Number: _____07_____

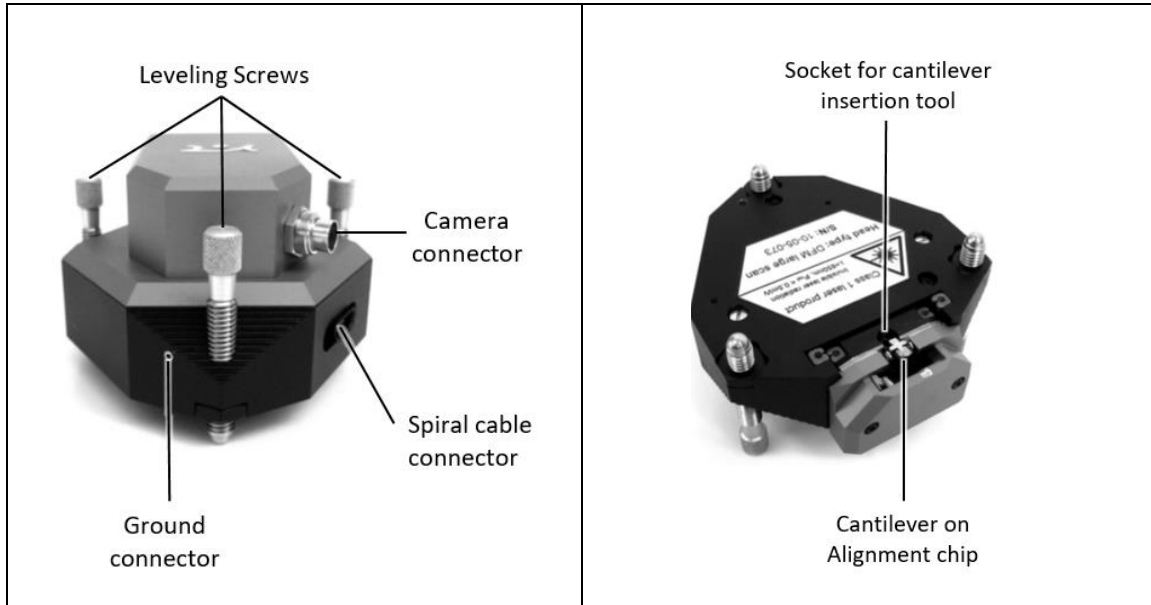**WORK INSTRUCTION BREAKDOWN SHEET**

Operation: Atomic Force Microscope (AFM) <mark>Startup/Shutdown</mark>
Instrument: Nanosurf Easyscan 2 AFM
