

Galactic Industries Corp.

Software Products for Analytical Spectroscopy



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Galactic Industries History

1985: Galactic is founded on the concept that software designed for inexpensive PCs could provide analytical scientists with the speed, flexibility and data processing power of traditional instrument workstations. The concept is to free the instrument to do what it is there for: collecting data.



Galactic Industries Product Milestones

- *1986: DOS-based Spectral Display & Processing Software - Spectra Calc*
- *1987: Spectral Library Search & first Instrument Control versions of Spectra Calc*
- *1989: Enhancements for Chromatography & Hyphenated techniques - Lab Calc*
- *1992: Windows-based software - GRAMS/386*
- *1994: Real time 3D visualization - GRAMS/3D*
- *1996: Spectral Notebase - GRAMS/32*
- *1997: Full 32-bit software with Network Administration - GRAMS/32 Version 5*



Analytical Laboratories Today...

- *Too many different instruments and software packages*
- *Still have instrument “down time” while data is processed on workstation*
- *No common data file formats or central storage of raw data*
- *LIMS good for storing results; limited for raw data*



Corporate Software Standardization

- *Unified desktop interface for all raw instrument data*
- *Common data file format*
- *Provide basic functionality for analytical techniques*
- *Network installation, administration & user access control*
- *Database interfaces for archive & retrieval of raw data*

