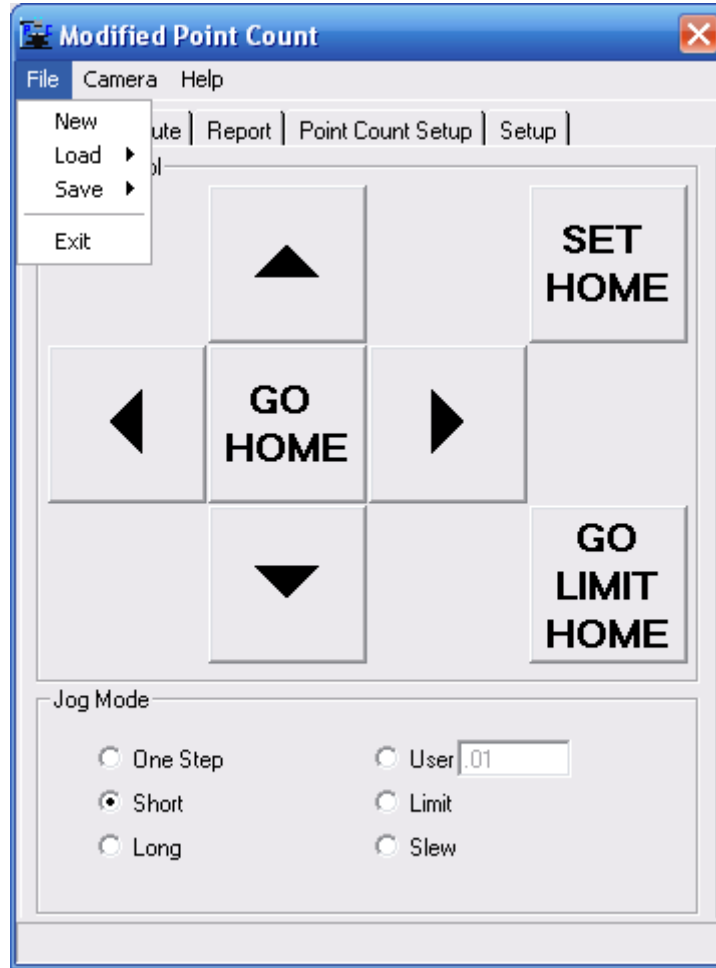
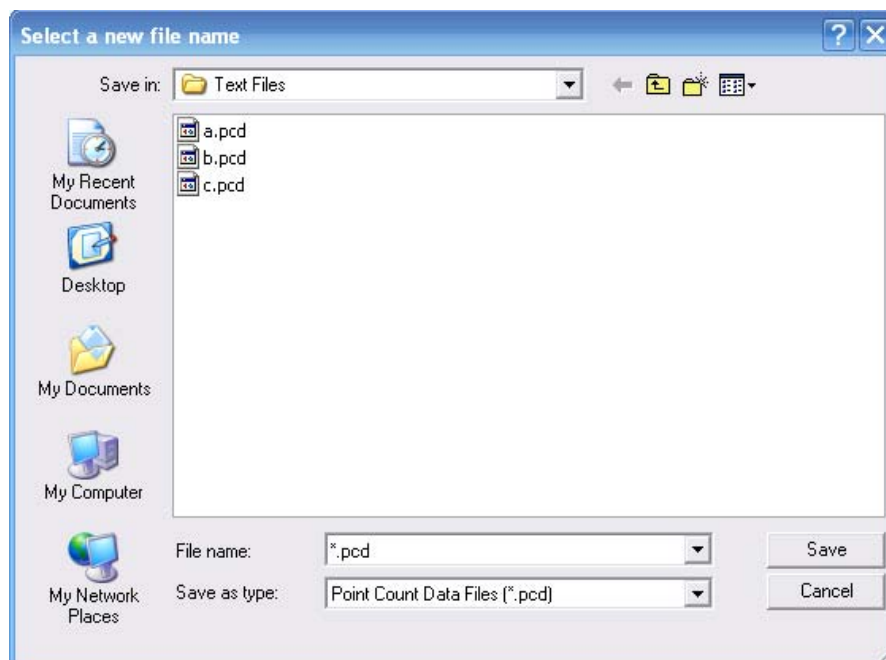


