

SUPERIOR ELECTRONICS

AFPP 300upg OPERATIONS AND MAINTENANCE MANUAL

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95/98**

MSR 480-705-9717

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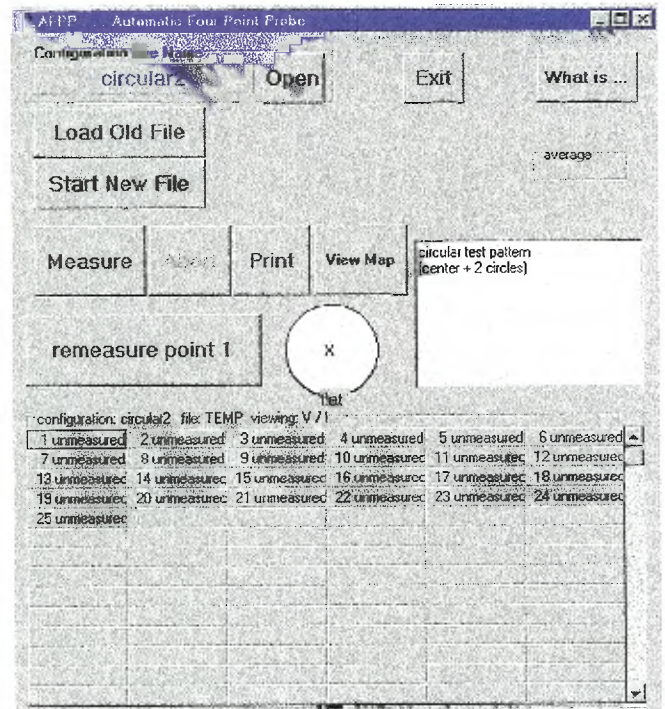
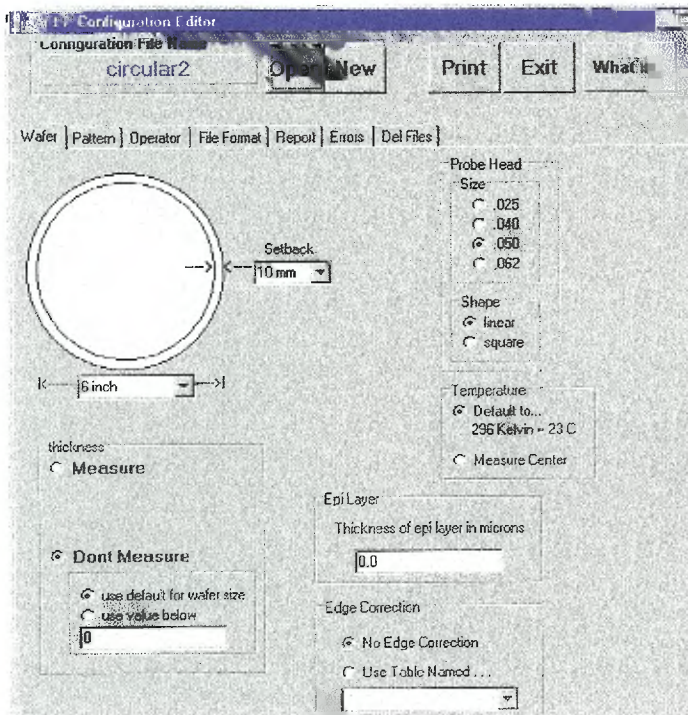
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AFPP... Automatic Four Point Probe

Shown below are the windows of the two main programs that control and operate the AFPP system. The left window is the configuration program. It is used by the process engineer to setup and configure what measurements are to be taken. The right window is the measurement program. It is used by the operator to take measurements and print reports.

These two programs are usually never run at the same time and thus would never be seen on the same screen. In a typical installation, the computer would automatically run the measurement program at startup (power on). It is usually configured so that the operator actually needs to know a password to end the measurement program and is thus prohibited using the computer for any purpose other than taking measurements and printing reports.

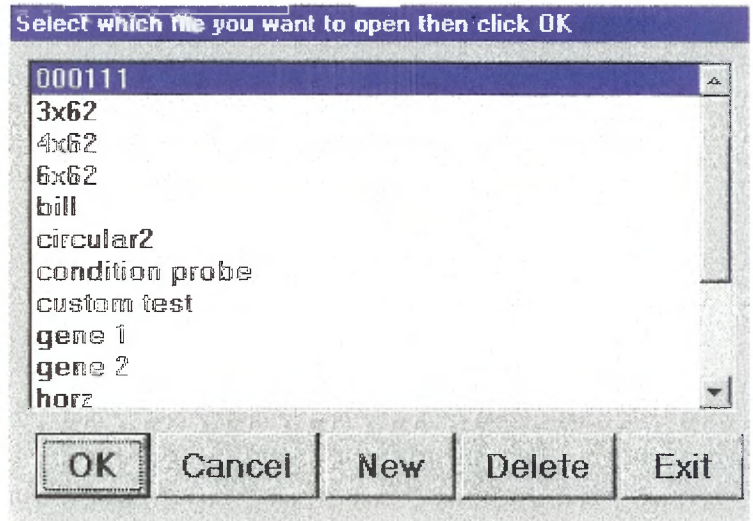
Notice the top-left corner of each window is used to display the Configuration File Name. This is the key field that ties these two programs together. The process engineer creates configuration files and defines the system parameters that go into it. The fab technician must choose one of these previously created configuration files to run the measurement program.



