

MULTI PROBE

**The Care, Handling, and
Installation of an
AFP Probe Tip**



The Care, Handling, and Installation of an AFP Probe Tip

These guidelines are presented to help insure that the user realizes the maximum life expectancy of the precision AFP Probe Tip, in addition to acquiring the best data possible. Please be sure that all users are properly trained to use these techniques. MultiProbe engineers are available to assist with any questions that may arise.



Always wear an anti-static wrist strap, grounded to the tool, while changing an AFP Tip. Never handle any portion of an AFP Tip with your fingers. Natural oils from the skin provide a leakage path across the signal and guard of the probe's triax cable. Once installed in the AFP, the Tip is safely grounded.

1. Tip Installation

1.1 The Tip Box and AFP Tip Data Sheet

- Each AFP Tip is shipped in a Tip Box designed to protect it from physical shock, corrosion, and electrical or static damage. (Image 1)
- The new Tips have a shelf-life of approximately 4-6 weeks when stored in a nitrogen cabinet. If stored only in an anti-static bag, that time could be cut by as much as half.



Image 1. AFP Tip Box

- Provided with each Tip Box is a AFP Tip Data Sheet. (Image 2)
- Listed on the data sheet is the Tip serial #, Tip radius, Laser alignment SUM, and the contact resistance.
- Each probe Tip has been pre-qualified for an alignment SUM of > 3 volts, and a contact resistance of $< 100 \Omega$

Box #	Probe Type	Serial #	Radius	Sum	Resistance
825	AFP-65	0.9.6	(4.1)	(3.25)	(.0K)
		1.2.7	(6.4)	(3.41)	(.0K)
		0.6.7	(4.2)	(3.41)	(.0K)
		3.1.9	(8.3)	(3.25)	(.0K)
		1.6.5	(5.7)	(3.32)	(.0K)

Image 2. AFP Tip Data Sheet

1.2 Positioning the head and removing the old Tip

- Begin by retracting the A-Zoom and lowering the sample stage.
- Retract each head receiving a new Tip approximately 10mm from its center using the Y micrometer.
- All other Heads should be retracted 1mm to insure that their Tips are not damaged during the exchange process.
- Using the dovetail clamp thumbscrew, secure the Head 25mm above the other heads by lifting the head up. (Image 3)
- Attach the anti-static wrist strap prior to removing the Tip Box from the static bag.
- Grasp the existing Tip across the center of the PCB and gently pull straight away from the Head.
- Place the Tip into an empty slot in the Tip Box. (Image 4)



Image 3. Thumbscrew

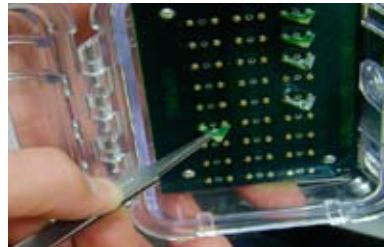


Image 4. Replacing the AFP Tip

1.3 Installing a new AFP Tip

- Prior to grasping a new AFP Tip, ground the tweezers to the Tip ground solder pad inside the Tip Box.
- Grasp the Tip across the center of the PCB, and gently remove from the holder inside of the Tip Box.
- Close the Tip Box and set it down as soon as possible. This will minimize the possibility of accidental physical damage to the other probes.
- Insert the Tip into the AFP Head with the serial numbers up. All three alignment pins must be inserted and seated squarely as pictured. (Images 5 & 6)



To avoid damaging the Piezo motors inside the AFP Head, do not insert the AFP Tip with excess force .

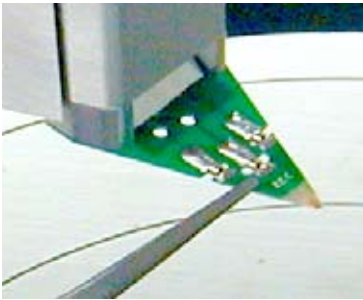


Image 5. Inserting the AFP Tip

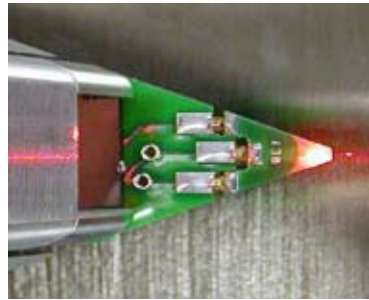


Image 6. Probe seats flush

- Gently lower the Head back into the clamp until it hits the dovetail stop block.
- Firmly tighten the thumbscrew to lock the Head into place.



Return the Tip Box to the static bag and place the bag into a nitrogen cabinet as soon as the tip exchange is complete.

