

# The Service Detail

## RBD is now providing sales and service for the Millbrook MiniSIMS<sub>2</sub>

The Millbrook MiniSIMS is a high-throughput SIMS instrument designed for both speed and ease of use. SIMS systems used to require a large investment in both time and training, but with the MiniSIMS this analytical technique is now available to everyone. The versatile and affordable MiniSIMS will be at home in a corporate R & D lab, government facility, or a university research lab. Basic training for the instrument takes a few hours - far less than the amount required for a conventional SIMS installation!

This desktop SIMS instrument complements **Auger, XPS and SEM (EDX)** systems by providing:

- True surface analysis
- Detection of all elements
- Identification of organic species
- High sensitivity
- Fast chemical imaging
- Thin film profiling



**Millbrook MiniSIMS**

The MiniSIMS can acquire data in three different modes: static SIMS, imaging SIMS and dynamic SIMS. Analyzing this data is straightforward with the easy to use software and optional peak identification and spectral library modules. On many samples, all three types of acquisitions can be performed in as little as 20 minutes! This makes the Millbrook MiniSIMS ideal for production support applications.

*Continued on page 2*

***In This Issue:***

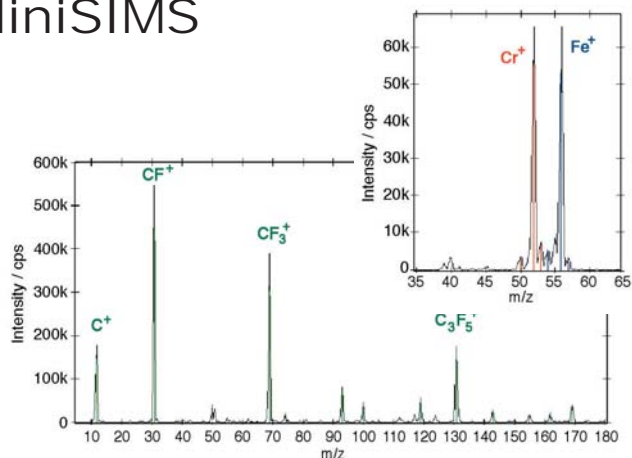
New Products - Millbrook MiniSIMS .....	1	Software Corner - Composites in AugerMap .....	6
New Products - System Upgrades .....	3	Software Updates - AugerMap 2.1.1 and AugerScan 3.1.1 ..	7
Services - Technical Support .....	4	Featured Items - VG Mark II Components .....	8
Surface Analysis Standards on CD-ROM .....	4	New Products - AVC Modification Available .....	9
Services - Expanded Lab Capabilities .....	5	Special Offer - Pfeiffer Turbopump and Controller .....	9
Tech Tip - Imaging with a 600 or 660 .....	5	Software Corner - Latest CasaXPS Features .....	10
Tech Tip - Using an Ion Gun to Troubleshoot .....	5	Refurbished Systems .....	11
Tech Tip - Termination Ceramics .....	5	New Products - 20-115 Replacement .....	11

# New Products

## Millbrook MiniSIMS

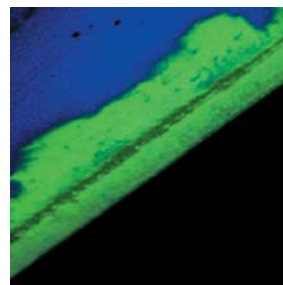
### Static SIMS (surface analysis)

In this example, surface spectra from two different points on a steel razor blade look very different. The peak identification software and data library were used to identify the major surface components. The spectrum on the left, from an area near the edge of the blade, is dominated by fluorocarbons. The spectrum on the right shows an area consisting of Cr/Fe, typical of steel.



