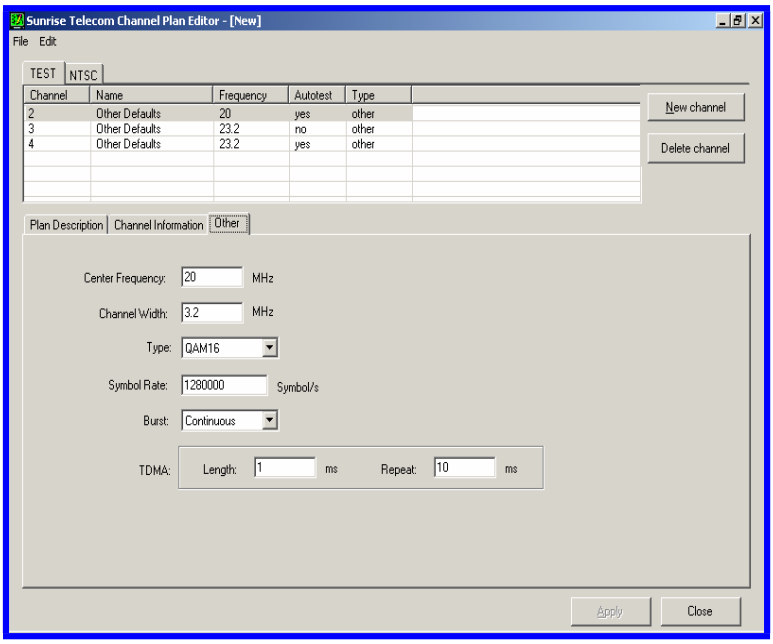


Figure 5-4: Setting up Other Channels

Field	Data Range	Default value
Center Frequency	5 to 1500 MHz	88.1
Channel Width	0.1 to 10 MHz	0.2
Type	QPSK, QAM16, QAM32, FSK, BPSK, CW, VSB-AM, FM, CDMA	FM
Symbol Rate*	0 to 99999999 S/s	0
Burst	Burst, Continuous	Continuous
TDMA Length	0 to 999999 ms	0
Repeat	0 to 999999 ms	0

* Not used for FM and CW carriers.

3. Click Apply to record your changes and then continue adding more channels to this plan. Remember to save the channel plan file from time to time when you are editing the file.

5.2.4 Defining Multiple Channels

ReVeal WinCOM's Create Multiple Channels command lets you add a group of similar channels to a channel plan all at once. Use this method to save time setting up a channel plan.

To define a multiple channels, you must first open a channel plan file in the Channel Plan Editor (see section 5.1). Once you have opened the Channel Plan Editor, choose a channel plan file, and then select the channel plan within the file where you want to add the new channels. See steps 1 and 2 in section 5.2.1 to open a channel plan.

To create multiple channels:

1. From the Channel Plan Editor, select Create Multiple Channels from the Edit menu. By default, ReVeal WinCOM opens a single channel range, starting at 55.25 MHz.

