



# THE SERVICE DETAIL

Surface Analysis Systems Newsletter

April 2002

*In This Issue:*

**RBD Now Directly Offers Surface Analysis Services ..... 1**

**Interactive Web-Based Training and Support is Received Well by Customers. .... 1**

**PCMAPII Board is the centerpiece of new image registration feature for the PHI 590, 595 and 600 Systems. .... 2**

**Software Corner – AugerScan™ 3.0 and AugerMap™ 2.0..... 4**

**Magnetic Load Lock Upgrade..... 7**

**Refurbished Systems and Components..... 7**

**Obsolete DACs for PHI Systems now being remanufactured by RBD Enterprises... 8**

**Tech Tip: Source For High Vacuum Bellows..... 8**

**NEW! RBD Model EGC 200 5kV Electron Gun Control..... 9**

**NEW! RBD Model MAC 200 Multiplier / Analyzer Control ..... 9**

**Tech Tip: 20-622 Steering Voltage Adjustment Procedure. .... 10**

**RBD 04-303 and 06-350 Ionizer Rebuilds –Seeing is believing ..... 12**

**Tech Tip: 04-303 Ion Gun Shorting-Out Problem..... 12**

**RBD Enterprises Contact Information..... 13**

## **RBD Now Directly Offers Surface Analysis Services**

We are very pleased to announce that RBD now directly offers analytical services using Scanning Auger and bulk SIMS analysis. As our Analysis Lab grows, we will add other techniques including XPS, SEM and EDS. Just as with our repair services, we will fill a niche for value priced surface analysis service. For more information please visit our web site under [Services – Analytical Services](#), or, email us at [lab@rbdenter.com](mailto:lab@rbdenter.com)

## **Interactive Web-Based Training and Support is Received Well by Customers.**

Our WebEx™ Internet conferencing support center has received rave reviews from all customers who have used this invaluable service. Whether used for training, troubleshooting, or software demonstrations, our interactive support saves time and results in better communication.

When used for troubleshooting, problems that may have taken days to solve by sending faxes back and forth can now be solved in just a few minutes in many cases. To use this service, your analytical system’s computer needs to be connected to the Internet.

This service is included as part of any PC upgrade package that RBD offers, which means that in most cases you can install the upgrade yourself and still receive the same quality of training as when one of our engineers is on site. In short, our interactive Web-based support is one of the most exciting aspects of using the Internet for increasing productivity while at the same time reducing costs.

And, if your company decides to sign up for WebEx as a tool for your own business, RBD offers a referral discount program. Contact us for more information on how this service can help you save time, money, and frustration.

### **PCMAPII Board is the centerpiece of new image registration feature for the PHI 590, 595 and 600 Systems.**

Several of our latest upgrade products are combined to create a whole new level of system performance and capability for the generation of Scanning Auger systems that originally were controlled by the DEC PDP11 computer and MACS software. Those systems include the 590, 595, 600 and 610. Most likely your system has already been upgraded with our Scanning Upgrade package that includes the Model 110 Interface Unit, a PHI PC137A interface card and the RBD PCMAP1 card. During the mid 1990s and even as recently as a year ago, that upgrade was state of the art and worked with the latest technology in PCs. However, the PC137A and PCMAP1 card are ISA standard, and ISA is no longer widely produced.

The new standard for PCs and system control is now PCI. Anticipating that this was the direction that the PC market was heading, RBD began design several years ago on a PCI standard interface unit for PHI systems. The result was the RBD 147 System Interface unit, in production for over 3 years.

Now, we have incorporated the PCMAPII card to fit inside of the 147 system Interface so that we only require one PCI slot in your PC in order to be able to control most PHI systems and also provide control of the electron beam.