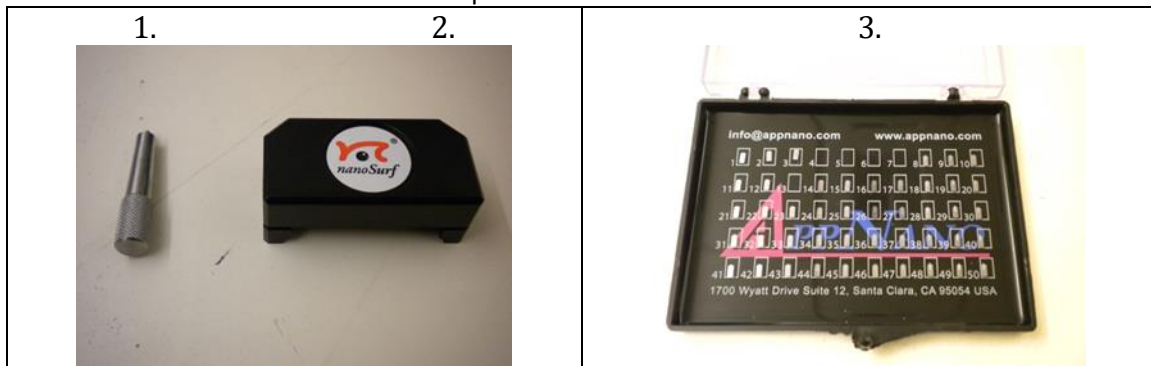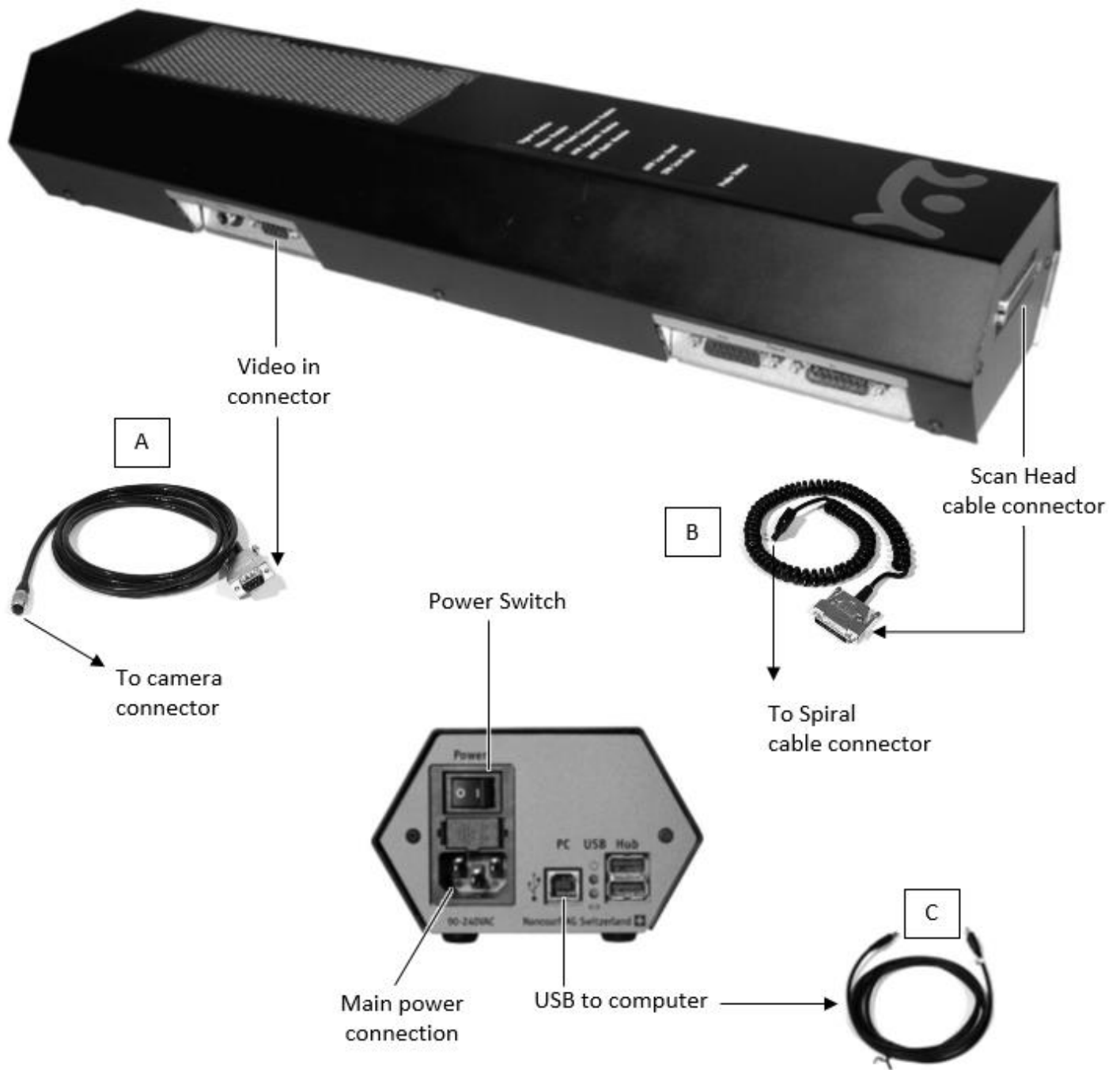
AFM Components

Scan Head

Accessories

1. Cantilever tip insertion tool
2. "DropStop" tool
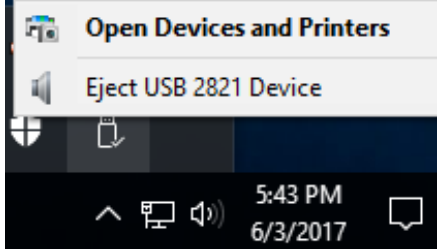3. Box of 50 AFM cantilever tips