COMPUTERIZED MODIFIED POINT COUNT MANUAL

I. File Menu:



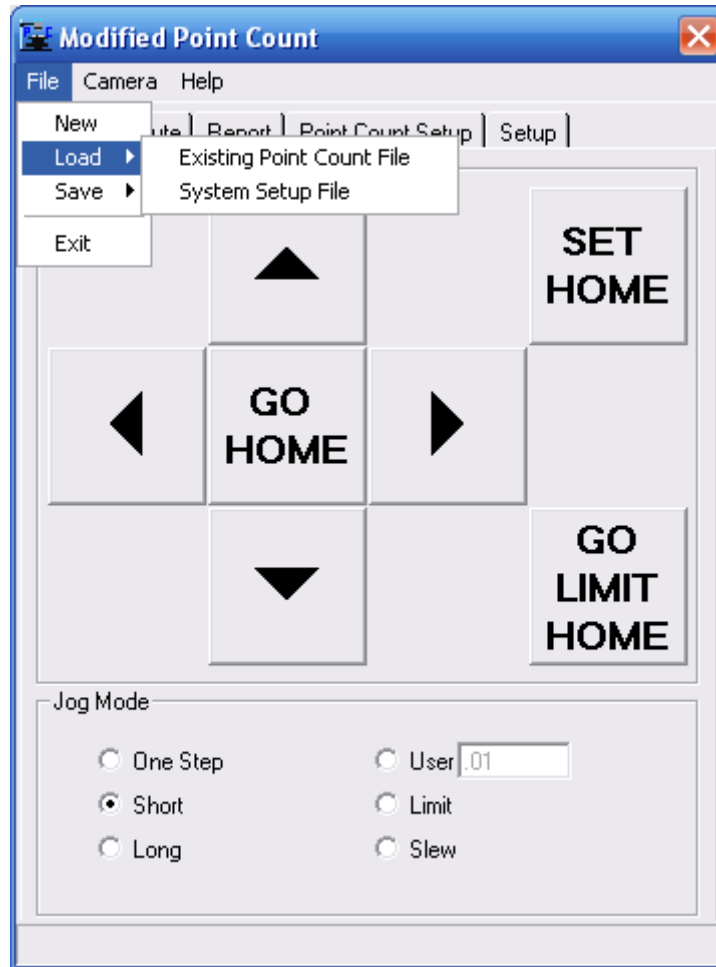
A. New: When New is clicked the following standard Windows® dialog box is displayed.



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Enter a name for the new file in the **File Name** box. You will automatically be re-directed to the Point Count Setup Tab to enter the relevant Point Count data. (see IV)

