

## 5. Optimizing the Process (FOCUS and/or EXPOSURE matrix)

The system is calibrated weekly on 4inch Si wafers using resist SPR 955-0.9 and standard chuck (4"-500um). Your substrate type, thickness, and resist may require different focus and exposure setting than the standard calibration. A focus and/or exposure matrix should be done for each resist, to tweak your process relative to the calibration baseline. Once the process is optimized for a specific resist, the exposure time/focus will not change in the future, since the lamp power is constant all the time. The focus and/or exposure can be varied across this array to determine the optimum focus relative to the baseline. One focus step is equal to 0.1 um of focus depth. Focus offset is always an integer!

**+1=0.1um of lens movement up from the wafer**

**-1=0.1um of lens movement down toward the wafer**

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1. LOG IN to [10,1]
2. Type MODE and set the chuck size for your substrate
3. LOG OUT from [10,1] and LOG IN to your account [10, xxx]
4. Load your reticle. Align it manually to the system.
5. Use the command **EXPO jobname\pass name** and hit enter
6. You can use one of your already defined jobs/passes with your highest resolution mask to optimize the process.
7. Enter starting row within array specified in the pass
8. Enter ending row within the array specified in the pass
9. Enter starting column within array specified in the pass
10. Enter ending column within the array specified in the pass
11. Enter **F=to vary the focus, E= to vary the exposure, or R for both** (to increment **focus** for each row **and exposure** for each column within the array)
12. Enter the parameters as prompted by the computer. They will differ based on which option is chosen
13. Press **RESET** on the small keyboard, and then the **MAN** and **S\C** simultaneously
14. Wait 5-10 seconds and press **MAN** again
15. If you are doing an aligned test (like for exposure on top of a mesa) align the wafer now, press "EXP"
16. If you are NOT doing an aligned test, just press "EXP"
17. The command **EXPO** will shoot a specified serpentine array based on the parameters in your job/pass (first exposure - upper left corner)
18. When exposure is finished, follow the recipe (post exposure bake if needed) with development. Please take your time for inspection, and select best exposure time and focus.
19. The computer will ask you for the best row and column (enter row and column number)
20. The computer will give you the focus and exposure based on the row and column you input
21. **Do not update system focus!** Input a focus offset into your own exposure job. (If you update the system focus, you must change it back using the MODE command)
22. Unload the mask plate, and LOG OUT