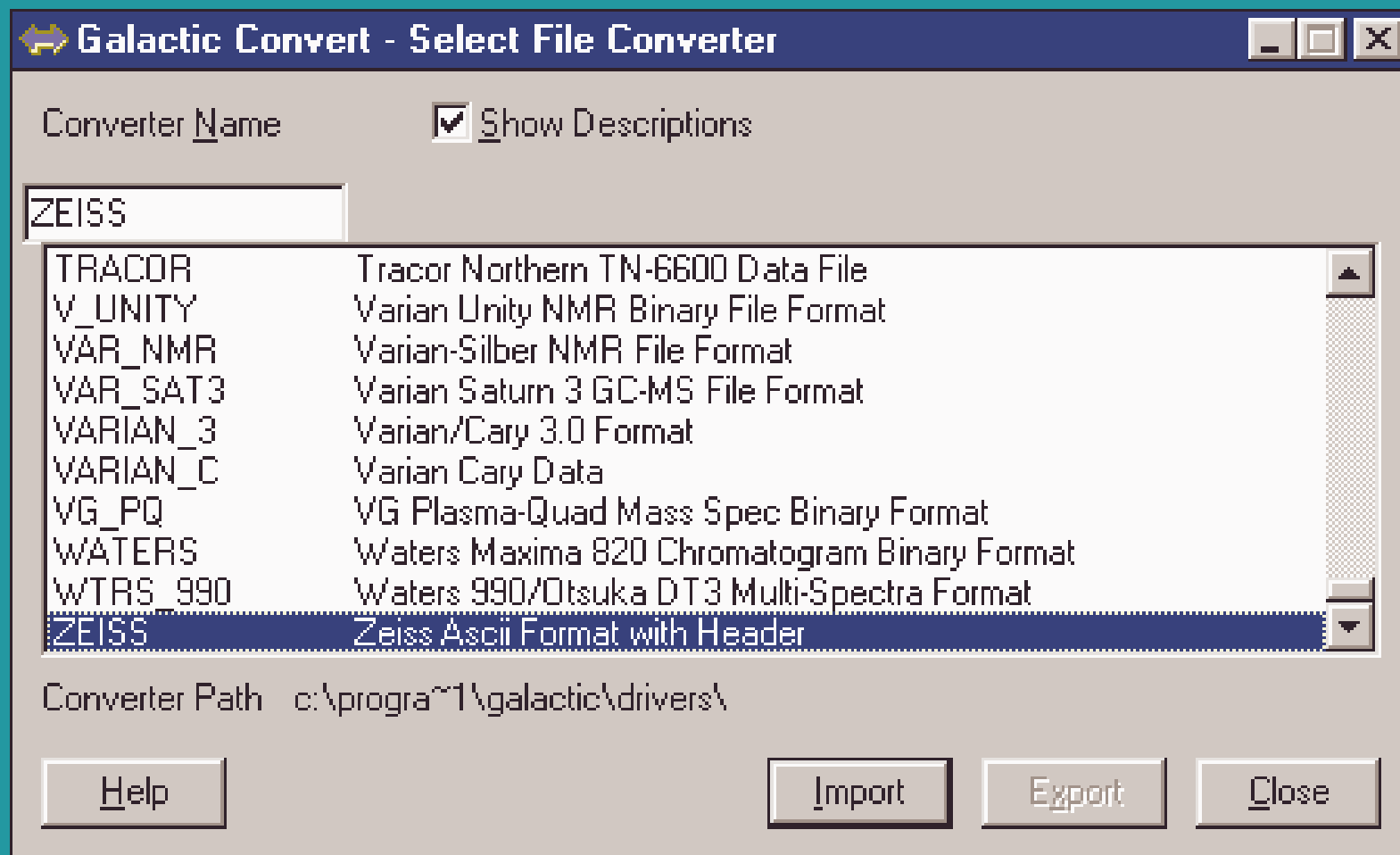


GRAMS/32[®] with Spectral Notebase

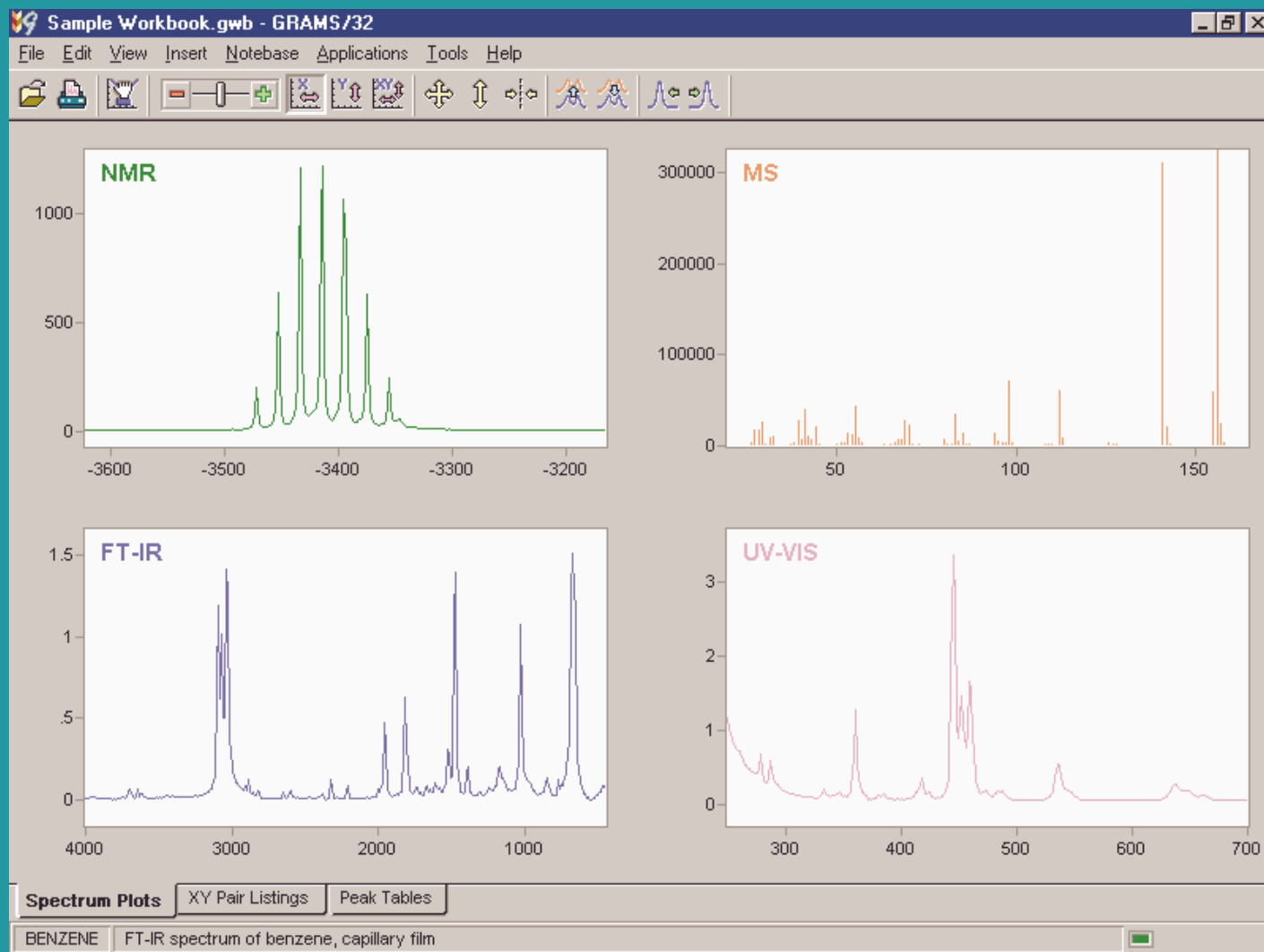
- *Import or collect data from hundreds of instruments into common file format*
- *Fast, powerful data visualization and presentation quality graphics*
- *Comprehensive data processing library for multiple instrument techniques*
- *Data security and user administration*
- *Advanced database data management*