By combining the RBD 147 Interface Unit, the PCMAPII scan card, and AugerMap 2.0 and AugerScan 3.0 software, your system can have new features and capabilities including:

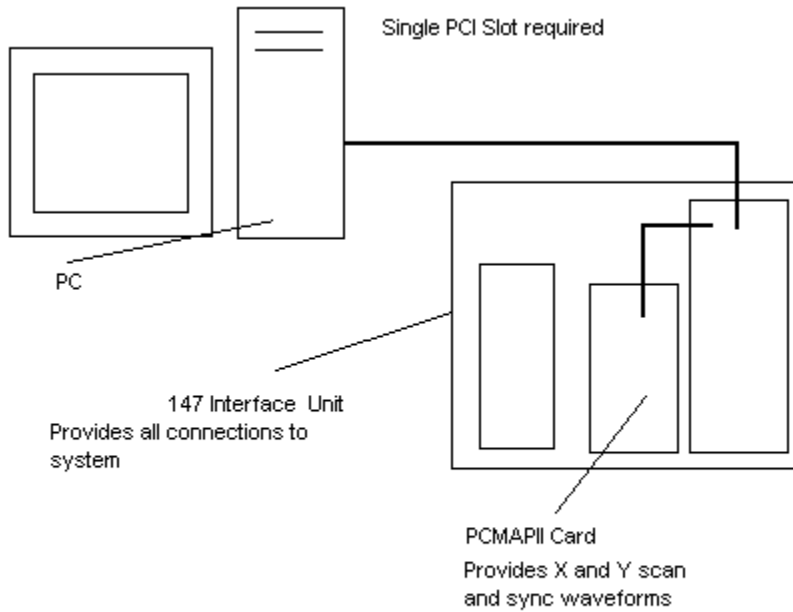
- **Image Registration** – Ability to keep the beam on small particles indefinitely.
- **Improved performance** – Better imaging, stability and lower noise levels.
- **Real time PC imaging Option** – This option eliminates the Electrohome TV and provides a digital image directly on your PC desktop. [Click here](#) to see what it looks like. (You will need to scroll down to the PCMAPII section).
- **XP, NT and Windows 2000 compliant** – If you buy a new PC, the operating system will be one of these and not Window 95 or 98.
- **Advanced image filtering and massage features**

What exactly do you need to upgrade your system? If you do not already have the RBD 147 PC Interface Unit, you need:

1. **RBD 147 PC Interface Unit**
2. **PCMAPII Mapping Card**
3. **AugerMap 2.0 software upgrade**
4. **AugerScan 3.0 software upgrade**

[Datasheet](#)

[Datasheet](#)



**Optional:** Direct Imaging Option. This allows you to image directly into your PC monitor and eliminates the Electrohome TV monitor.

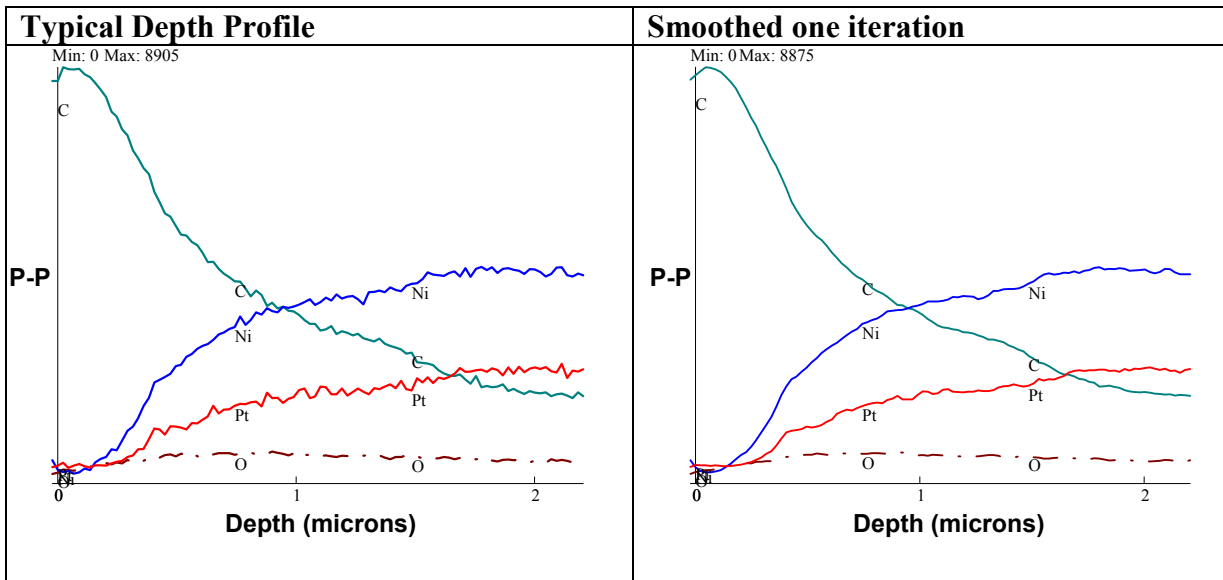
Contact us for a WebEx™ demonstration of how these new features and capabilities will improve the productivity of your scanning auger system.

