This presentation is designed to provide a step-by-step followthrough. If you have any questions, do not hesitate to contact us.

Make sure you do not overwrite existing energy and preset options associated with calibrations. Only edit settings you are comfortably having changed. Calibrations will not function if you are collecting data with different energy and current than your reference standards.

<u>The Tracer series employs a 4 watt bulb. Your energy</u> <u>multiplied by your current will equal the wattage you are</u> <u>using.</u>

#### <u>NEVER GO ABOVE 4 WATTS - THIS WILL DESTROY</u> <u>YOUR TUBE.</u>

It is strongly recommended that you keep settings below 1.5 watts, this will lengthen the life of your tube.

To calculate your wattage, multiply energy by current.

For example, 40 keV x 30  $\mu$ A = 1200 = 1.2 watts 15 keV x 25  $\mu$ A = 375 = 0.375 watts

Finally, before beginning any changes to your X-box settings, record all existing settings - at minimum take a screenshot of the computer screen when you first load your Tracer's settings so that if a mistake is made, you can re-input all of the original factory presets.

	Bowls.	€		Bruker AX	S Handh	eld Inc. Tub	oe Setting	gs / Monitor	r		×
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#### When you first open up X-Ray Ops, the screen will be blank

Windows 8.1 Pr Build 960

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Radioactive Sample A...

Radioactive Sample A...

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Need for Vacuum.do	Masami-S cx	an									
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The final column includes your filters. If you manually use filters, you may not want to change these. If, however, you have a Tracer IV or a model which has a filter wheel, these will be important to specify

	BRUKE		
This PC	•	Read and Set filter layers — — ×	
		Bruker AXS Handheld Inc. Tube Settings / Monitor	
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Assorted	Filter #2	• 198	• 222	C 40	kV C	30 μA		200	3 A	node Current (µA) Actual FG DAC	0.00
The	Filter #3	÷ 223	÷ 228	C 40	KV OZ	43 μΑ 25 μΑ		200	4	FG Current (mA) Anode diode	8
Dropbox	Filter #4	▲ 167	206	C 40	kv C	11 μA		200	1	Cathode diode	137
Shortcut	Filter #5	• 167	<u>▲</u> 206	(• 40	_ kV	l1 μA ip reread	Γ	200	1	Input Voltage Input Current	14.4 21
		Pulse Length 200 Pulse Period 254	Aub	o Mode Re-R be Enabled Setti	read Upda	ate Start	Update	e Actuals	Monitor Actuals	Pulse Length Temp.	200
olives.xlsx	Turke	Log Data to File:							Start Logging	Filter	0
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Radioactive	MA2.CF	z									
Sample A	h										
Radioactive Sample A	Shika yello filter	W									
MA -											

The last column features the actual settings when you test your parameters

> Windows 8.1 Pi Build 960

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![](_page_19_Picture_4.jpeg)

Need for

Masami

Masami-Sar

K0741

BRUKE

ilter Ser

Light Pipe

Filter #2

Filter #3

Filter #5

Comm Port # 9

High Voltage

+ 198

+ 198

+ 223

+ 103

+ 167

+ 167

Pulse Length 200

Pulse Period 254

Open XRay Comm Port 🕞

Filament Current

Settinas

+ 224

+ 222

+ 222

+ 228

+ 222

206

206

Auto Mode

Tube Enabled.

This PC 😪

Recycle B

Assorte

Things

7

Dropbox

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X

olives.xls

BRUKER

Read and Set filter layers

High Voltage

ADC Presets

0 15

C 40

C 40

C 40

0 15

C 40

• 40

Re-Read

Settinas

Bruker AXS Handheld Inc. Tube Setti

0 29

30

C 30

C 43

C 25

0 11

• 11

Update

Setting

🔽 Skip reread

Anode Current Anode

пΑ

μA 🗌

ADC Presets

HandShake 🔽

kV

kV

These settings are important for your calibrations, they will not function if you change the energy and current they are based on.

