

EDAX Genesis 2000 Operating Instructions

October, 2007 - V 0.80

LN₂ COOLING:

- The detector is allowed to warm up between uses. A **Red** Bias light on the EDAX computer & detector unit indicates the detector is too warm. **GREEN** or flashing **GREEN** light detector is ready.
- The detector takes ~ 1½ dewars (5-6 L) of LN₂ to cool and fill, and lasts ~ 36 hours.
- Allow detector 30mins at temperature (**GREEN** Bias light) before collecting data.

Startup:

1. Login to Zeiss Computer, and startup SEM as normal. (If analyzing offline you do not need to startup the SEM)
2. Login to EDAX Computer [Using EMFuserID and Password]
3. Start **EDAX GENEIS**Software.

MICROSCOPE:


1. Place sample at **8.5mm working distance**.
2. Use appropriate accelerating voltage (i.e. 1.5 - 3.0x the maximum energy line you are planing on detecting).
3. Set sample tilt to 0.00 degrees

EDAX SOFTWARE

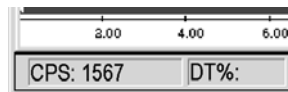
SPECTRUM tab

- Make sure the EDAX unit is ON with **GREEN** light displayed on front of unit

COLLECTING A SPECTRUM:



1. Clear existing spectrum data if needed  ; “**CLEAR ALL**” removes all the saved elements and their peak labels

2. Look at count rate [Lower left corner]
CPS:= “Counts per Second”



3. Adjust count rate to between 2500-6000CPS by changing **APERTURE SIZE** on microscope. Larger aperture size = higher count rate. [Changing sample area, magnification, etc. will change count rate requiring readjustment]

Manual collection Stop:

4. Set **PRESET** collection to “**NONE**”
5. Start collection by clicking on 
6. Stop collection by clicking on  again.

Auto collection stop:

7. Change **PRESET** desired Data collection stopping point

NONE := Manual starting and stopping (Typical setting)

LIVE := Automatically stop data collection after XXX live time collection

CLOCK := Automatically stop data collection after XXX Seconds

ROI := Automatically stop data collection after XXX x-rays collected in selected ROI (Region Of Interest).


Setup → ROI/Ratemeter. Click  to return to collection


8. Start collection by clicking on

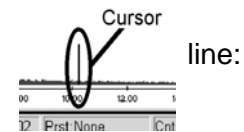
RESIZING SPECTRUM DISPLAY:



- Use the resizing button to zoom in or out from regions of the spectrum for ease of identification.

- The  expand and contract around the black spectrum cursor

- The Reset icon  resets back to full width and height.



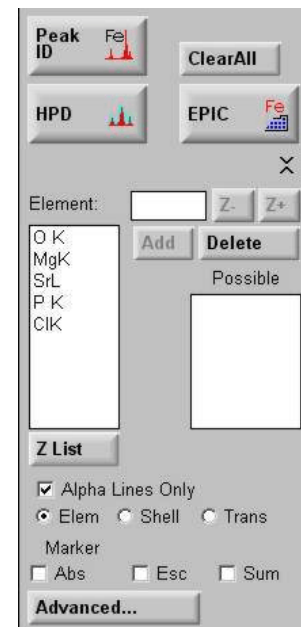
Peak Identification

1. Expand the “Peak Identification” panel:

- Manually type specific elements in the **ELEMENT** window (yes, it is greyed but you can type in the box).
 - You can “scroll” up and down the periodic table with the **Z-** and **Z+** buttons.
 - “Peak ID” will attempt to auto-identify the peaks, however results are often highly questionable.

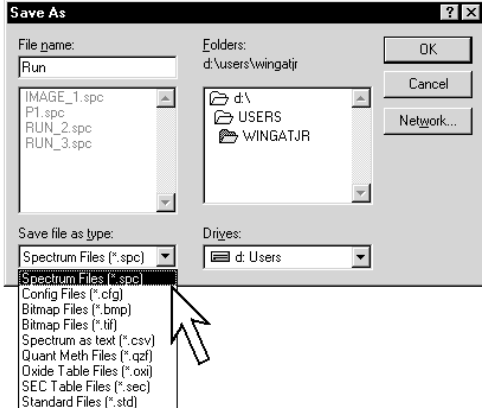
3. Labeling Peaks

- **ADD** will add labels for the currently selected element
- **DELETE** deletes the current element from the “Saved Element” list, i.e. removes the peak label(s) for that element
- **CLEAR ALL** removes all the saved elements and their peak labels
- **MARKER** Options:
 - Abs := Absorption edge for current element
 - Esc := Escape peak for current element
 - Sum := Sum peak for current element
- **AUTO** performs automatic peak identification and labels peaks