## Software Corner – AugerScan™ 3.0 and AugerMap™ 2.0

Spring is finally here and so are the new releases of our AugerScan and AugerMap programs. Both programs have significant changes, improvements and new features.

### *Some of the new AugerScan 3.0 Features*

- **Profile Smooth Command.** This feature averages out the normal background fluctuations during depth profiles and results in better-looking depth profiles.

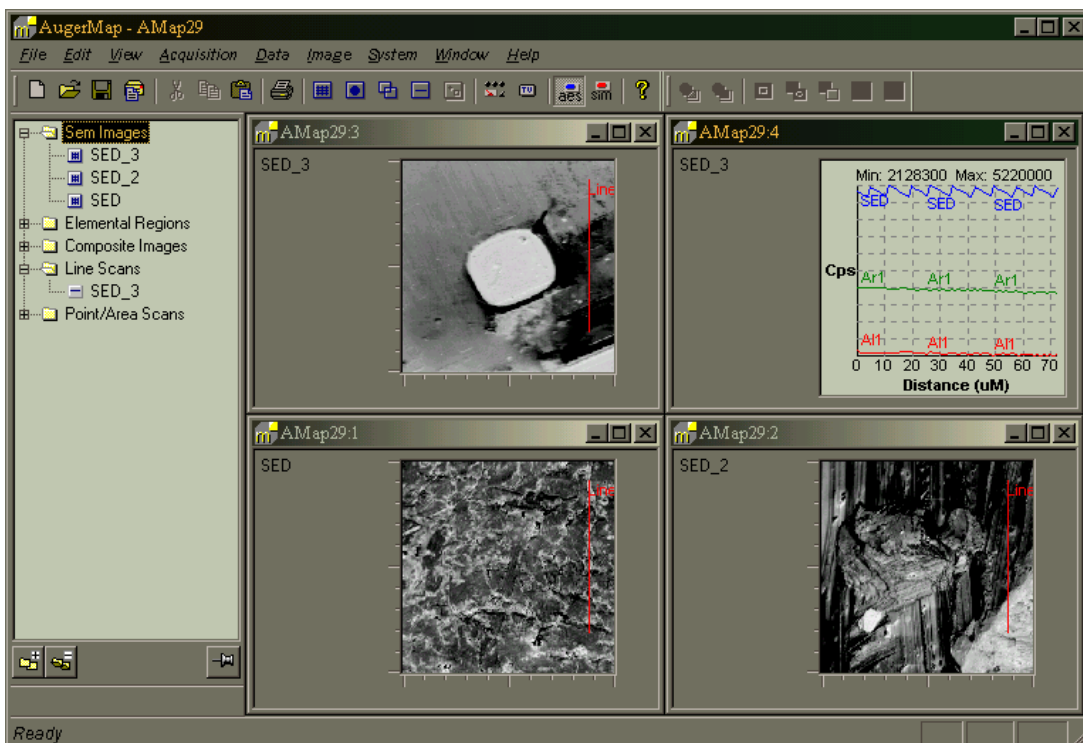


- **Enhanced Graphing Options** for XPS data results in improved curve fitting and complete reporting for multiplexes (including height, area, and FWHM).
- **Multiplex from a survey or depth profile cycle.** This feature allows you to perform quantitative analysis (including curve fitting) on the data without exporting it to another program.
- The ability to **export multiple files** as ASCII saves you an enormous amount of time if you do data analysis outside of AugerScan. Instead of opening each file and exporting, you can now simply select multiple files and export with one click. Hundreds of files can be exported in seconds!
- **Send E-mail Command.** In one click, AugerScan calls up your e-mail client, creates an e-mail, and attaches the selected acquisition. This makes it very simple to send data to your customer or colleague.