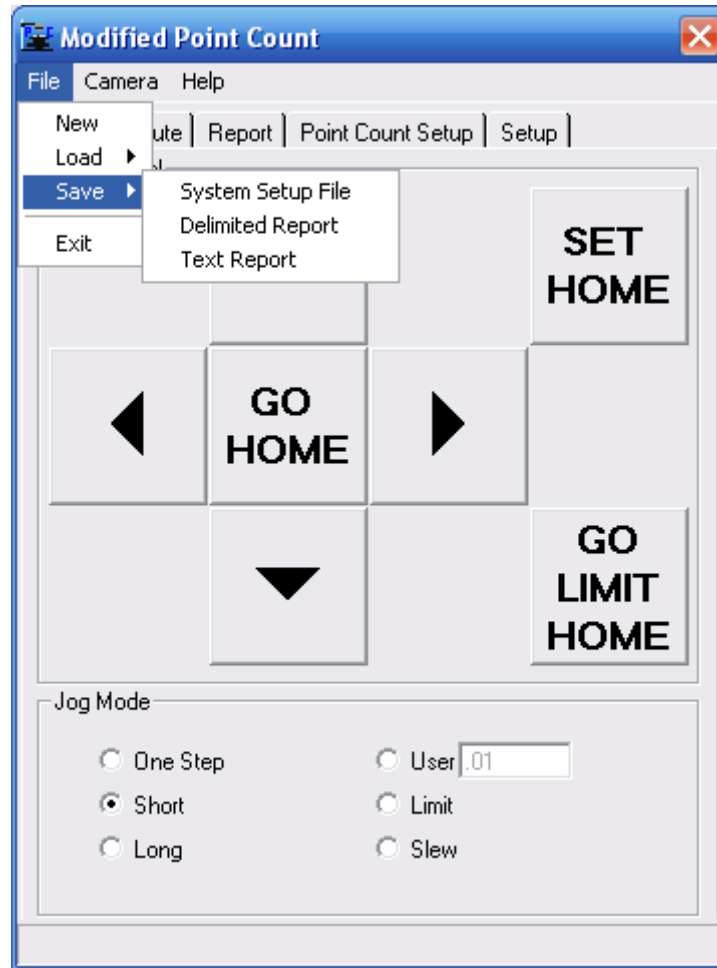
B. **Load**: When **Load** is clicked you are given a choice of loading an:



1. **Existing Point Count File**: Use this option to load an incomplete Point Count for continued execution, or to load a completed Point Count to produce a report. When this selection is clicked the standard Windows® **File Open** dialog box will be displayed. When the selected file is opened all relevant data, input and collected, is inserted into the **Execute**, **Report** and **Point Count Setup** Tabs.
2. **System Setup File**: Use this option to load a saved set of the Settings (see C2) that control the Point Count system. The program automatically saves (on shutdown), and loads (on startup), the systems settings under the name of "StartUp.cfg". When this selection is clicked a standard Windows® **File Open** dialog box will be displayed. This enables you to retrieve alternative System Setup Files that differ from the default loaded at startup.

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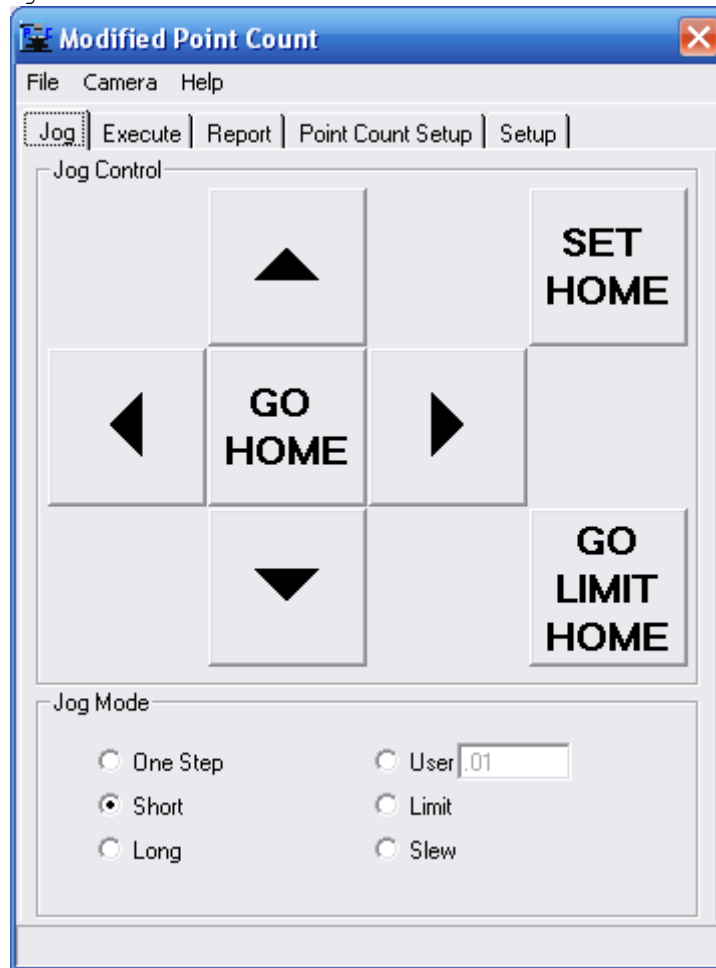
C. **Save**: When Save is clicked you are given the choice of saving a:



1. **System Setup File**: Use this option to save a set of the Settings (see B2) that control the Point Count system. The program automatically saves (on shutdown), and loads (on startup), the systems settings under the name of StartUp.cfg. When this selection is clicked a standard Windows® **File Save** dialog box will be displayed. This enables you to store alternative System Setup Files that differ from the default loaded at startup.
3. **Delimited Report**: Use this option to save a quote and comma delimited Point Count report that can be imported into other programs (i.e. Microsoft Excel®). When this selection is clicked the standard Windows® **File Save** dialog box will be displayed. A name is then entered for the file and it is then saved with the file extension ".csv".
4. **Text Report**: Use this option to save a Point Count report as a standard text file that can be loaded by all word processing programs and then printed. When this selection is clicked the standard Windows® **File Save** dialog box will be displayed. A name is then entered for the file and it is then saved with the file extension ".txt".

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II. **Jog Tab:** The controls on this tab enable you to manually control the position of the stage.



- A. **Jog Control** Frame: All the following descriptions of the buttons functions assume that the user has accepted the standard Stage Metric for axis polarity (see ????)
1. **▲**: Moves the stage North, away from the user.
 2. **SET HOME**: Sets the current position as Home (X=0, Y=0).
 3. **◀**: Moves the stage West, to the User's left.
 4. **GO HOME**: Sends the stage Home X=0, Y=0).
 5. **▶**: Moves the stage East, to the User's right.
 6. **▼**: Moves the stage South, toward the User.
 7. **GO LIMIT HOME**: Moves the stage to the Limit Home position, with the lower left hand corner of the stage under the microscope.
- B. **Jog Mode** Frame: The selections in this frame determine how the stage will move when one of the **Jog Buttons** (▲◀▶▼) are clicked. All the following descriptions of the radio buttons functions assume that the user has accepted the standard the standard 10,160 steps/inch Stage Metric.
1. **One Step**: The stage moves one step (2.5 microns/0.000098 inches) for each click of the button.
 2. **Short**: The stage makes a short move (2.54mm/0.10 inch) for each click of the button.
 3. **Long**: The stage makes a long move (25.5mm/1.0 inch) for each click of the button.
 4. **User**: The stage makes a move length determined by the value in the text box next to it for each click of the button. If