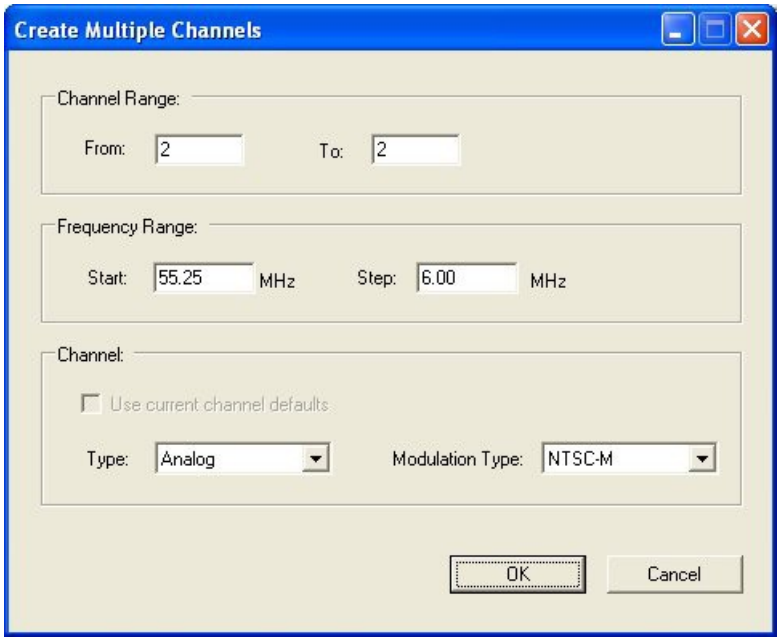


Figure 5-5: Creating Multiple Channels

2. In the Channel Range section, decide how many channels you want to add. Enter the starting and ending channel numbers in the From and To fields.
3. In the Frequency Range section, enter the starting frequency for the first channel and the number of megahertz between each channel. ReVeal WinCOM calculates the frequencies automatically for all of the channels in the range.
4. In the Channel section, define the basic parameters that are common to all of the channels you are adding:
   - Select the channel type from the available choices: Analog, Digital, or Other.
   - Select the modulation type from the available choices: NTSC-M, PAL-B, PAL-G/H, PAL-I, PAL-M, PAL-N, SECAM-B, SECAM-G/H, SECAM-K/L.

Note: In a new channel plan, all of the channels use WinCom II's default values for analog, digital or other channels. Refer to section 5.1 for details on the parameters for each channel type.

5. Click OK to create the new channels. You can now select each channel in the list at the top of the window, and edit any specific parameters. For editing analog channel parameters, see section 5.2.1 on page 5-2. For digital channels, see section 5.2.2 on page 5-5. For "other" channels, see section 5.2.3 on page 5-6.

6. To create another series of channels in the same channel plan, select Create Multiple Channels again from the Edit menu. You can now apply the channel parameters of the first series of channels you defined, in steps 4 and 5, to the new series of channels are creating. To do so, select the checkbox "Use values from channel x instead of defaults", where x is the highest channel you defined. To keep the defaults for the selected channel type, leave this checkbox unselected.

5.3 Copying a Channel Plan

ReVeal WinCOM's Copy Plan command creates a new channel plan using an existing plan. This is an easy way to copy channel settings that are common to multiple locations. You can then add or delete certain channels to customize your new plan.

ReVeal WinCOM comes with several sample channel plan files. You may want to choose a sample file that is closest to your current plan, and then use the Copy Plan method to save time setting up a channel plan.

To copy a plan:

1. First open a channel plan file in the Channel Plan Editor (see section 5.1).
2. Once you have opened the Channel Plan Editor, choose a channel plan file, and then select the channel plan within the file that you want to copy. Use the tabs at the top of the window to select a channel plan.
3. Click Copy Plan to create a new plan. The new plan's tab appears.
4. Edit the plan description:
   - You can change the name of the plan in the Plan Name field in the bottom part of the window. By default, ReVeal WinCOM adds the number "1" to the name of the new plan to indicate that it is a copy. Select a new name for your channel plan. The name cannot have any spaces. If you want to separate words, use a character such as the underscore or dash.
   - If desired, edit the description. Spaces are accepted in the description field.
   - If desired, enter your name in the Author field, without any spaces. If you want to enter your first and last name, separate each word with an underscore or dash.

You can now edit the channel plan or some of the channels in the plan. To add or delete channels, see section 5.4. For details on changing channel parameters, refer to section 5.2.1 for analog channels, section 5.2.2 for digital channels, or section 5.2.3 for other channels.

5.4 Editing a Channel Plan

If you have copied a channel plan to use as a starting point, you may want to make changes for a particular location. You can add or delete channels as required, or edit the settings for a particular channel.

Important: For AT2500 series used in conjunction with ReVeal WinCOM s/w version 2.2, alterations can be made to the channel plans while making measurements in the field. S/W version 2.2 provides the ability to import edited channel plans via the Channel Plan Editor, therefore eliminating the need to replicate them exactly on the PC.

Prior to WinComII s/w version 2.2, no alterations to the channel plans can be made while making measurements in the field. If any changes have been made in the field, the data will not be exported properly to FCC reports such as the VeEX report or Family Ware POP program. Make sure you replicate the changes exactly on the PC that will receive the field traces and produce the FCC report.

In either case, for purposes of data integrity, the channel plan should be finalized and used throughout the testing cycle.