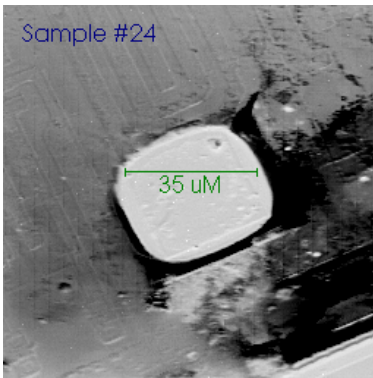
- **Markers can be saved and loaded from lists.** Marking your data has never been easier. You can now track elements while marking and select with a single keystroke. Markers can also be selected/deselected from an atomic concentration. Best of all, markers can be saved and loaded from lists, which is an enormous timesaver.
- **Three-Point Depth Profiles** allow you to acquire profile data much faster during acquisition, providing higher depth resolution at fast sputter rates.
- **Numerous new features** help make acquisition easier, including end-of-acquisition alarms, and options to prompt for saving after acquisition.
- **New file formats are supported** for better interoperability with third-party applications including PHI-Multi-pak, CASA XPS and XPS Data.

### *Some of the new AugerMap 2.0 Features*

- **Enhanced image processing and filtering** features allow you to perform sophisticated image manipulation including brightness, contrast, inversion, smoothing, sharpening, and edge detection without the need for third-party applications.
- **New user-interface** makes image and acquisition management easier than ever. A **Project Window** allows easy access to all acquisitions: SEM images, elemental images, line-scans, **color maps**, composite images and AES surveys, multiplexes, and depth-profiles. A multiple window interface makes it easy to compare acquisitions from the same map file or multiple files.



- **An Improved Scanning Control** interface makes electron gun control easier than ever. New features include the real-time control of emission voltage (solving a Windows™ problem), keyboard shortcuts for all functions, and slider controls for fine control of all settings.
- **Full featured annotations and micron markers** can be copied to image bitmaps, which makes it easier to produce publication-quality presentations.



- Line Scans have been improved and are now **completely customizable**, with options for choosing line styles, widths, colors, grid, etc.
- **Automatic Image Registration** allows you to collect data at high magnification while AugerMap keeps the image positioned properly. This is a huge improvement for PHI™ 590, 595, 600, and 610 scanning auger systems, which never had this capability before. You will be able to use your system to solve problems that until now, only 660, 670, and 680 systems were capable of.
- **Images can be colored** and overlaid to create composites. This feature can also help to find artifacts that are not normally visible.

**Special Offer** -For a limited time, beta versions of both our new AugerScan and AugerMap programs are available at a special pre-release price. This will help us to get valuable cross-system functionality testing, as well as your feedback to ensure that the final product is exactly what you need. Once the beta period is over, both programs will only be available at the full upgrade price. We will continue to support the current versions via our Technical Support service, but to get the new features you will need to purchase the upgrade.

**If you want the upgrade of either or both programs as soon as possible, please contact us for more information. We will notify all customers when the final versions are released and we begin supporting the current versions only through our Technical Support service.**

## Magnetic Load Lock Upgrade

We are now recycling the 04-725 sample intro arms and converting them into magnetic load locks for \$2,350 (exchange). That is about 1/3 of what other magnetic load lock upgrades cost.

### The advantages of this upgrade are:

- Better vacuum during sample loading
- System won't dump if the probe gets bumped
- No more Teflon seals and spacers to replace
- No expensive intro switch assembly that breaks every few years

**BEFORE**



**AFTER**



By recycling the 04-725 load lock assemblies, the cost of upgrading to a magnetic load lock is greatly reduced. Simply replace your existing 04-725 with our upgrade and then return your old 04-725-load lock to us.

To order this upgrade, please use RBD part number 04725UPRE.

## Refurbished Systems and Components

Please visit our Web site at [RBD Enterprises - Products - Used Equipment](#) when you are looking for used surface analysis equipment such as ion guns, analyzers, or controls. All RBD refurbished optics includes a one-year warranty. If you are selling a used system or used components, please contact us at [sales@rbdenter.com](mailto:sales@rbdenter.com).