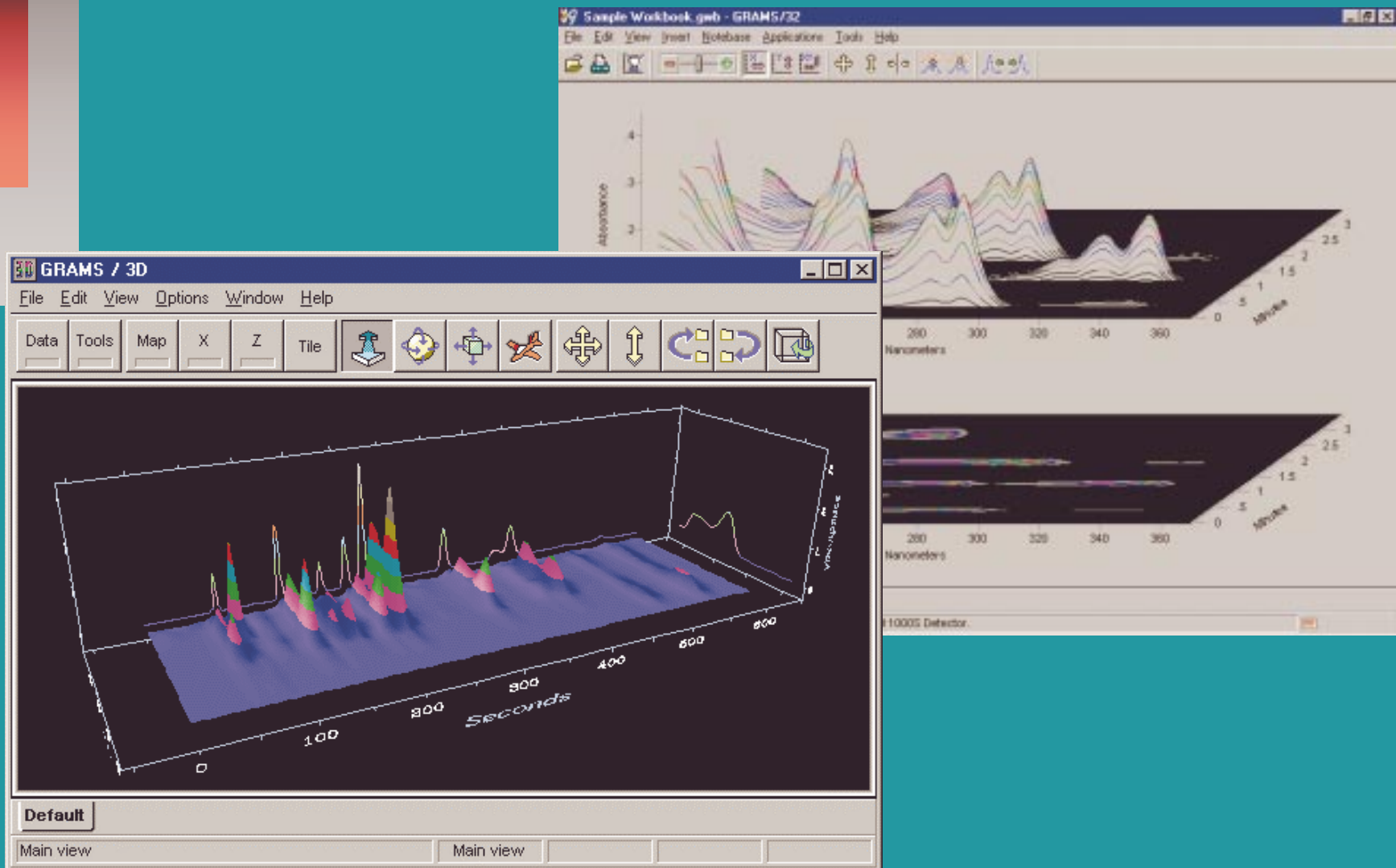
GRAMS/32: Data File Import



GRAMS/32: *Spectra from Different Techniques*



GRAMS/32 & GRAMS/3D: Multi-dimensional Data Visualization



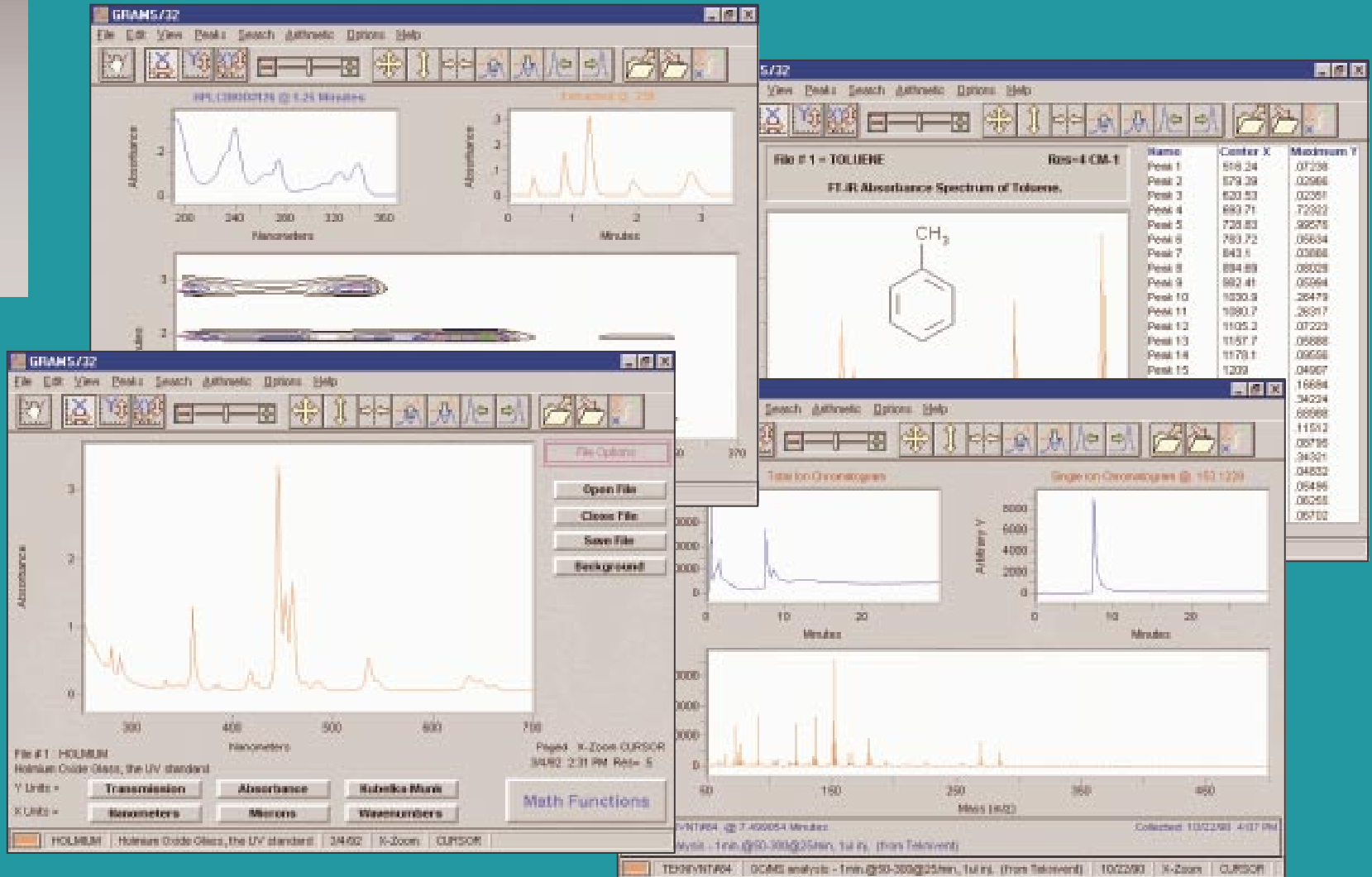
GRAMS/32:

Data Visualization & Graphics

- *Real time zoom and scroll*
- *Multiple data windows: single, overlay, stack*
- *2D and 3D data displays*
- *Add annotations, peak marks, tables, graphics, and more*
- *Paste other OLE objects like chemical structures, equations, etc.*



GRAMS/32: Create Custom "View Pages"



GRAMS/32:

Comprehensive Data Processing

- *General data processing routines*
- *Instrument technique-specific applications*
- *Chemometrics and specialized data processing*
- *Utilities & Macro Wizard*
- *Powerful Array Basic™ language*



GRAMS/32: General Data Processing

The screenshot displays the GRAMS/32 software interface with three main windows:

- Top Window (Result):** Shows a chromatogram plot with a y-axis ranging from -0.2 to 0.6 and an x-axis from 450 to 650. The plot shows a noisy baseline with a prominent peak around 500.
- Right Window (Derivative Functions):** A dialog box with tabs for Point Diff, Sav-Golay, and Gap. The Sav-Golay tab is active, showing a Convolution Function with Derivative set to 1st, Degree set to 2, and Points set to 5. Buttons for Apply, Autoscale, Auto Y, OK, Cancel, and Help are present.
- Bottom Window (Result):** Shows a chromatogram plot with a y-axis from 0 to 2.4 and an x-axis from 260 to 320. The plot shows a noisy baseline with a prominent peak around 275. Below the plot is a zoomed-in view of the baseline with several square markers indicating points.
- Bottom Window (Baseline Options):** A dialog box with tabs for Points, Funct, Poly, and Auto. The Points tab is active, showing Fixed Points options: 2-Point (unselected) and Multi-Point (selected). Force Points onto Data options: Yes (selected) and No (unselected). Leveling Mode is set to Level Only. Buttons for Autoscale, Auto Y, Apply, Undo, OK, Cancel, and Help are present.

At the bottom of the interface, there is a legend and instructions:

- BASELINE** (with a blue square icon): Right click in BOTTOM trace box to add points. Left click to move points. Left double click to delete a point.
- DERIVATIVE** (with a blue square icon): Sample File = HOLMIUM
- BASELINE** (with a blue square icon): Sample File = CARY2

Additional text at the bottom right of the interface reads: "BOTTOM trace box to Zoom. Click in TOP trace box to estimate number of points."

GRAMS/32: IR Spectral Library Searching

Spectral ID
File Edit View Search Tools Help

Spectrum Search
Peak Search
Text Search
Cascade Search
New Search
Options...