2. Tip Alignment Procedure

2.1 Initial Alignment

- Turn on the laser via the MultiScan software tab marked “Setup”. The LED on top of each AFP Head will be illuminated when the laser is activated.
- Select the software tab marked “Align Laser”, and choose the appropriate Head from the drop down menu. You will see the Laser Position quadrant displayed with a red dot in the center. The gauge marked “SUM” will be at or near zero volts. (Image 7)

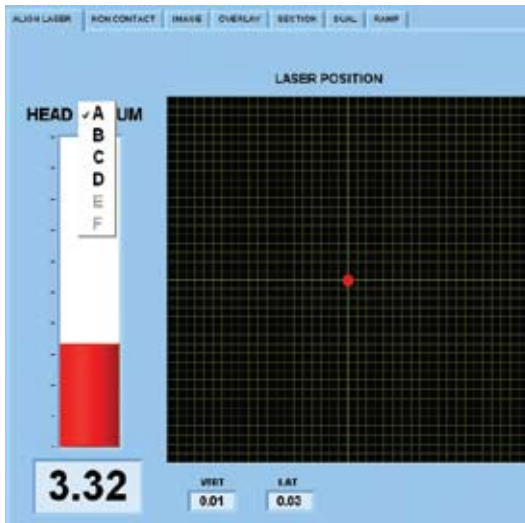


Image 7. Align Laser Screen

- Adjust the knobs marked LSR VRT and LSR LAT on the top of the Head. The beam will move toward or away from the probe tip. As it centers on the end of the Tip, it will reflect the laser, causing a slight increase in the SUM voltage. This can be observed by watching the laser spot on the AFP Tip, rather than the software screen.
- Use all 4 knobs to center and maximize the SUM gauge.
- The initial alignment procedure is complete once the SUM value is over 3 volts and the laser spot is near the cross hairs on the photo detector screen. Please note: the laser spot can align to a variety of locations on the AFP cantilever, and all will return the laser beam back to the Head. The following steps insure that you have aligned the spot to the location of greatest sensitivity and best image quality.

2.2 Precision Alignment

- Move the laser up and down on the reflective cantilever using the LSR VRT knob. This is referred to as “sweeping the lever.” As the operator sweeps the lever up and down, the laser spot on the photo detector screen will follow a path like that of a question mark. This path is designated by 3 areas. The top portion of Area 2 will provide the maximum resolution with the least amount of axial coupling. (Image 8)
- The highest SUM voltage output is not always the optimal place for the laser alignment. Trace the Question Mark and find the top of Area 2. With this area established, sweep the cantilever laterally using the LSR LAT knob to maximize the SUM for **this** vertical location.
- Finally, center the cursor onto the cross hairs using the PD VRT and LAT knobs. The SUM voltage should not change a significant amount as the cursor is moved.

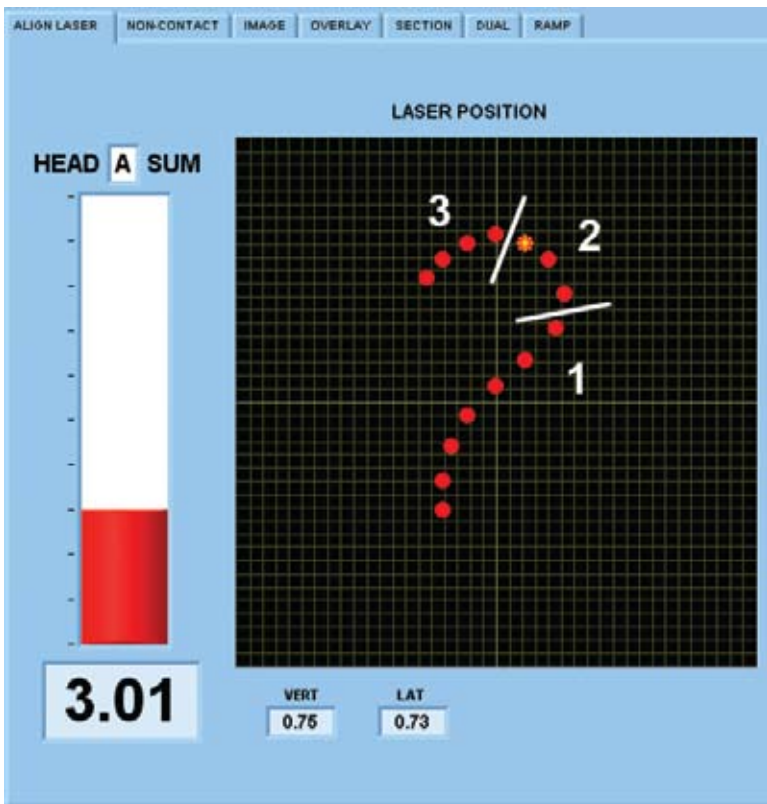


Image 8. “The Question Mark”

The position marked with the yellow asterisk in Area 2 is the optimal alignment location. Note that this “question mark” is idealized and in real practice it will be different and might be flipped.

Please contact sales@multiprobe.com for AFP Tip related issues

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