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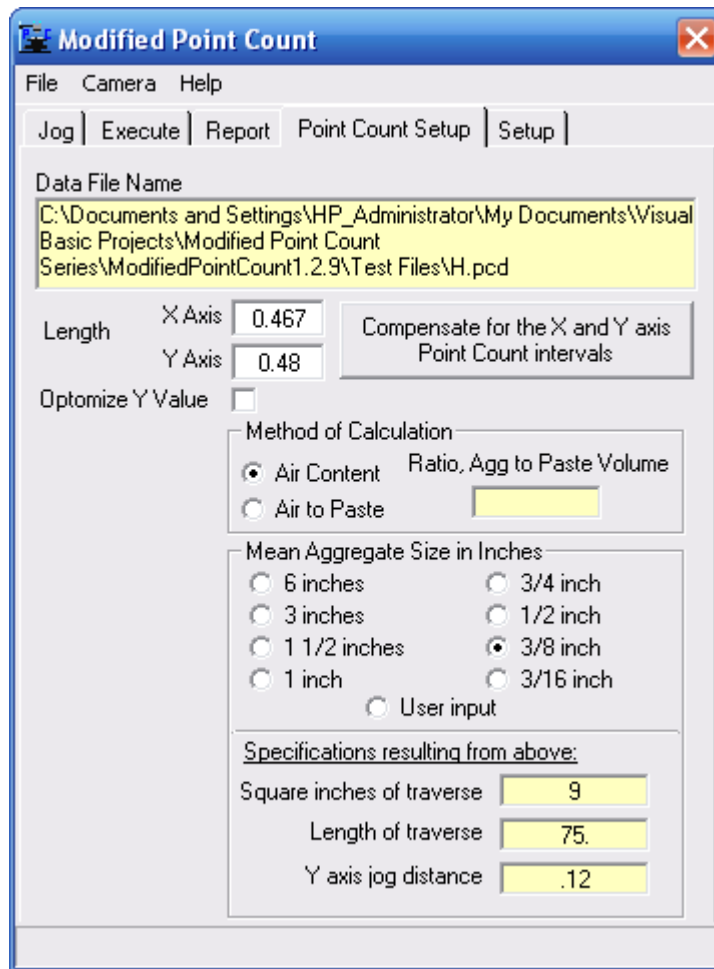
7. **SAND:** Collects Fine Aggregate
 8. **STONE:** Collects Coarse Aggregate
- IV. **Calculated Values** Tab: Displays the computed values and produced by the current Point Count File. This data is updated continuously.

The screenshot shows a software window titled "Modified Point Count" with a menu bar (File, Camera, Help) and a tabbed interface. The "Calculated Values" tab is active, displaying a list of calculated parameters in yellow text boxes. At the bottom, there is a checkbox for "Ignore empty points in calculations" which is checked, and a "Re-calculate" button.

Parameter	Value
Paste Percent	5.1
Fine Aggregate Volume	73.64
Coarse Aggregate Volume	12.73
Air Content	9.184
Void Frequency	1.285
Paste Content	5.102
Paste to Air Ratio	0.56
Average Cord Length	0.067
Specific Surface	60.0
Spacing Factor	0.00993

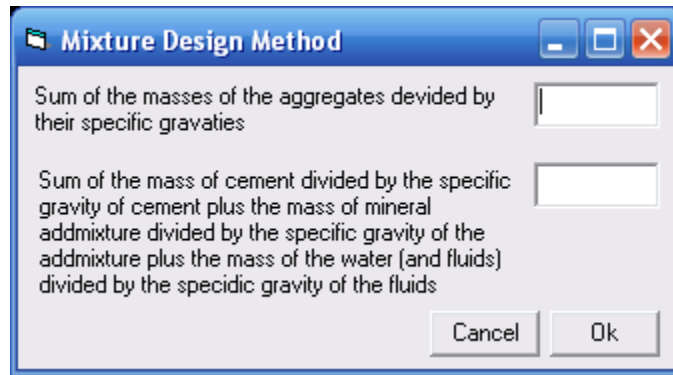
- A. **Ignore empty Points in calculations** Checkbox: when checked empty, or ignored points, are not figured into the calculations.
 - B. **Recalculate** Button: Forces a re-calculation of the calculated values. This button is only necessary if you have loaded a Point Count file and then decided to either count or not count empty points.
- V. **Point Count Setup** Tab: The data that is required for creating or modifying a Point Count file is entered here. All text boxes (labels) in yellow display either calculated data or data that was previously entered, they cannot be altered.