![](_page_20_Picture_2.jpeg)

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Bruker AXS Handheld Inc. Tube Settings / Monitor

BRUKE

ilter Ser

Light Pip

Filter #2

Filter #3

Filter #5

Masar

MA2.CE

Masami-Sar

K0741

Comm Port # 9

High Voltage

+ 198

+ 198

+ 223

+ 103

+ 167

+ 167

Pulse Length 200

Pulse Period 254

Log Data to File: Script File:

Firmware to Upload:

ADC/DAC Version:

Open XRay Comm Port

Filament Current

Settinas

224

+ 222

+ 222

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206

206

Auto Mode

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Masami

Things

BRUKER

Read and Set filter layers

Extended Actuals Version:1.2.21 High Speed Comms 🛛 🔽 HandShake 🔽 High Voltage Anode Current Anode Current Actual HV (kV) n n5 ADC Preset: ADC Presets Scale 0 15 Actual HVG DAC 167 C 29 VG Current (mA) C 40 de Current (µA) 🛛 🗤 C 40 200 Actual FG DAC 200 C 40 200 FG Current (mA) 0 15 Anode diode 4095 C 40 Here, I am selecting parameters • 40 Re-Read not used in any calibration, check Settings Tube Enabled with Bruker Elemental to find out what parameters your calibrations are based on

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![](_page_22_Picture_1.jpeg)

![](_page_23_Picture_1.jpeg)

![](_page_24_Picture_1.jpeg)

Here, we have the input voltage and current. These must be changed as well

33	Filter Sen:	Dpen XBay Co	mm Port		Hanus		_	_		30	WE NEUTRIN	
Recycle Bi	Light Pipe	High Voltage Settings	Filament Current Settings	High Voltage ADC Presets	5	Anode Current ADC Presets	t Ar	node Curren Scaler	<sup>t</sup> Pulse Length	Filter	Actual HV (kV)	0.05
		· 107	• 224	C  15	kΨ	C 29	μA		200	2	Actual HVG DAC	167
	Filter #1	198	• 222	C 40	k٧	C 30	μA		200	1	HVG Current (mA)	0
Assorted		198	222	C 45	kV	C 31	μA		200	3	Anode Current (µA)	0.00
Things	Filter #2	1000	- looo	C 10	- MA	0.0	A	_	-		Actual FG DAC	206
		• 223	• 228	· [40	KΥ	· [43	μα		1200	4	FG Current (mA)	8
<b>F</b> h	Filter #3	÷ 103		C 15	k٧	C 25	μA		200	2	Anode diode	4095
Drophor	Filter #4	+ 167	€ 206	C 40	kV	C 11	μA		200	1	Cathode diode	137
Shortcut	Filter #5	÷ 167	÷ 206	(• 40	kV	• 11	μA		200	1	Input Voltage	14.4
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alburgardian.		Pulse Period 254	Tube Er	nabled Setting:	s	Settings	otalt	Upda	te Actuals	Monitor Actual	s Temp.	26.1
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		Script File:	· · · · · · · · · · · · · · · · · · ·							Chart Corint	Flux	0
			1							Start Script		4095
		Firmware to Upload:								Upload Firmwa	re Vacuum	723
Radioactive	Masan		-								<u> </u>	

BRUKER

Read and Set

Obsidia

This PC 🛛 🕄

adioactive MA2.CF7

A eloma

![](_page_25_Picture_6.jpeg)

![](_page_25_Picture_8.jpeg)

Masami-Sar acuum.do

![](_page_25_Picture_10.jpeg)

![](_page_25_Picture_13.jpeg)

The current high voltage setting for 40 keV is 198 - it will likely have to be higher to maintain 45 keV

		• 1101	·		-	23			200	]2	Hotaditit a bha	1167
	Filter #1	• 198	1	C 40	kV	C 30	μA		200	1	HVG Current (mA)	0
Assorted		÷ 198	222	C 45	kV	C 31	μA		200	3	- Anode Current (μA)	0.00
Things	Filter #2	- 223	- 228	C 40	kV	C 43	μA	Г	200	4	Actual FG DAD	206
	Filter #3	↓ 102	▲ 222	C 15	- kV	0.25	ΠÅ	_	200	2	Anode diode	1 8
5		<ul> <li>■ 105</li> <li>▲ 107</li> </ul>	• 222		- W	0	- u A	_	200	12	- Cathode diode	137
Dropbox Shortcut	Filter #4		• 206	0 40	кv 	о <u>п</u>	μ.	-	200	1	- Input Voltage	14.4
Shontout	Filter #5	· 167	206	(•  40	kV	• 11	μA		200	1	Input Current	21
		Pulse Length 200	V Auto	Mode Be-Br	ad   [		_	1	PC Trigger		Pulse Length	200
	Tindeo	Pulse Period 254	🗆 Tub	e Enabled Settin	gs	Settings	Start	Upd	late Actuals	Monitor Ac	ctuals Temp.	26.1
Описылыл	101 KG	Log Data to File:								Start Log	ging Filter	0
		Script File:								Start Sc	ript IB LED	0
		Firmware to Upload:								Upload Firr	nware Vacuum	723
Radioactive	Masan	ADC/DAC Version:	0.11.2									_

Read ar

Comm Port # 9

This PC

Recycle

Radioactive MA2.CF2 Sample A...