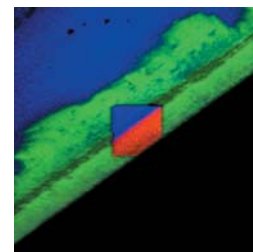
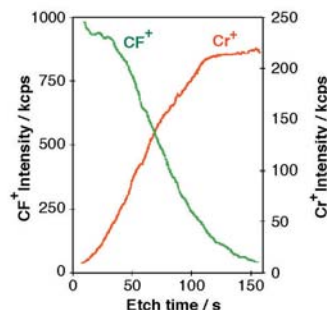
### Imaging SIMS (spatial analysis)

The ion beam is rastered over the surface while data is acquired. We now see where the steel ( $\text{Fe}^+$  in blue) is overlaid with fluorocarbons ( $\text{CF}^+$  in green). This overlayer is very thin and would be difficult to detect using a technique with lower surface specificity such as EDX



### Dynamic SIMS (depth analysis)

Sputtering the blade near the edge reveals the  $\text{Cr}^+$  (red) below the  $\text{CF}^+$  layer. Re-imaging the blade shows that the  $\text{Cr}^+$  is a narrow band along the edge of the blade.



### Other applications include:

*Surface Coatings & Treatments • Electronic Components • Semiconductors*

*Electrodes & Sensors • Lubricants • Catalysts • Adhesives*

*Thin Films • Packaging Materials • Corrosion Studies*

Additionally, several application notes are available from our website:

[Detecting Surface Contamination](#), [Monitoring Monolayer Coatings](#), [Monitoring Nanoscale Coatings](#)

For more information on the **MiniSIMS**, please contact RBD at [sales](#) or call 541.330.0723 x303.

# System Upgrades

## New Upgrades Available for PHI Systems

With the addition of the PHI 6600 SIMS system and 5700 XPS systems, RBD can now upgrade **most PHI systems and components**. Our upgrade hardware and software provide a very user friendly interface in a Windows (98, 2000, or XP) environment. Now is a great time to replace your aging NT workstation with a computer running Windows XP.

In this issue we will highlight three particular systems, the 6300/6600 SIMS, the 5000LS (large sample) XPS and the 660 Scanning Auger Microprobe. *For more information on any of our **upgrades** please contact RBD at [sales](mailto:sales) or call 541.330.0723 x303.*

### 6300 and 6600 SIMS Upgrade

Our 6300/6600 SIMS system upgrade uses CasaXPS software to provide many more analysis options than were included in the original PHI software. As with all of our upgrades, this one operates on recent Windows operating systems. (We recommend XP Professional.) If you have the original Perkin-Elmer or Apollo computer on your 6300 or 6600 SIMS system, contact us to find out how we can improve your productivity and extend your system's useful lifetime by at least ten years.



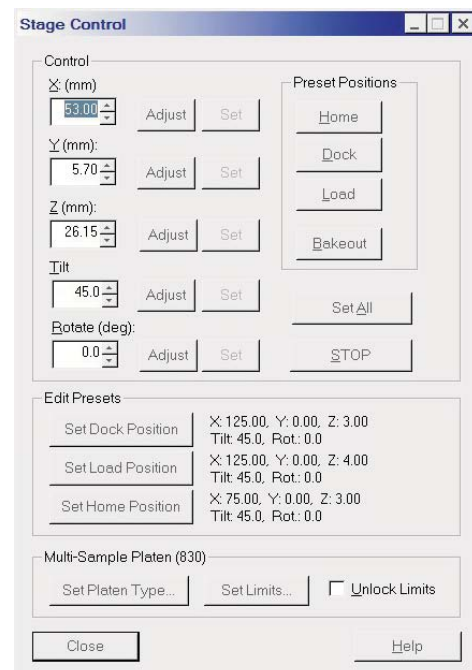
**6600 SIMS upgrade at Microfabritech,  
University of Florida**

### 5000LS Upgrade

Although PHI no longer provides service contracts on the 5000LS series of instruments, RBD continues to offer service for all aspects of the LS. Our XPS Scan PC upgrade for this instrument includes all of the stage controls and acquisition types that you would expect, as well as upcoming automation enhancements to increase sample throughput. In addition, CasaXPS can provide data analysis features that exceed PHI's Multipak software in terms of ease of use, number of features and the ability to create publication quality graphics.