To edit a plan:

1. First open a channel plan file in the Channel Plan Editor (see section 5.1).
2. Once you have opened the Channel Plan Editor, choose a channel plan file, and then select the channel plan within the file that you want to edit. Use the tabs at the top of the window to select a channel plan.
3. You can now make changes to the channel plan or to a specific channel.

Action	Commands and Reference to Instructions
Copying a plan	Click Copy Plan (see section 5.3 on page 5-9).
Creating a plan	Click New Plan (see section 5.1 on page 5-1).
Deleting a plan	Click Delete Plan to remove the selected plan from the file.
Creating a channel	Click New Channel to add a channel to the selected plan (see section 5.2 on page 5-2)
Deleting a channel	Click Delete Channel to remove the channel plan from the plan.
Editing a channel	Select a channel and use the tabs to access the channel parameter menus. The tabs vary according the channel type. See section 5.2.1 for analog channels, section 5.2.2 for digital channels, or section 5.2.3 for other channels,

5.5 Saving, Importing, & Exporting a Channel Plan

ReVeal WinCOM can import and export the channel plans you create or edit into a format that can be uploaded to a spectrum analyzer. Channel plan files which have the .SCP file extension are editable. Channel plan files with the .SCP file extension are exported to a file of type .ACP. Channel plan files with the .ACP extension are required in order to transfer the channel plan to a spectrum analyzer. The Channel Plan Editor utility within ReVeal WinCOM provides the ability to export and convert .SCP files to .ACP files.

5.5.1 Saving a Channel Plan File

To save a channel plan file in a format that can be edited by ReVeal WinCOM:

1. Choose Save or Save As from the Channel Plan Editor's File menu. Save overwrites the channel plan file with your changes, and keeps the same name. Save As opens a dialog box so you can choose another name and directory.
2. Browse to the directory you want to use. By default, the Channel Plan directory is selected.
3. Choose a name for your channel plan file. ReVeal WinCOM adds the file extension .SCP automatically.
4. Click OK to record your changes in the channel plan file.

Note When you exit a channel plan file or when you open a new file, ReVeal WinCOM prompts you to save your changes. This is a normal save operation and does not allow you to change the name or location of the file.

5.5.2 Importing a Channel Plan File

To import channel plan files from the AT2500 spectrum analyzer (files with .ACP extension) into the Channel Plan Editor format (files with .SCP extension):

1. Choose the Channel Plans entry in the Remote Files.
2. Select the specific file which contains the channel plan to be imported.
3. Move the file over to the local files into a desired directory where the channel plan is to reside.
4. Launch the Channel Plan Editor.
5. Choose Import from the Channel Plan Editor's File menu. This opens the Import dialog box.
6. Browse to the directory which contains the channel plan and open the file.
7. Proceed to make changes for each channel as required to the imported channel plan file.
8. Refer to Section 5.5.1 to save the file.

5.5.3 Exporting a Channel Plan File

Important: For AT2500 series used in conjunction with WinCom II s/w version 2.2, alterations can be made to the channel plans while making measurements in the field. Version 2.2 provides the ability to import edited channel plans via the Channel Plan Editor, therefore eliminating the need to replicate them exactly on the PC.

Prior to WinComII s/w version 2.2, no alterations to the channel plans can be made while making measurements in the field. If any changes are made in the field, the data will not be exported properly to FCC reports such as the VeEX report or Family Ware POP program. If changes were made in the field, replicate them exactly on the PC that will receive the field traces and produce the FCC report.

In either case, for purposes of data integrity, the channel plan should be finalized and used throughout the testing cycle.

To export a channel plan file in a format that can be transferred to an AT2500 series spectrum analyzer:

1. Choose Export from the Channel Plan Editor's File menu. This opens the Export dialog box.
2. Browse to the directory you want to use. By default, the Channel Plan directory is selected.
3. Choose a name for your channel plan file. ReVeal WinCOM adds the file extension .ACP automatically.
4. Click Save to export the channel plan file to a format for the AT2500 series spectrum analyzer.
5. Move the file over from the local files to the remote files.