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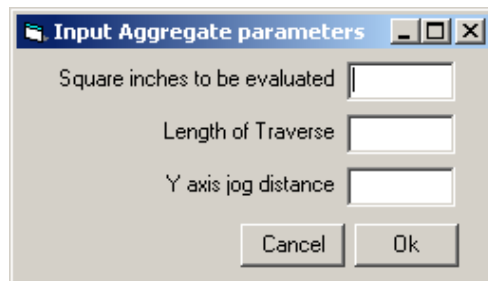
- A. **Current File:** This label was either created when **New** was selected from the **File** menu or loaded when **Load\Existing Point Count File** was selected.
- B. **X Sample Length:** The length, in inches, of the rectangular area to be scanned not the length of the sample. Decimals may be used where appropriate.
- C. **Y Sample Length:** The width, in inches, of the rectangular area to be scanned not the width of the sample. Decimals may be used where appropriate.
- D. **Compensate for the X and Y axis Point Count Intervals:** REQUIRED - Adjust the values for the X Axis Length and Y Axis Length so that number of point stops do not exceed the samples size.
- D. **Optimize Y Value:** If you feel the size of your sample will permit an entire Point Count to be performed select this option. Now instead of using the minimum allowable distance between scans the scans will be spread to cover the determined by 'X' and 'Y' from above.
- F. **Method of Calculation** Frame: The standard method of **Air Content** has been pre-selected. If you select **Air to Paste** the following dialog box will appear. The data to be entered is self explanatory.

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1. **Cancel**: Cancels any entries and restores the method to **Air Content**.
2. **OK**: Accepts the entries and computes values where necessary.

G. **Mean Aggregate Size in Inches** Frame: If any one of these are selected will force the value in the **Aggregate** frame to **Counting**. Selecting **User input** will cause the following dialog box to appear:



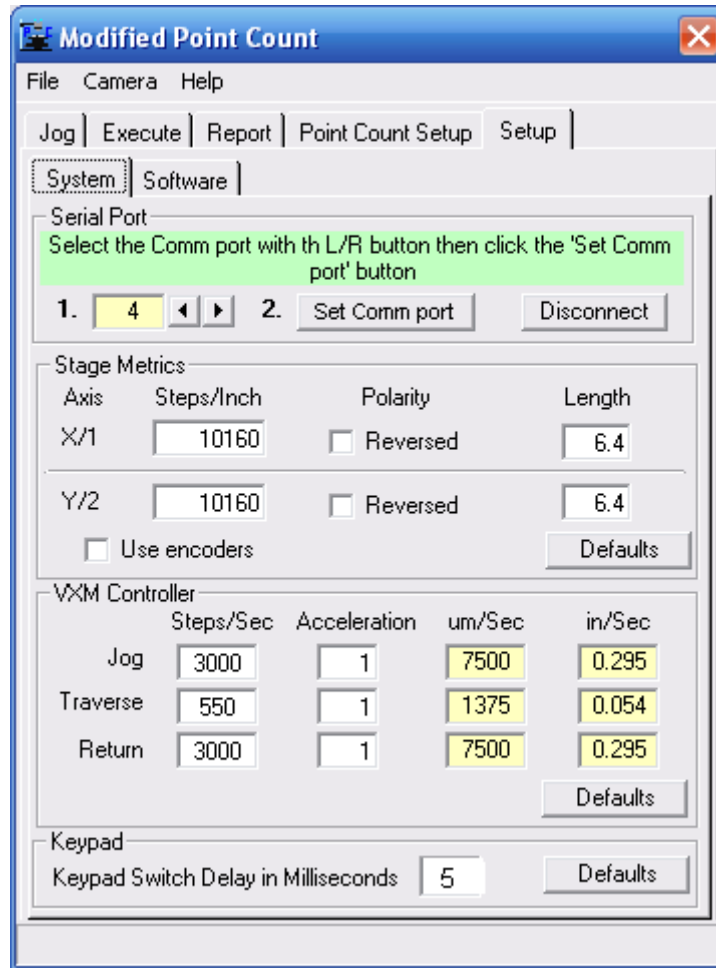
1. **Square inches to be evaluated**: This is the number of square inches for a complete Point Count, not the current scanning session.
2. **Length of Traverse**: This is the length, in inches, needed for a complete Point Count, not the current scanning session.
3. **Y-Axis Jog Distance**: The minimum allowable distance between consecutive scans.
4. **Cancel**: Cancels any entries and restores the **Aggregate** size to the default.
5. **OK**: Accepts the entries.