*Continued on page 4*

### LS Stage Control in AugerScan 3



# System Upgrades

## 660 Scanning Auger Upgrade

With the recent release of [AugerMap 2](#), our [Auger PC upgrade](#) has more features and is easier than ever to use! In addition to improving the reliability of the system by eliminating many unnecessary card rack boards, our upgrade also runs on Windows XP. Another advantage of the upgrade is having the TV image displayed directly on the PC monitor. Lastly, two PC monitors can be used simultaneously using our dual monitor option.

[CasaXPS](#) has recently added [LLS for Auger](#), and our 660 upgrade can take advantage of this feature. If you often depth profile samples, you should consider CASA just for that one feature. Many of the data reduction functions used commonly for XPS can also be used for AES, which can enhance the value of your data.

# Services

## Technical Support Improves Capability

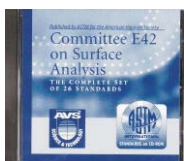
To help improve our technical support, we have implemented an expert system that will enable our technicians to respond more quickly to basic system and component questions and problems. But in order for this to be effective, we need your help! If you have a question or problem, we ask that all customers contact Tech Support via email or phone.

If you request technical support using a different RBD email address or phone extension, your request will be forwarded to Tech Support and processed as soon as possible. By routing all technical problems through our technical support desk we will be able to continually add problem and resolution information to the expert system, which will in turn help us to provide even better service in the future.

*For technical questions and problems related to your surface analysis system or component, please contact [tech@rbdenter.com](mailto:tech@rbdenter.com) or call 541.330.0723 x311 and we will respond as soon as possible.*

# Standards from AVS

## ASTM Surface Analysis Standards from AVS



Twenty-six [ASTM Standard Guides and Practices about Surface Analysis](#) can now be purchased on a CD-ROM from AVS for only \$50.00 plus postage and handling. Beginning in 1976, these standards have required thousands of hours of work by hundreds of volunteers and have been done very thoughtfully and carefully by leading scientists, engineers, and technologists, most of whom have been or are now members of the ASSD of the AVS. The standards are reviewed every five years and those on this CD are current as of November, 2003.

# Services

## Expanded Surface Analysis Lab Capabilities

With the recent addition of a [PHI 5600LS](#) instrument to RBD's [Surface Analysis Lab](#), our XPS lab services now include the use of a monochromatic Al x-ray source and the large sample stage available only with the LS series of instruments. Other features include a small-spot of 75  $\mu\text{m}$  and a Balzers thermal leak valve (which greatly improves ion gun stability during depth profiles).

For samples requiring an even smaller area to be analyzed, the lab's [PHI 660 Scanning Auger Microprobe](#) is available.

For more information on how our lab can alleviate overflow, analyze samples requiring immediate attention, or provide a technique your lab doesn't have, please contact the lab's scientist, [Carl Steinke](#), at 541.330.0723 x314. Should you choose to [travel to the lab](#), it is available for a very reasonable daily rate.



# Tech Tips

## Three New Tech Tips Now Available



### ***Imaging with your 600 or 660***

This procedure completely covers the operation of the electron gun, beam column and analyzer optics so that you can get the best performance possible out of your system. A must read for any Auger operator!



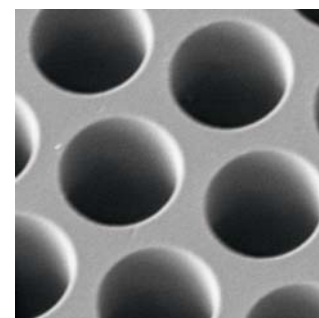
### ***Using ion induced low energy electrons***

This procedure addresses both diagnosing analyzer problems using the low energy electrons produced by an ion gun beam as well as using those electrons to align the ion gun itself.