## Obsolete DACs for PHI Systems now being remanufactured by RBD Enterprises

On some of the older PHI systems, the DACs (digital to analog converters) are no longer produced and not even available from specialty surplus houses. That could mean that if your system loses one of these DACs, the system may no longer be repairable.

Luckily, RBD is in the business of maintaining and upgrading older PHI systems. We have begun to re-manufacture some of these DACs as the need arises. Currently, we are remanufacturing these obsolete DACs:

Description	System(s) used in:	PHI Part Number	RBD Part Number
HDH1205	650, 660, 4300	612585	HDH1205RE
9331-16-6	600,650, 660, 4300, all 5000 series	604172	9331166RE
9377-16-4	All 5000 Series	607411	9377164RE

You will also be pleased to know that we are providing these parts for less than PHI or other companies are charging.

If your system requires an obsolete DAC or other part that is no longer available, please contact us and we will find an affordable solution for you.

### Tech Tip: Source For High Vacuum Bellows

Mewasa provides high vacuum bellows with short lead times and at a very competitive price. For more information, visit their web site at the following link:

[http://www.mewasa.ch/e/index\\_e.html](http://www.mewasa.ch/e/index_e.html)

## **NEW! RBD Model EGC 200 5kV Electron Gun Control**

The Model EGC 200 5kV Electron Gun Control is the RBD replacement for the PHI™ 11-010 Electron Gun Control. Many of the 11-010 units in the field are over 20 years old and becoming more expensive to service. The EGC 200 provides all of the functionality of the 11-010 with improved performance and control features. These features include remote programmability by an analog 0-to-plus 10-volt input, a RS232, or a 488 interface (software included).



The EGC 200 will work with any analyzer that currently uses an 11-010. These include the 10-150, 10-155, 15-155, and 15-255G analyzers. It will also control OEM analyzers and stand alone electron guns. Please download the [PDF datasheet](#) for complete details.

## **NEW! RBD Model MAC 200 Multiplier / Analyzer Control**

The MAC 200 Multiplier / Analyzer Control is designed to replace the PHI™ 32-100 Electron Multiplier supply and the PHI 32-150 AES Analyzer control.

The large front panel LCDs can be seen from across your lab so that you know exactly what your multiplier voltages are set to at any time.

Designed for versatility, the CMA and SED multiplier supplies and AES analyzer supply can be operated via the DR11 bus, analog front panel potentiometers or with an analog 0-to-10 Volt DC remote programming voltage.

The base unit includes any one of the high voltage modules (CMA, SED, AES). You can mix and match as needed from a single multiplier supply up to two multiplier supplies and one CMA supply, all located in one convenient unit. This design provides savings that are passed on to you, resulting in a very cost effective solution for new or replacement electron multiplier or AES analyzer control.

The MAC 200 will work with all PHI AES systems. Please download the [PDF datasheet](#) for complete details.

**Tech Tip: 20-622 Steering Voltage Adjustment Procedure.**

**Overview:**

The Condensor and Objective steering voltages in the 20-622 need to be adjusted periodically for optimal image stability. Following this procedure will ensure that the steering voltages are operating properly and also that they are properly balanced.