Sample A... filter

![](_page_26_Picture_7.jpeg)

![](_page_26_Picture_8.jpeg)

![](_page_26_Picture_9.jpeg)

- 🤌 🚞 👂 💿 🚟 😪

![](_page_26_Picture_11.jpeg)

- 10:42 PM - トン 市 記 小 + 10:42 PM 6/10/2014

![](_page_27_Picture_1.jpeg)

![](_page_28_Picture_1.jpeg)

	BRUKE		1	iker				
This PC	٠	0	Read	and Set filter layers		_ 🗆 🗙		~
		*		Bruker AXS Hand	held Inc. Tube Settin	gs / Monitor		×
	Filter Sen:	Comm Port #	9 High Sper	ed Comms 🔽	Times	2 V Extended Actua	als Version:1.2.2	.21
Recycle Bi	Light Pipe	High Voltage	Filament Current	High Voltage	Anode Current Anode Curr	ent Pulse Length	Actual HV (M)	_
		Settings	Settings	C 15 kV C	ADC Presets Scaler	200 2	Actual HVG DAC 169	=
		198	<u> </u>	C 40 kV C	30 µA [	200 1	HVG Current (mA)	
	Filter #1	- 201	• 222	• 45 kV •		200	Anode Current (µA)	_
Assorted Things	Filter #2	<ul> <li>■ 201</li> <li>■ 202</li> </ul>	• ZZZ	(* 43 KY C		200 3	Actual FG DAC 206	
	Filter #2	• 223	• 228	C [4U KV C	43 µA	200  4	FG Current (mA) 9	
	Filter #5	103	- 222	C 15 kV C	25 μA Γ	200 2	Anode diode 4095	$\equiv$
Dropbox	Filter #4	• 167	206	C 40 KV C	11 μA Γ	200 1		
Shortcut	Filter #5	• 167	206	C 40 KV C	11 μA 🗆	200 1	Input Voltage 14.4	_
	1	Pulse Length 200	🔽 Auto Mod	te papad be	Skip reread	PC Trigger 🔽	Pulse Length 201	-
		Pulse Period 254	Tube Ena	abled Settings Set	tings Start Up	date Actuals Monitoring	Actuals Temp. 27.0	
olives.xisx	Jurke	Log Data to File:				Sart Log	gging Filter O	
		Script File:				tart So	cript IB LED 4005	_
	Xs I	Firmware to Upload:					Wacuum 723	_
Radioactiv	e Masan	ADC/DAC Version:	-					-
Sample Pa	Obsidia		0.1112					
E.								
Padlesette	o MA2/CT	-7/			(			
Sample A.	a Milazacia a	r/2.				The		
						Ine	n ciici	ΪK
Radioactiv	a Shika yell	low						
Sample A.	, filter							
W	En							
Need for	Masami-f	San						
Vacuum.do	CX	San						
Masami Sodimont vi	K0741+	÷						
Seument.x	5X							
	é [	🗧 🙆 🐧	o 🐱 (					

![](_page_30_Picture_1.jpeg)

![](_page_31_Picture_1.jpeg)

Build 960

	BRUKE			BRUKER							1		
This PC	�	<b>A</b>	Re	ad and Set filter Bruker AX	avers S Handheld Inc	_ D							
Recycle Bi	Filter Sen: Light Pipe	Comm Port # Open XRay Co High Voltage Settings	9 High mm Port 🗸 Filament Curr Settings	Speed Comms Hent High Voltage ADC Presets C 15	landShake Anode Curre ADC Preset kV C [29	Times 2 Load from nt Anode Current s Scaler µA 200		can tł	nen se	elect	a		
	Filter #1	÷198	• 222	C 40	kV C 30	μΑ 🕅 200	n	iew h	igh vo	oltag	e		
Assorted Things	Filter #2 Filter #3	→ 223 → 103	<ul> <li>↓ 228</li> <li>↓ 222</li> </ul>	C 40 C 15	KV C 43	μA [ 200 μA [ 200	se	etting.	in th	is ca	se		
Dropbox Shorievi	Filter #4	÷167	206	C 40		μΑ [ 200		0'	220				
	Filter #5	Pulse Length 200		Mode Re-Read	Skip reread	PC Trigge			230				5
olives.xlsx	Turke	Log Data to File:		Enabled Settings	Settings			Flux 0	A 1				
2	×	Firmware to Upload:	:				Start Script Upload Firmware	IR LED 4095 re Vacuum 723		(A)			1000
Radioactive Sample Pa	Masan Obsidia	ADC/DAC Version:	0.11.2		THROLEHOIL 1					IA		1/1	
Radioactive Sample A	MA2.CF	Z											
2													
Radioactive Sample A	Shika yell filter	9W											
Need for /acuum.doc	Masami-S x	ian											
Masami ediment.xls	K0741+												Windows 8.1 Pro
													Build 9600