### ***CMA termination ceramics***

This TechTip explains how to determine if your cylindrical mirror analyzer (CMA) has a termination ceramic contact problem.



**SED image taken with  
a PHI 660**

## Using Composites in AugerMap 2

Welcome to another addition of Software Corner. For this issue, we're going to focus all of our attention on one of the exciting new features of *AugerMap 2* – composite images.

With a composite image, colorization is used to visualize the intensity and location of various elements. The composite can be exported as a 24-bit full-color bitmap, so it is suitable for use in both electronic and print forms.

When RBD first started upgrading Auger systems (way, way back in the early 90's!), composites were a difficult proposition on the average PC of that era. Besides memory allocation and file size issues, many systems still ran on PC's which supported a maximum of 256 colors. That meant that adding color to a gray-scale image would degrade the quality of the underlying image.

Now that we have powerful PCs that can edit digital movies, decode the human genome, and download bad music from the 70's, we can finally create full-color composite Auger images. We'll provide a simple

example here; you can impress your friends and colleagues with your own colorful images.

There are two ways to create a composite image – by using the *Composite* command in the *Image* menu, or by dragging-and-dropping. Drag-and-drop is quick and easy, so we'll use that method in our example.

Typically, you will start with a gray-scale topographic image, such as the SED image shown below (of a surface mount capacitor). Before creating a composite, you'll need to colorize the elements you are interested in, by selecting each one and choosing *Color Assignments* from the *Image* menu. In Figure A, we've assigned yellow to tin, and red to carbon.

If you are viewing all three images (the SED, tin, and carbon regions) simultaneously, you can create a composite by simply dragging the tin image on top of the SED. This will create a new window for your composite. After dragging the carbon on top of this window, the result will be a composite of all three images. (See Figure B)

*Continued on page 7*

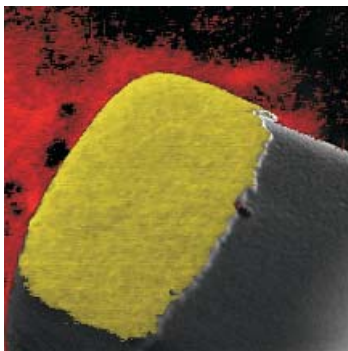


**Figure A. (From L to R) SED image, tin assigned to yellow, carbon assigned to red**

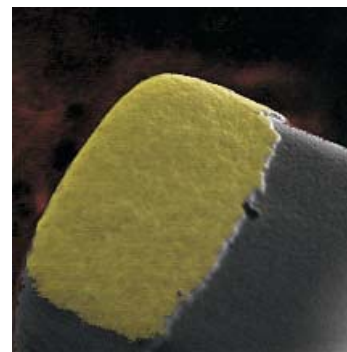
## Software Corner

By default, the layers of the composite are opaque, such that the elements obscure the topography of the gray-scale image underneath. You can change this by selecting *Edit Composite* from the *Image* menu. By checking the *Transparent* option, the element colors will be blended with the topography of the background, as seen in Figure C.

Using the *Edit Composite* dialog, you can add and remove regions. Also, if you have re-acquired or changed the colors of a region, you can update the region (note that composite regions are not automatically updated if you change the original image).



**Figure B. Opaque Composite Image**



**Figure C. Transparent Composite Image**

You can also annotate composites and assign micron markers to them. Like other *AugerMap 2* images, they can be copied to the clipboard (with or without annotations) or printed directly. *AugerMap 2* also provides plenty of different options for coloring your image regions, including multiple-range color mapping and color blending.

If you already have *AugerMap 2*, then check out the online help for more detailed information on colorization and composites. If you haven't yet upgraded but are considering it, then [download the demo](#) for a look at all that's new. We're constantly improving our software products and adding new features, so be sure to check back often.