**Summary Table:**

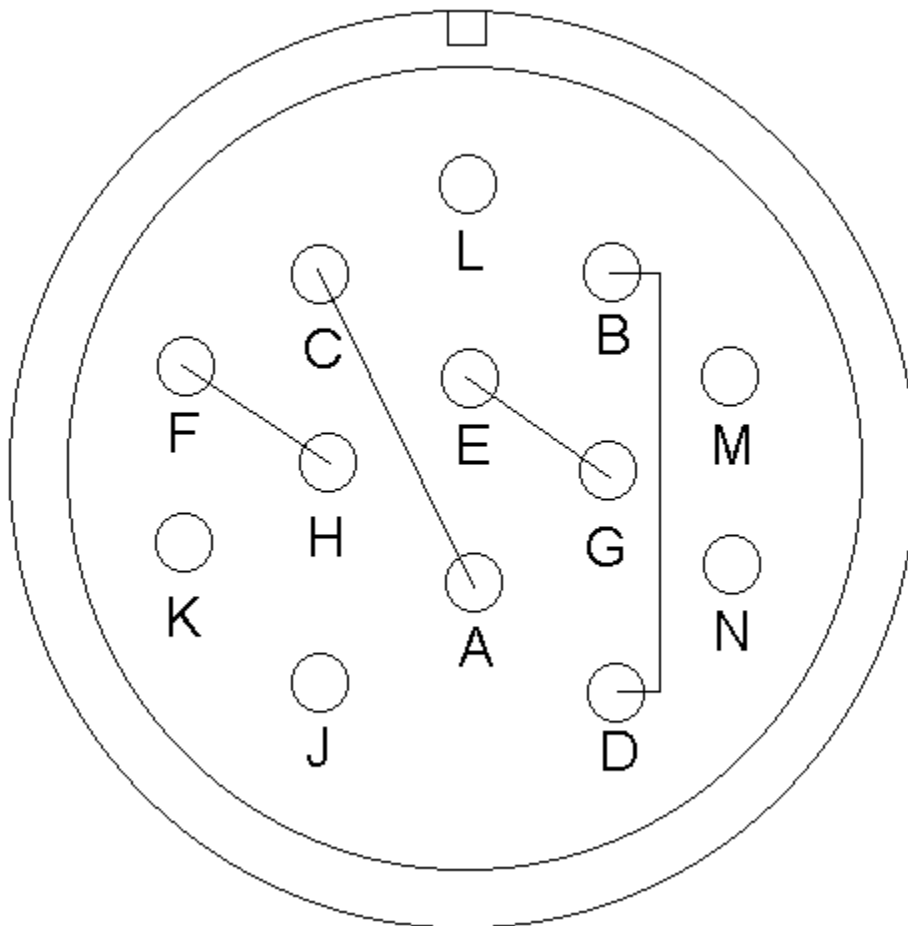
J3 Pin	Description	Offset Pot	Gain Pot	Deflection Bd. Pin	Lens Bd. Pin
A	COND X	R 27	R 25	Defl 1 pin 8	58
C	COND X	R 27	R 25	Defl 1 pin 10	58
B	COND Y	R 23	R 22	Defl 1 pin 62	50
D	COND Y	R 23	R 22	Defl 1 pin 64	50
E	OBJ X	R 36	R 35	Defl II pin 7	66
G	OBJ X	R36	R 35	Defl II pin 9	66
F	OBJ Y	R 34	R 33	Defl II pin 61	56
H	OBJ Y	R 34	R 33	Defl II pin 63	56

**Procedure:**

1. Turn **OFF** the 20-610 30kV High Voltage Supply.
2. Remove the 20-622 from the electronic console and extend the Lens control card (second board from the top). Support the Lens board so that it is level with a non-conductive object. Remove all cables going to the 20-622 except for the power and the 40-pin ribbon cable between the PC147 and the 20-622.
3. Connect a DVM between pins A and C on the J3 COND & OBJ Steering connector on the back of the 20-622.
4. Turn on the 20-622 and in AugerMap dialog box, set the Beam voltage to 20kV and also set the COND X steering to 50% (mid-range).
5. Adjust R 27 on the Lens control board for zero volts DC on the DVM.