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Controller and Cables

Video in
connector

A

To camera
connector

Scan Head
cable connector

B

To Spiral
cable connector

Power Switch

Power

PC   USB   Hub

Main power
connection

USB to computer

C
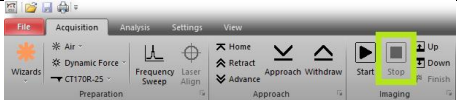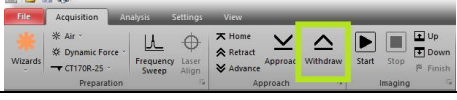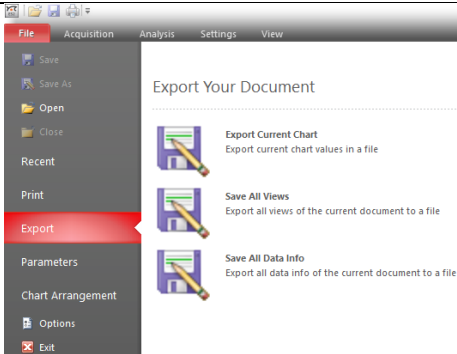
IMPORTANT STEPS	KEY POINTS	REASONS WHY
A logical segment of the operation when something happens to advance the work.	**Anything in a step that might:** 1. **Make or break the job** 2. **Injure the worker** 3. **Be a Cultural Consideration** 4. **Make the work easier to do (i.e., "knack", "trick", special timing, or bit of special information).**	**Reasons for each key point**
Check Controller and Cable Connections		
Verify cable A is connected between video port on the side of Controller and camera port on AFM scan head.	Refer to the lettered tape on instrument cables as well as the "Controller and Cables" image on previous page.	Minimizes potential for poor quality images and/or poor quality signal/data due to hardware connections.
Verify cable B is connected between rear port of Controller and AFM scan head.		
Verify cable C (USB) is connected between front port of Controller and USB port at rear of computer/CPU.		
Verify power cable is connected between front port of Controller and UPS on table behind black plastic AFM isolation box.		
Power On		
Turn on the computer.		
Log in to the computer using "shine_nano" as the password.		
After desktop start-up has completed, turn on the AFM Controller.	*After* desktop start-up has completed, flip the AFM Controller power switch to "**|**" (located on front of Controller).	
Ensure computer recognizes AFM Controller "Device".	• Click the "Hidden Device" icon (**^**) located at the right end of the taskbar near the clock. • Click the USB icon (reads "Safely Remove Hardware and Eject Media" when cursor hovers over it). • If Operator observes "Eject USB 2821 Device", this verifies computer recognizes AFM Controller and Operator can continue.	
Proceed to "Atomic Force Microscope (AFM) Operations" Work Instructions (See Number: __08_)		

Shutdown		
When scanning is complete, click the "Stop" button.		
Withdraw the tip from close contact with the sample by clicking the "Withdraw" button.		
"Home" the Scan Head and cantilever tip.	Once withdraw has completed, LEFT CLICK the "Home" button to move the cantilever tip away from the sample surface.	
Put on clean, disposable gloves.		
Raise AFM isolation box lid and gently place in fully open position.		
Remove the loaded sample holder.	When the cantilever tip is out of the way, *carefully and slowly* slide the loaded sample holder out from under the AFM scan head.	
Gently close the AFM isolation box lid.		
• Remove the sample assembly from the magnetized sample holder. • Return the magnetized sample holder.	• First, use rounded black plastic-coated tweezers to slide sample assembly so that it is slightly hanging over the edge of the magnetized sample holder; • Then use other broad-tipped tweezers to grab and completely remove sample assembly. • Finally, return the magnetized sample holder to the AFM isolation table.	**Image: Rounded Black Plastic-Coated Tweezers** **Image: Broad Tipped Tweezers** Using black plastic-coated tweezers minimizes potential to scratch the surface of the magnetized sample holder.
Remove disposable gloves.		
Export and Save Operator's AFM scan data and then close software.	• Click "File" tab; • Select "Export"; • Choose any/all Save or Export options • Close Nanosurf Easyscan 2 software	
Power off the computer.		
Power off AFM Controller.	• Flip the power switch to "**O**" (located on front of AFM Controller). • All LED lights on top of AFM Controller will darken when power is turned off.	

[1] Adapted from Graupp, P. & Wrona, R. (2006) The TWI Workbook: Essential Skills for Supervisors. New York, NY. Productivity Press.