## Software Updates

### AugerMap 2.1.1 and AugerScan 3.1.1 Released

Updaters for AugerMap 2 and AugerScan 3 are [now available](#). *AugerMap 2.1.1* includes improved support for 660 systems as well as improvements to the scanning dialog box. *AugerScan 3.1.1* includes improved SIMS controls, supports for the 32-096 X-ray Source Control, and more efficient control of MCD detectors on XPS systems.

*Please note that if you have a 72-205-5 or 72-205-7 motor control on your XPS instrument the DR11 cable has been moved on the RBD 147 interface from port B to port C as of AugerScan 3.1.1. All known customers with this motor control board will receive instructions and another DR11 cable from RBD.*

The “-5” motor control is generally found on the LS XPS systems (e.g. 5000LS, 5600LS). The “-7” is found on the 5500, 5600 and 5700.

## Featured Items



Refurbished 11-067 and 04-300 Ion Gun Package with 1 year warranty.

\$10,950.00

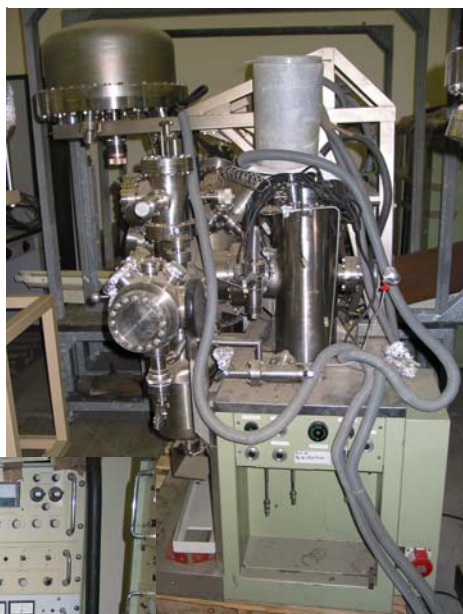
Refurbished 11-065 and 04-303 Ion Gun Package with 1 year warranty.

\$14,950.00

Refurbished PHI 1248 X-ray Source Subsystem. Includes 04-500 source, associated electronics, HV supply, and water chiller with 1 year warranty.

\$14,950.00

The following units from a VG Mark II system are available. They are guaranteed to work upon receipt, but are not refurbished and do not come with a warranty.



Contact [sales](#) for more information.

Ion Gun Controller (IGC 27)	\$2,450.00
Specimen Temperature Controller	\$800.00
Pump Control Unit	\$1,500.00
TSP power Supply	\$1,200.00
Gun Supply Unit	\$3,000.00
Digital Electromagnetic Scan Unit	\$3,800.00
Physical Imaging Unit	\$1,900.00
QMS Control	\$2,000.00
Flood Gun Supply Unit	\$1,800.00
SMIS RGA Unit 370	\$2,500.00
Monochromator	\$8,500.00
Standard X-ray source	\$3,000.00
Specimen Stage	\$2,500.00
Bell Jar	\$2,500.00
SCA 5 channel detector	\$6,000.00
Ion gun	\$3,850.00
Clam Analyzer	\$4,500.00



# New Products

## AVC Modification Now Available



The thermocouple gauge control (hockey puck) used in the PHI Auto Valve Control (AVC) is no longer manufactured. RBD Enterprises has been able to repair the hockey pucks when they fail, but sometimes the board in the hockey puck is burned beyond repair. Our solution to a non-repairable hockey puck is an affordable replacement thermocouple gauge control unit that also provides a digital readout of the vacuum.

Our digital panel meter control provides a reading from 5000 mTorr to 1 mTorr. This increases the

accuracy of the vacuum reading as compared to the simple bar graph display on the AVC remote box.