Chapter 6 TROUBLESHOOTING AND MAINTENANCE

This chapter includes procedures for using ReVeal WinCOM on another computer, uninstalling ReVeal WinCOM, and for upgrading the spectrum analyzer. VeEX's technical support contact information is included at the end of this chapter.

6.1 Moving to a New Computer

ReVeal WinCOM only works on the computer that you used to install and register the software. If you need to install ReVeal WinCOM on a different computer, you need to obtain a new password for that computer.

When moving ReVeal WinCOM to another computer you must, as stated in the License Agreement, remove WinCom or ReVeal WinCOM from the old computer.

Follow the instructions for program removal in section 6.2, then install and register ReVeal WinCOM
on another computer. See Chapter 2 for installation and registration instructions.

6.2 Uninstalling ReVeal WinCOM

ReVeal WinCOM must be removed from your computer if you want to install it on a different computer, in accordance with the License Agreement.

ReVeal WinCOM is removed from your computer the same way that any other program is removed using the Windows operating system. Some steps in the program removal procedure may be slightly different depending on your operating system.

To remove ReVeal WinCOM:

1. Go to the Windows Control Panel. You can access the Control Panel through the Windows Start menu. For Windows 2000, select Settings then Control Panel.
   - In the Control Panel, select Add/Remove Programs.
   - Select ReVeal WinCOM from the displayed list and click Add/Remove or Remove, depending on your operating system. Follow the onscreen prompts.

Note: Data files are <u>never</u> deleted, only program files.

6.3 Upgrading Firmware

ReVeal WinCOM includes a simple utility for upgrading the spectrum analyzer's firmware with a special firmware file from VeEX:

AT2000 "L" type analyzers	file extension .ULF
AT2000 "D" type analyzers	file extension .UDF
AT2500 with parallel port	file extension .TAR.GZ
AT2500 with USB port	file extension .RUN

Note: All user parameters are set to their factory default values when you upgrade the firmware. Your channel plan is still in memory, but it may not be selected as the default plan. All stored measurements and settings are also kept in memory. As a precaution, download the stored data from the spectrum analyzer every time you upgrade or update

the firmware to avoid the possibility of losing data due to the incompatibility of a given parameter. See section 4.6, Exporting Data on page 4-19 for more information.

For firmware upgrades, the spectrum analyzer must be in remote mode. On the "R" series, from any mode except Menu, press the COMM function button to put the unit into remote mode. Or, select the Remote icon in the menu, and then select a mode such as Spectrum Analyzer. On "HM" models, the unit is normally set to operate in remote mode by default.

To upgrade the spectrum analyzer's firmware:

1. Make sure you have the appropriate firmware. VeEX provides update files on disk, or they can be downloaded from the website at www.VeEXtelecom.com. You must have a password in order to download files from the web site. Contact VeEX's customer support department to obtain a password.
   - Make sure the spectrum analyzer is in remote mode.
   - Run the WinCom II software and establish communication with the spectrum analyzer.
   - Select Upgrade Firmware from the ReVeal WinCOM Communications menu. Using the dialog box, select the firmware file. The firmware file has the extension ".TAR.GZ" for an AT2500 with a parallel port or ".RUN" for an AT2500 with USB ports.
   - Double-click on the file to start the upgrade procedure.
   - Once the file transfer is complete, ReVeal WinCOM will attempt to reconnect to the AT2500. It may take several minutes for the new firmware to load in the AT2500, in which case the reconnect attempt will time out.
   - Remember to set up your user parameters in the spectrum analyzer.

6.4 Troubleshooting Communication Errors

If you are having problems following a Windows session crash while you were connected to the analyzer, please note that it may take up to 3 minutes before Windows closes the socket and before the analyzer allows another log on attempt.

If you still cannot connect after 3 minutes, check the following.

1. Check for cabling errors. The spectrum analyzer needs to be connected to the PC or to the same network as the PC. Note that for direct connections, a crossover cable (Ethernet) or null modem cable (serial) is required. For connection information, see Chapter 2.