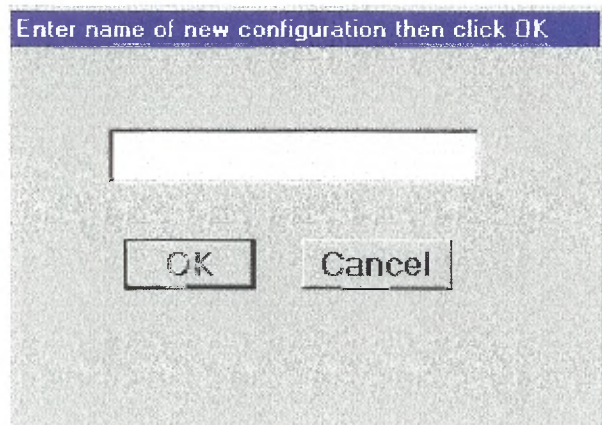
AFPP 500
6" Cir / 501c
Lays 10% / 44.5K

AFPP Configuration Program

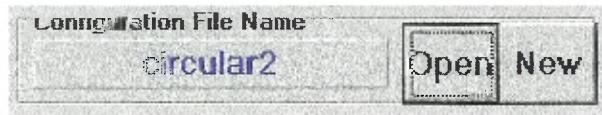
When the configuration program starts, it will pop open the dialog box (see right). This is the same box that will appear when the OPEN button is clicked on the main program window. Use the mouse to select the previously created configuration then click on OK..



To create a new configuration click the NEW button and the dialog box shown on the right will appear. Type in the new configuration name and click OK.



These same two dialog boxes will appear when you click on the OPEN or NEW buttons in the program's main window. Note that the currently selected configuration file name is always displayed.



Print Exit What Is...

The PRINT button just prints whatever is shown in the main window. The EXIT button will end the program. Clicking the What Is... button will cause question mark buttons to appear in various locations in the window. These are buttons that disappear after only 5 seconds. Clicking on one of these question mark targets will activate the help file program that may display useful information about the program.

The bottom part of the main window is a simulation of a tabbed notebook. Clicking on a topic tab will "open" the notebook to display the page containing that topic.

Wafer | Pattern | Operator | File Format | Report | Errors | Del Files

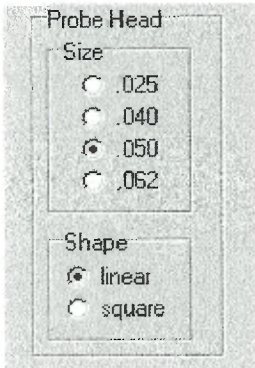
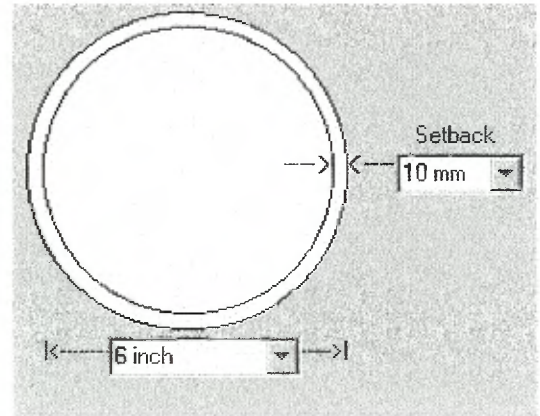
Configuring Wafer Parameters

The following fields are within the WAFER section of the simulated tabbed notebook.



Define the overall outside **DIAMETER** of the wafer to be tested. You may use the drop down dialog listbox to select standard sizes or use the keyboard to type in a number. Values of 8 or below are assumed to be in inches; else the value is in mm.

Setback value is always mm.



Define the configuration of the probe head.

Some computed values (on report) require a value for

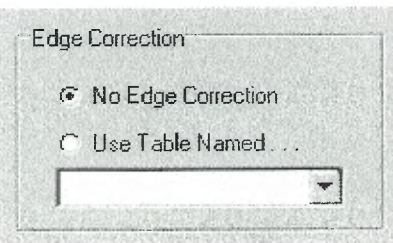
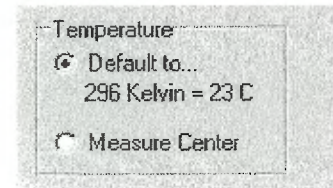
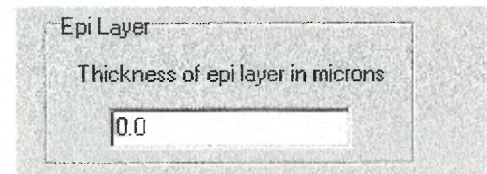
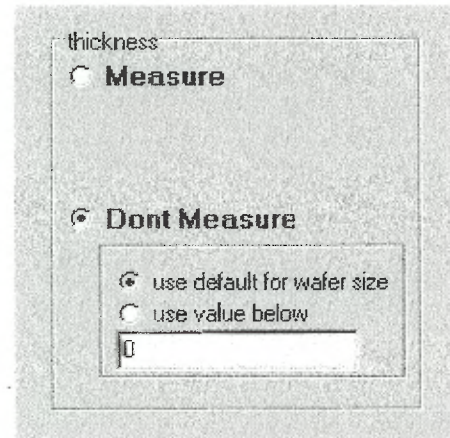
the thickness of the wafer...