RBD can provide the gauge for self-installation at \$400.00 (instructions included) or we can install the gauge and also perform a preventive maintenance on your AVC unit for only \$995.00 (including all parts except solenoids). The next time your AVC fails, be sure to send it to RBD for repair and installation of this upgrade.

Contact [sales](#) for more information.

# Special Offer

## Pfeiffer Turbopump Special

For a limited time, RBD is offering a special price on the Pfeiffer TMU 071 turbo pump and DCU 100 control. Normally priced at \$6,000.00 for the turbo pump, control and cables, the special offer price is only \$5,100.00

If you are experiencing problems with your TPU040, 050, 060 or 063 turbo pump on your PHI surface analysis system, it is time to consider replacing your pump and control.

For more information contact [sales](#).



**Pfeiffer TMU 071**

# Software Corner

## CasaXPS - Much more than just XPS data processing!

As many of you know, CasaXPS is a powerful post-acquisition package for XPS data. Many scientists have chosen Casa software as an addition to our XPS PC upgrade. CasaXPS is a robust package for XPS analysis that offers a variety of highly customizable quantification options, including Principal Components Analysis (PCA).

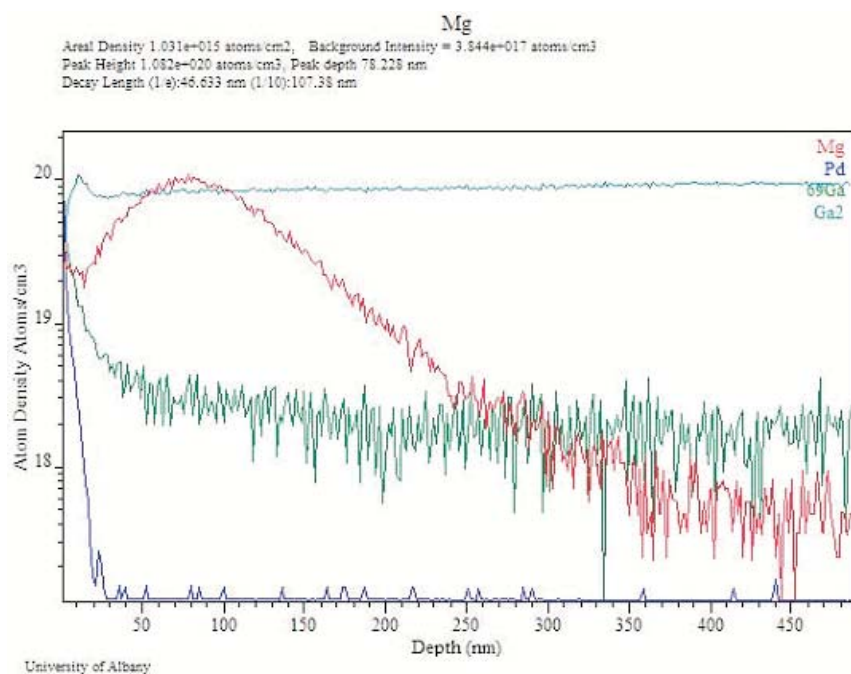
Now, CasaXPS can further streamline your data analysis with its added features for both Auger and SIMS data analysis, regardless of instrument manufacturer. In the area of AES analysis, one new feature is sure to be of interest – Linear Least Squares fitting of Auger depth profiles. You can often use this protocol to differentiate between different chemical states in a depth profile and get results that you could only previously achieve with your XPS instrument.