A BRU	KER	BRURGER					1.		1
This PC	•	Read and Se Bru	et filter lavers Jker AXS Handheld Inc	Tube Settings / Monitor	_ 🗆 🗙				
Filter Se	en: Open XRay Com Pe High Voltage Settings	9 High Speed Comm nm Port I∕I Filament Current High Settings AD	™ I HandShake I Noltage Anode Curre CPresets ADC Prese	Times 2 🔽 Extended Actual	Save settings Actual HV (kV)		61		
Filter #1			kV         C         29           kV         C         30           kV         •         31           kV         C         43	μA [ 200 ]2 μA [ 200 ]1 μA [ 200 ]3 μA [ 200 ]3	Actual HVG DAC 225 HVG Current (mA) 405 Anode Current (µA) 31.05 Actual FG DAC 222				
Filter #3 Filter #4 Filter #5			KV C [25 KV C [11 KV C [11	μA [ 200 [2 μA [ 200 ]1 μA [ 200 ]1	Anode diode 8 Cathode diode 4095 Input Voltage 13.8 Input Current 276				
Ves.xkx Tur Ves.xkx Tur Norective Mass nple Pa Obsid	Pulse Length 200 Pulse Period 254 Log Data to File: Script File: Firmware to Upload:	Auto Mode     Tube Enabled	Re-Read Update Settings Settings	Start Update Actuals Minitoring A	Pulse Length 201 ctuals Temp. 28.2 ing Filter 0 Flux 0 IR LED 4095 Vacuum 722				
oactive MA2. ple A	lGfZ			T	o test	this, I c	can cl	ick	
itoactive Shika y	yellow er			'Mo	onitor	Actual	s' ther	ר'PC	
Need for Masar	ni-San					Trigge	r'		
Jum.docx	41+								
									3

	BRUKE	•		BRUKER						
This PC	€ .		Re	ad and Set filte	er lavers		_ 🗆 🔿	<		
		*		Bruker A	AXS Handheld II	nc. Tube Set	tings / Monito	or	-	
	Filter Sen:	Comm Port #	9 High	Speed Comms 🛛 🖡	~	Tim	es 2 🔽 🛛 Ext	ended Actuals 🔽	Version	:1.2.2
Recycle Ri		Open XRay Cor High Voltage	mm Port 🔽	nt High Voltar	HandShake 🔽	urrent Anode C	Load from file	s Save	settings	
месусте в	Light Pipe	Settings	Settings	ADC Prese	ets ADC Pre	esets Scal	er Pulse Lengt	h Filter	Actual HV (kV)	45.15
		• 107	• 224	C [19	29		200	2 A	/G Current (mA)	225
	Filter #1	198	222	C 40	kV C  30	μA	200	1	de Current (uA)	400
Assorted	Filter #2	<u>▲</u> 230	• 222	• 45	kV 🕫 31	μA Γ	200	3	Actual FG DAC	222
Things	1 11(61 #2	▲ 223	228	C 40	kV C 43	μΑ 🗖	200	4	FG Current (mA)	146
<b>N</b>	Filter #3	÷ 103	• 222	C 15	kV C 25	μΑ 🗆	200	2	Anode diode	8
	Filter #4	+ 167	* 206	C 40	kV C 11	μA 🗆	200	1	Cathode diode	4095
Shortcut		167	206	C 40	kV C 11	μA	200	1	Input Voltage	13.8
	Filter #5				🔽 Skip rere	ad	PC Trigger		Input Current	276
		Pulse Length 200	✓ Autol	Mode Re-Re Enabled Settin	ead Update	Start	Jpdate Actuals	Monitoring Actuals	Pulse Length	201
olives.xlsz	r Turke	Les Data la File					·	Start Longing	Filter	0
		Script File:					*	Charl Cariat	Flux	0
- 5	X							Start Script	IR LED	4095
		Firmware to Upload:						Upload Firmware	Vacuum	722
Radioactiv Sample Pa	e Masan Obsidia	ADC/DAC Version:	0.11.2		THREE LINES. 1					
Radioactiv	e MA2.CF	Z								
Sample A.										
Sample A.	e Shika yeli 	DW/								
Need for	Masami-S	an								
Vacuum.do	CX									
Masami Sediment.xl	K0741+ sx									
			BRUKER							

![](_page_34_Picture_2.jpeg)

When the Actual energy and current match my target energy and current presents, then you have successfully reprogramed the X-box