...and/or..

the thickness of the Epi Layer...

...and/or...

...the temperature of the wafer...



Measurements taken near the edge of the wafer tend to have a slightly higher resistivity. A precompiled table can mathematically adjust for this phenomenon.

There is one table for each wafer type. The tables are built using the diagnostic utility to take multiple measurements from a "model" wafer. You need to have previously built this table and know its name in order to use this feature.

Configuring Measurement Patterns

The following fields are for the PATTERN page of the simulated tabbed notebook.



Pattern

- Center Only
- SEMI 5 Point
- SEMI 9 Point
- ASTM 5 Point
- ASTM 9 Point
- Radial Pattern
- Circular Pattern
- Grid
- N/P Test Only
- User defined (custom) pattern

Circles	Points
2	25

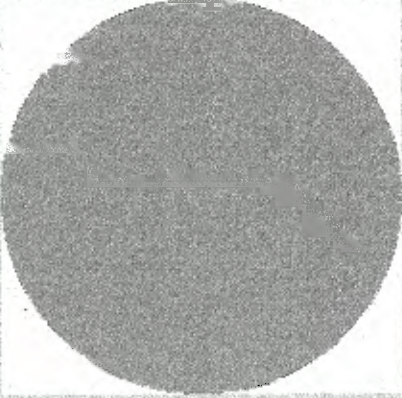
Choose the measurement pattern. If Radial, Circular or Grid patterns are selected, then additional parameter fields become visible.

If User defined (custom) pattern is selected, the box below will become visible.

Custom Pattern

Click on circle to create a measurement point.

Clear



Center

- one read at center
- two readings at center

System can be configured for one or two measurements at the center (second reading taken after rotating wafer 90 degrees)

N/P Test

- Test at Center
- No N/P Test

N/P test can be configured. This is optional and DOES take additional time.

A to D Samples

Take this many readings at each point

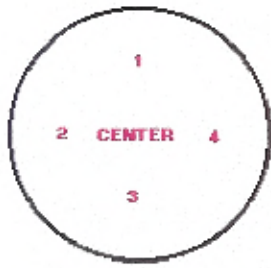
1

- Average ALL
- Exclude High/Low

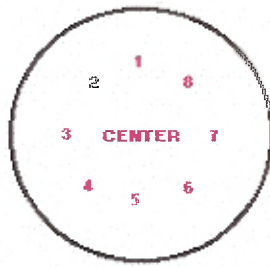
Sometimes more accurate measurements may be obtained by taking more analog sample readings at each measurement point. (For conditioning probe heads, set this number to zero!)

Warning! It takes the equipment longer (possible much longer) if significantly more samples are taken.

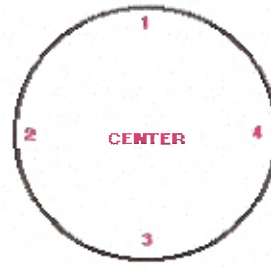
Graphics of Common Patterns



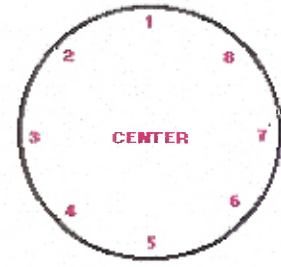
SEMI 5



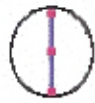
SEMI 9



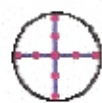
ASTM 5



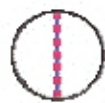
ASTM 9



1 Radial
1 pt/radius



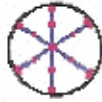
2 Radials
2 pts/radius



1 Radial
3 pts/radius



2 Radials
1 pt/radius



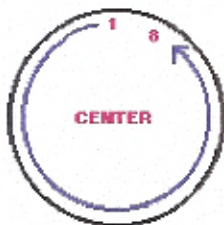
3 Radials
2 pts/radius



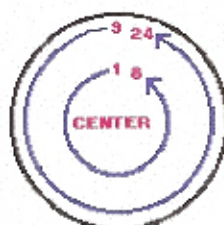
4 Radials
2 pts/radius

A radial is edge-to-edge (same as a diameter.)

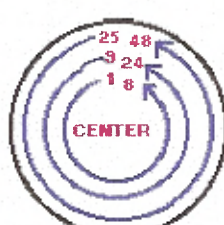
A 'radius' is a line starting at the center and going out. Points are specified as to the number per 'radius'.



1 Circle
(same as ASTM 9)



2 Circles



3 Circles

Each circle has 8 more points than previous circle.