In the area of SIMS, CasaXPS has incorporated new features specifically for our SIMS PC upgrade for the

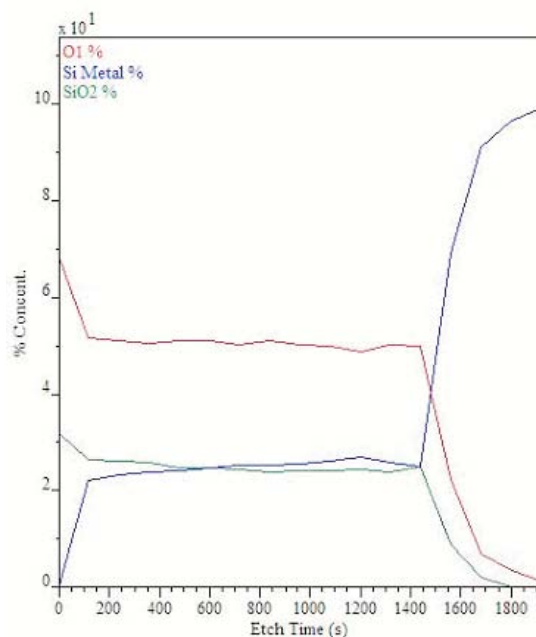
PHI 6300 and 6600 systems. CasaXPS now contains not only an exact mass calculator, but also all of the standard dynamic SIMS quantification protocols. You can even assign different relative sensitivity factors to the various films on your sample to yield very accurate results.

CasaXPS is the perfect program for laboratories that have surface analysis systems from various manufacturers in their labs. CasaXPS supports the data formats used by PHI, VG, Kratos and Specs systems. Why have multiple data reduction software packages when you can use the one that also happens to be the easiest to use, the most powerful and the best value?

Please contact **RBD** for more information regarding **CasaXPS**.



Calibrated Mg SIMS depth profile



Auger depth profile analyzed using LLS

# Refurbished Systems

RBD currently has webpages for [refurbished optics](#), [refurbished electronics](#), [refurbished systems](#), and [miscellaneous equipment](#). These are updated weekly, so be sure to check back often, or give us a call if you are interested in something that is not currently listed.

The following refurbished systems available:

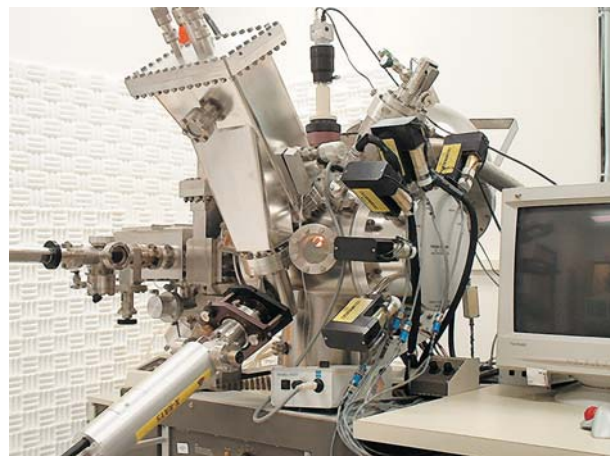
PHI 5600LS ci XPS (large sample), \$218,000

PHI 570 XPS and AES with large double-pass  
CMA, \$85,000

PHI 600 Scanning Auger, \$105,000

PHI 660 Scanning Auger System, \$135,000

PHI 6300 Quadrupole SIMS, \$125,000



**PHI 5600LS ci**

All systems include installation, training, and a one year warranty. *Please contact [sales](#) if you would like more detailed information on any of these systems, or a quote outlining your exact requirements.*

# New Products

## 20-115 Ion Gun Controller Replacement

The [RBD 20-172 Ion Gun Control](#) can be configured to operate a PHI 04-191 or 04-192 ion gun at no additional charge. This control works exactly the same as the 20-115, with the exception of beam voltage. The maximum beam voltage for the 20-172 is 3kV vs. 5kV for the 20-115. However, since most applications require lower beam voltages to prevent mixing, the 20-172 is perfect. If your 20-115 is getting old and troublesome, it may be time to replace it with a brand new unit. Or better yet, send in your 04-191 or 04-192 ion gun to RBD for a complete rebuild and testing with a new 20-172 control.



**RBD 20-172 Ion Gun Controller  
(ion gun optional)**

*For more information please contact [sales](#).*