2. Check the firmware version of the spectrum analyzer. In order to operate with ReVeal WinCOM, you need firmware version 4.21 or higher for the AT2000, and you need firmware 1.00 or higher for the AT2500.
   - Check the analyzer's remote setup:
   - server mode active (system type is set to "Server")
   - system ID matches the ID in ReVeal WinCOM's connection
   - TCP/IP network is initialized
   - analyzer is in remote mode

   On the "R" series, from any mode except Menu, press the COMM function button to put the unit into remote mode. On "HM" models, the unit is normally set to operate in remote mode by default.
   - Check the port setup used for remote communication on the analyzer and on the PC. Make sure that you have configured the communications in ReVeal WinCOM to match the communication settings in the analyzer:
   - For serial communications, make sure the port speed matches.
   - For TCP/IP connections, make sure you have the correct subnet mask and gateway, if applicable. Check the IP address of the analyzer.

Technical Support

VeEX Inc. is committed to excellent service worldwide. Our goal is to provide you with professional assistance in the use of our software and services, wherever you are located. Technical Support and Customer Service solutions may vary by country. VeEX also provides product training to regional VeEX representatives so that they can offer some product support in your region in a prompt and personalized manner.

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Chapter 7 LEGAL NOTICES

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Chapter 8 INDEX

10Base-T 2-2
Abbreviations iii
analyzer modes 3-12
trace types 3-12
Add channel plan 5-1
Analog channels 5-2, 5-3
Analyzer connections 2-4
Analyzer modes 3-12
ASCII iii
AT2000 connections 2-2, 2-3
Autocalibration iv
Autotest ..... iv, 5-6
BAS record iii
Baud rate ..... iv, 2-8
Cables
Ethernet 2-4
included 1-1
null modem 2-4
required cables 2-1
CCN 5-4
Channel plan iv
add analog channels 5-2
add digital channels 5-5
add other channels 5-7
AT2000 files 3-2
AT2500 files 3-2
copy 5-9
create new 5-1
default 5-1
edit 5-11
export 4-20, 5-12, 5-13
file definition iv
import 5-12
save 5-12, 5-13
Channel setup
analog 5-3
digital 5-5
other 5-7
Channel width 5-6, 5-8
Colors
AT2000 files 3-2
AT2500 files 3-2
TraceView 4-7
COM port 2-7
Comments 3-11
Communication
log on 2-9
settings 2-7
troubleshooting 6-2
Company (record) 3-11
Connection
create new 2-7
edit 2-8
Ethernet 2-4
methods 2-1, 2-2
network 2-4
serial 2-4
Copy
channel plan 5-9
record from AT2000 3-7
record from AT2500 3-3
record to AT2000 3-7
record to AT2500 3-4
Copyright 2
Crossover cable (Ethernet) 2-4
CSO 5-4
CTB 5-4
Current channel plan 4-20
Custom colors 4-7
Customer service 6-3
Date format 2-10, 4-9
Default channel plan 5-1
Definitions iv
Device 2-7
DHCP iii
Digital channels 5-5
Direct Ethernet connection 2-2
Direct serial connection 2-2
Display ..... See also Monitor
color 4-8, 4-12
units 4-8
DIST record iii
DM record iii
DNS iii
DOM Signal Type 5-5
Domain iv
DPWR record iii
Duplicate channel plan 5-1
Edit
channel plan 5-1, 5-11
Records database 3-9
system information 4-22, 4-24
WinCom database 3-9
E-mail 6-3
Ethernet
cable 2-4
connection 2-4
Excel macros 4-23
Export
ASCII format 4-19
channel plan 4-20, 5-12, 5-13
clipboard (BMP) 4-21