SAVING SPECTRA:

- Saving follows normal Windows conventions: **FILE > SAVE AS . . .**



- Save files in your file directory on the D:\ drive:
D:\users\Your-ID

- Useful File types:

- *.spc** **Default EDAX Spectrum format**
- *.cfg** Saves just current configuration information
- *.bmp** Saves Spectrum as a bitmapped picture
- *.tif** **Saves Spectrum as a TIFF image**
- *.csv** **Delimited text file → readable by Excel and other programs**


PRINTING SPECTRA:

- Printing follows normal Windows conventions: **FILE > PRINT** will print the visible area of the currently active spectrum window.
- Use **FILE > PAGE SETUP** to control how and what is printed
- creation of PDF's is a printer option.


Quant:


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IMAGE Tab


- Setting up brightness and contrast for collecting an image from Signal A output of the Supra.
- During image capture the EDAX system will “take over” beam control of the Supra, press  to switch scan control between the two systems

MAPS/LINE Tab

- During image capture the EDAX system will “take over” beam control of the Supra,
press  to switch scan control between the two systems

1. Set display mode to one of the spectrum windows
2. Click the **COLLECT** spectrum button
3. Identify elements/peaks of interest
4. Click the Maps button for collecting a map
5. Chose mapping mode - LIVE
6. Right-click on **RESO/DWELL/ROI** to Setup mapping conditions
 - Resolution: “pixel” or point resolution of the mapped area
 - Dwell: time to collect at each point (200 typical)
 - Frames: # times to scan the area (8 or 16 typically)
7. Click “Use Z List” to import the Peak ID’s from Step #3.
8. Expand the Z List options :
 - a. Click on listed elements change the colors.
 - b. <CTRL> click to highlight elements to select elements to map - ONLY highlighted elements will be mapped
 - c. To add elements expand the peak ID options menu and manually add the elements, then deselect & re-select the “Use Z List” to import the list again.
8. Click “**COLLECT MAPS**” button.
 - a. Set location, filename and format for storing the collected maps
 - b. Verify the collection parameters, click o.k.
 -  to abort Left-Click **COLLECT MAPS** button

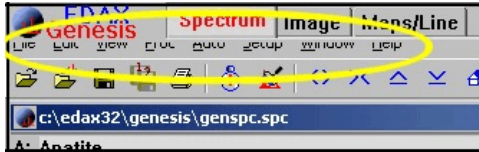
Printing Maps:

- Use ACDSsee  Easier and more flexible
- Use EDAX

FIXING DISPLAY:

- By default the display settings may not allow the Pull down menus to be readable. To fix do the following:

1. Right click on the windows desktop, go to **PROPERTIES**
2. Go to the **APPEARANCE** tab.
3. Select the **ADVANCED** button.
4. Under **ITEM** Select "**MENU**"
5. Change **SIZE** to 30, press **OK**, and **APPLY**
6. Check the Menu display in the EDAX software.



EDS ... EDAX ... WHAT'S IN A NAME?

"This name problem has been around for 30 years! Back in 1971 John Russ edited a little book called Energy Dispersive Analysis of X-rays published by the ASTM. Then Nuclear Diodes, Inc, renamed themselves EDAX and the competition could not use that trademarked name. John worked for EDAX and promoted the technique as "EDAX". KeveX had a book published in 1973 called "Everything you wanted to know about XES (X-Ray Energy Spectrometry)" but that name did not stick. EDS and EDX have stuck and are the most popular.

I once wrote a paper on filter use for "EDXRF" (Energy Dispersive X-Ray Fluorescence) and it did not get listed in abstract indexes of X-Ray papers because they did not recognize the name! I think EDS is a bad name, but I use it because others understand what I mean."

- - Ronald Vane, XEI Scientific. August 2001 Microscopy Listserv

XEDS = X-ray Energy Dispersive Spectroscopy

XWDS= X-ray Wavelength Dispersive Spectroscopy

which is completely analogous to

EELS = Electron Energy Loss Spectroscopy

It is the most logical since EDS does not say what you are energy dispersing and EDX is not quite a full descriptor.

However, EDS, EDX, EDXS are used often in the literature.

EDAX = is a company that manufactures and sells XEDS systems