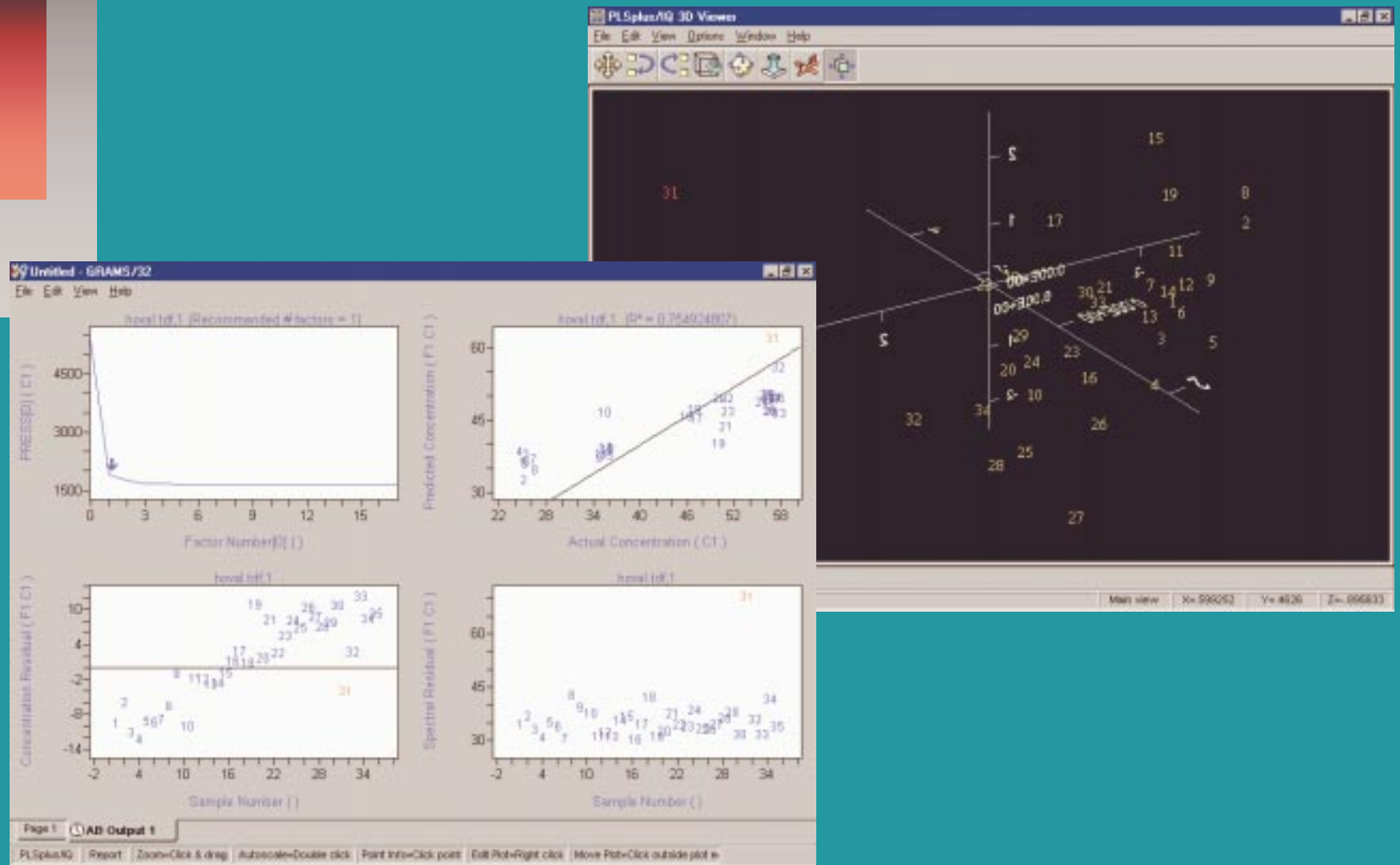
1051.55

3500 3000 2500 2000 1500 1051.55

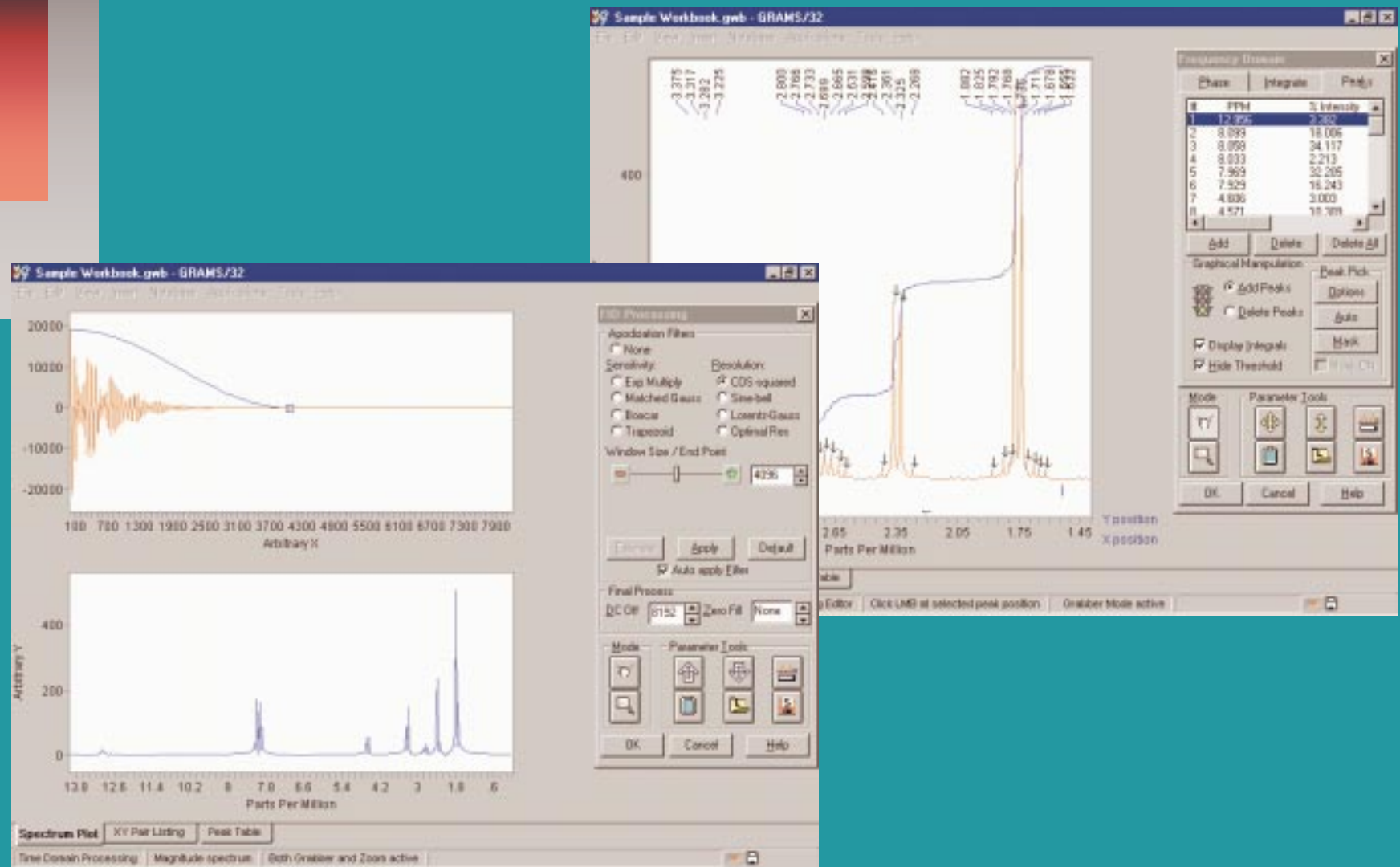
BENZENE, 99+%, A.C.S.
SPECTROPHOTOMETRIC
GRADE
Aldrich Catalog #: 15462-8
Aldrich Vapor FT-IR vol. 3, 849A
Aldrich FT-IR vol. 1, 931A
Sigma-Aldrich Safety Library vol. 1, 349A
FP=+12
RI=+1.5010
RTECS#=CY1400000
Density=0.874
MF=C6H6
CAS=71-43-2
MP=+5.5
BP=+80.2
MW=78.11
Copyright Aldrich Chemical Co., Inc.

Hit	Quality	Memo	Library(Index)
1	0.2729293	Benzene, 99+% CAS#=71-43-2	E:\LIBS\ALDCON1.lib(#428)
2	0.2838724	Benzene	E:\LIBS\EPAVAP.lib(#557)
3	0.2922743	BENZENE, 99+%, A.C.S. SPECTROPHOTOMETR	E:\LIBS\ALDRICH.lib(#2501)
4	0.3774729	BENZENE	E:\LIBS\SADTLER\TU.lib(#6)
5	0.5030103	"Benzene, cyclopropyl-"	E:\LIBS\EPAVAP.lib(#3238)
6	0.5247026	CYCLOPROPYLBENZENE, 97%	E:\LIBS\ALDRICH.lib(#2519)
7	0.5344661	"Benzene, (1-chloroethyl)-"	E:\LIBS\EPAVAP.lib(#146)
8	0.5371754	Benzyl mercaptan	E:\LIBS\EPAVAP.lib(#1873)
9	0.5579877	BENZYL MERCAPTAN, 99%	E:\LIBS\ALDRICH.lib(#3353)
10	0.5597314	"Sulfide, benzyl phenyl"	E:\LIBS\EPAVAP.lib(#2319)
11	0.5793452	BROMODIPHENYLMETHANE, 97%	E:\LIBS\ALDRICH.lib(#2889)