FamilyWare 4-23, 4-24
QAM records 4-16
VeEX POP 4-21
traces 4-19
FamilyWare 4-24
FCC ..... iii, 3-1
Features 1-1
File names 3-2
File transfer 3-3, 3-7
Files 3-1
AT2000 files 3-2
AT2500 files 3-2
folders (AT2500) 3-3
Firmware 6-1
Folders (AT2500 records) 3-3
FR record iii
Frequency response (QAM) 4-14
Gain/Phase 5-5
Gateway iv
Glossary iv
Graphic format (BMP) 4-21
Group delay (QAM) 4-14
Help menu 1-2
Horizontal markers 4-4
Hub iv
Hum ..... iii, 5-5
Importing a Channel Plan 5-12
Installation
cables 2-1
requirements 2-1
setup.exe 2-5
IRC Signal Type 5-4
J83 Annex 5-6
LAN connection 2-2
Leakage detection 5-7
Local ID 2-8
Logging on 2-9
Maintenance 6-1
Markers 4-4, 4-5, 4-8, 4-12
Memory
minimum) 2-1
volatile 3-9
Minimum requirements 2-1
Modem 2-7
Modulation (analog channel) 5-3
Monitor requirements 2-1
MPEG iii
Multiple channels 5-8
New connection 2-7
Null modem cable 2-4
Open a record 3-7
Other channels 5-7
Package contents 1-1
Parameter files 3-2
Password 2-6
PC requirements 2-1
Pilot carriers 5-7
Plan description 5-2
Platform 2-1
Polarity 5-6
POP iii
Port
COM port 2-7
TCP-IP port 2-8
PPM iii
Preview 4-17
Printing
print setup 4-17
screen 4-18
tagged records 4-18
Processor (minimum) 2-1
Proof of performance
FamilyWare 4-24
print records 4-21, 4-23
VeEX macros 4-20
system information 4-22, 4-24
Properties (record) 3-11
QAM
export 4-16
frequency response 4-14
group delay 4-14
Order 5-6
record iii
statistical data 4-13
view records 4-12
zoom 4-12
Recalling records 3-1
Receive record from AT2500 3-3
Record
AT2500 files 3-3
file extensions 3-2
print 4-18
properties 3-11
Records database
content 3-2
definition iv
directory 3-5
maximum 3-2
open 3-5, 3-9
Reference level ..... iv, 4-3
Registration 2-6
Remote device 2-7
Remote files 3-4
Remote ID 2-8
Remote mode ..... iv, 6-2
Remove program 6-1
Reports
FamilyWare format 4-23, 4-24
proof of performance 4-21, 4-23
report header 4-22, 4-24
VeEX macros 4-20
Requirements 2-1
Retry count 2-8
Retry delay 2-8

Router iv
SA record..... iii
Sales support..... 1-1
Scroll markers..... 4-5
Serial connection 2-4
Server mode..... 2-9, 6-2
Settings
AT2000 files 3-2
AT2500 files 3-2
spectrum analyzer 4-2
Setup
COM port..... 2-7
communications 2-7
printer 4-17
spectrum analyzer 2-9
WinCom setup 2-7
Signal Type..... 5-5
Site ID 3-11
SLM record..... iii, 3-12
Speed iv
SRTB iii
Statistical data..... 4-13
Store records..... 3-1
Subnet.....iv
Symbol rate..... 5-6, 5-8
System ID 2-2, 2-6, 2-9, 6-2
System information 4-22, 4-24
System type 2-2
Tag..... iv, 4-18
TCP-IP..... iii, 2-8
TDM record..... iii
TDMA Length..... 5-8
Technical support 1-1, 6-3
Telephone 6-3
Temperature units..... 4-8
Terms.....iv
Test point iv
Toolbar
markers 4-4
QAM mode 4-16
TraceView 4-9
Trace
AT2000 files 3-2
AT2500 files 3-2
color 4-8, 4-12
maximum in a file 3-2
preview 4-17
print..... 4-18
recall 4-1
types..... 3-12
TraceView 4-1
Trademark 2
Trial version 2-6
Troubleshooting..... 6-1, 6-2
Uninstall 6-1
Units
temperature 4-8
vertical scale 4-8
Upgrade firmware..... 6-1
User ID 2-6, 3-11
Version
firmware 6-2
trial..... 2-6
uninstall previous..... 2-5
Vertical markers 4-4
Vertical scale 4-3
Video Diff Gain/Phase 5-5
Video Noise BW 5-4
Video SN 5-5
Video YC..... 5-5
View
AT2000 traces..... 4-1
AT2500 traces..... 4-1
constellation zoom 4-12
multiple trace display..... 4-2
print preview..... 4-17
QAM records 4-12
record properties 3-11
traces..... 4-1
Website..... 6-3
WinCom database
create..... 3-8
definition.....iv
edit or append 3-9
open 3-6
print..... 4-18
save 3-9
Windows
communication error..... 2-9, 6-2
requirements 2-1
Windows XP..... 2-5, 4-25, 5-1, 5-11, 5-13