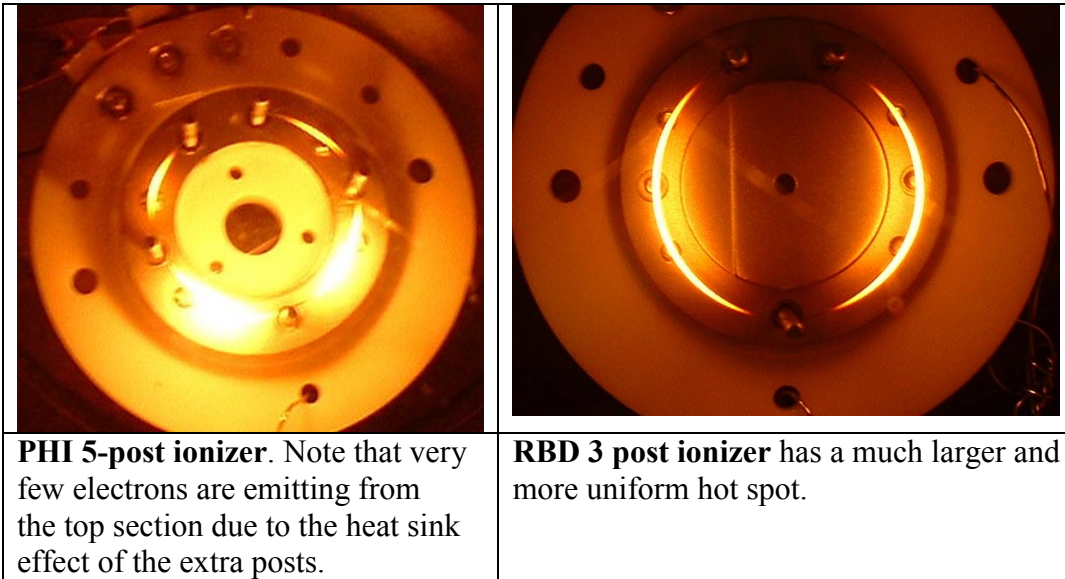
6. Set the COND X steering to 100% and adjust R 25 for 250.0 volts DC.
7. Connect the DVM between pins B & D on J3.
8. Set the COND Y steering to 50% and adjust R 23 for zero volts DC.
9. Set the COND Y steering to 100% and adjust R 22 for 250.0 volts DC.
10. Connect the DVM between pins E & G on J3.
11. Set the OBJ X steering to 50% and adjust R 36 for zero volts DC.
12. Set the OBJ X steering to 100% and adjust R 35 for 250.0 volts DC.
13. Connect the DVM between pins F and H on J3.
14. Set the OBJ Y steering to 50% and adjust R 34 for zero volts DC.
15. Set the OBJ Y steering to 100% and adjust R33 for 250.0 volts DC.
16. Set the COND X, COND Y, OBJ X, and OBJ Y steering to 50%.
17. Set the Beam Voltage to 3kV.
18. Check each pin again with respect to the chassis. They should all be zero volts within 50 mV DC and be stable. If they are not stable, the 7541 DACs or 208H OP AMPs on the error control board are usually the problem. Try replacing them and re-calibrating.

**Figure of J3 - COND & OBJ Steering Connector on back of 20-622**



## RBD 04-303 and 06-350 Ionizer Rebuilds –Seeing is believing

As you probably already know, RBD Enterprises' proprietary technique for rebuilding the PHI 04-303 ion gun and 06-350 ion gun ionizer assemblies results in more stable sputter rates and longer filament lifetimes. The pictures below are actual ionizers that show the visible light emitting from the filaments. Note that the 3 post RBD ionizers have a much larger and more uniform hot spot than the 5-post PHI filament. In terms of performance, a more uniform hot spot results in a more uniform beam shape. In addition, even with the additional two unnecessary posts, the PHI filaments will still slightly warp out of position over time. That in turn changes the sputter rate of the ion gun, which can result in inaccurate data unless you recalibrate your sputter rate frequently.



In short, the RBD filaments outperform the PHI filaments, last longer, and cost less to rebuild. So the next time your 04-303 or 06-350 ion gun needs an ionizer rebuild, be sure to send it to RBD and see the results for yourself.

### Tech Tip: 04-303 Ion Gun Shorting-Out Problem

On the 04-303 ion gun, every time the ionizer is changed there is a chance that flakes of deposited material inside the ion gun can become loose and short-out the ion gun. If that happens, there are two options:

1. Remove the ion gun from the system and remove the ionizer assembly. Then, using high-pressure air (nitrogen preferred) with a pressure of 40 to 60 PSI, blow out the gun thoroughly. Sometimes, the flakes will blow away.
2. If blowing out the gun does not work, then the ion gun needs to be completely rebuilt. RBD provides this service for \$2,495, which includes a total tear down and cleaning,

replacement of all defective parts, re-assembly, alignment, and UHV burn-in prior to shipment. We can even provide a loaner ion gun at no additional charge to use while yours is being rebuilt. This is about one-half the price of what PHI charges for the same service (although PHI does not use our propriety technique which prevents the filament from warping).

## **RBD Enterprises Contact Information**

### ***To contact us:***

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