GRAMS/32: PLS Calibration Development



GRAMS/32: "1-D" NMR Data Processing



GRAMS/32:

Data Security and Administration

- *Automated data processing audit trail*
- *User passwords and access privileges*
- *Electronic signatures*
- *Galactic “Certified” data processing applications*
- *Encrypt custom algorithms and processing routines*



GRAMS/32:

Spectral Notebase™ Database

- *Archive, organize, search and retrieve instrument data*
- *Built-in MS Access database engine*
- *ODBC connectivity for commercial relational databases*
- *Easy-to-use Wizards for creating databases and queries*




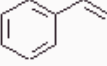
















GRAMS/32: Spectral Notebase Browsing

Sample Workbook.gwb - GRAMS/32

File Edit View Insert Notebase Applications Tools Help

File # 1 = C:\GRAMS5\DATA\SAMPLE1.ODB 1.30E+01 Rows

Source	Spectrum	Text File	Document File	Image Document
PROJ1-445		NMR; CDCL3, 5TH SET GE/Nicolet Charm Created: 3/4/92 4:46 PM	Document	
PROJ1-446		RES 4 POLYSTYRENE Created: 2/4/93 10:07 AM PROJ1-446		
PROJ1-349		barbiturates sample Created: 9/18/89 5:37 PM PROJ1-349	$\sum_0 \sqrt{A \times B^2}$	
PROJ1-347		Gasoline sample at 30 Hz Created: 7/28/89 2:20 PM PROJ1-347	Worksheet	
PROJ1-397		Polystyrene spectrum from NIRSystems instrument Created: 8/1/89 2:39 PM	Slide	
PROJ1-397		Princeton Instruments ST-1000 Diode Array PROJ1-397	Wave Sound	
PROJ1-364		8450', DF=2, Giesenschlag drilled cuttings Created: 6/12/91 3:36 PM		
PROJ1-363		Raman Spectrum from SPEX SpectraMax Software Created: 8/1/94 4:16 PM	Document	
PROJ1-361		Varian Cary3 - Coated mirror Created: 9/12/91 5:00 PM	Bitmap Image	

Query_1 Sample1 Spectrum Plot XY Pair Listing Peak Table

[POLYSTY] Polystyrene spectrum from NIRSystems instrument

GRAMS/32: Spectral Notebase Editing

The screenshot displays the GRAMS/32 software interface. The main window shows a table with columns for 'File #', 'Source', and spectral data. A document editor window is open over the table, displaying a document titled 'Coupling Quantitative and Qualitative Chemom...'. The document text reads: 'Quantitative chemometric methods such as PL determining the compositional makeup of mate materials based solely on subjective requireme chemometrics it is important to recognize which Quantitative and Qualitative chemometrics are techniques to improve the ability to detect outli best model. In this paper we will give a number' followed by a list of references: '1. W. Lindberg, J. Persson and S. Wold, Anal. 2. D. Haaland and F.V. Thomas, Anal. Chem.' The table below the document editor shows spectral data for 'PROJ1-397' with columns for 'Created: 7/28/89', 'Polystyrene spectrum from NIRSystems', and 'Princeton Instruments ST-1000 Diode'. A chemical drawing window titled 'ISIS/Draw - [C:...' is open in the foreground, showing a chemical structure of styrene (vinylbenzene) with a benzene ring and a vinyl group. The drawing window has a menu bar with 'File', 'Edit', 'Options', 'Object', 'Style', 'Templates', and 'Chem', and a toolbar with various drawing tools. The status bar at the bottom of the main window shows '[GESPC1] CDCL3, 5TH SET GE/Nicolet Charm 3/4/92 X-Zoom CURSOR'.

File #	Source	Spectral Data
PROJ1		
PROJ1		
PROJ1		
PROJ1		
PROJ1		
PROJ1-397	Created: 7/28/89 Polystyrene spectrum from NIRSystems	
PROJ1-397	Princeton Instruments ST-1000 Diode	

GRAMS/32 Software

- *Provides a common environment for gathering, viewing, and processing data from many different sources*
- *Spectral Notebase organizes and archives all laboratory data in industry standard databases*