H. **Specifications resulting from above**: Displays the underlying data resolution from the Aggregate size selected above.

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VI. **Setup** Tab: Controls the basic operations and parameters of the Linear Point Count system.

A. **System** Tab



1. **Serial Port** Frame: Controls the parameters of the serial port communicating with the VXM Controller
 - a. **◀▶**: Use the Left-Right arrows to select a serial communications port from 1 to 255.
 - b. **Set Comm. Port** Button: Once a port has been selected click this button to initialize the port. This port will now be automatically initialized on startup.
 - c. **Disconnect/Connect** Button: If you want to use the optional joystick you need to disconnect the controller from the computer.
 - d. **Show Comport Buffers (Diagnostic Only)** Check Box: If this box is checked **Input Output Buffer** Window is attached to the bottom of the main window. This is for diagnostic purposes only.
2. **Stage Metrics** Frame: Defines the resolution, polarity and size of the stage.
 - a. **Steps/Inch X**: The number of steps the stepping motor need to make to travel one inch on the X axis. The default is 10160.

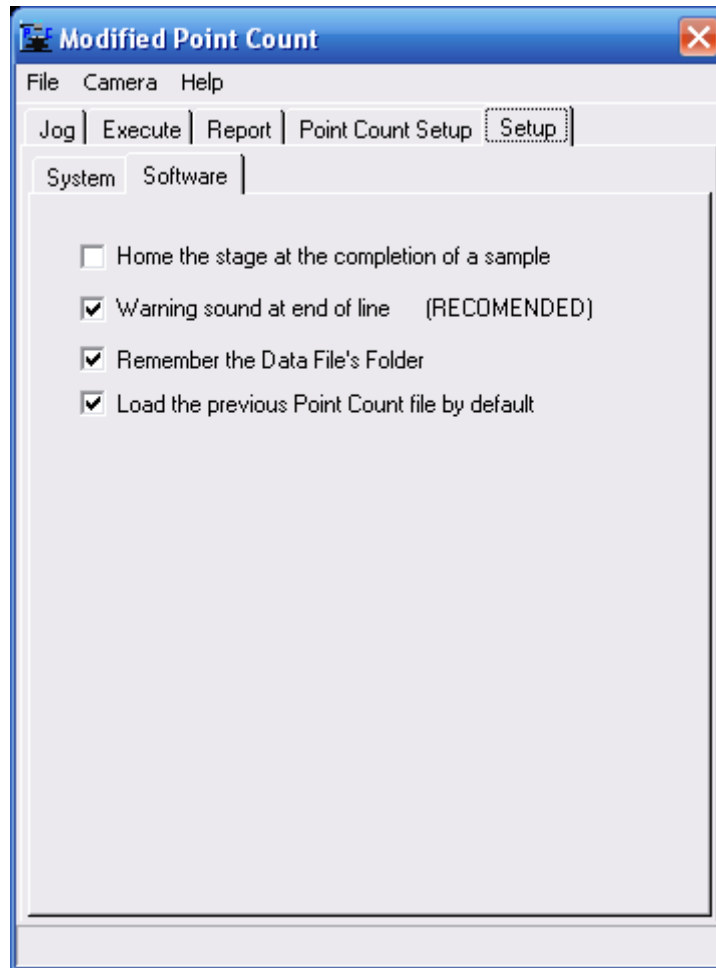
$$\text{StepsPerInch} = \frac{1}{1\text{mm pitch} / 400 \text{ steps per revolution} * 0.0393700787}$$

- b. **Steps/Inch Y**: The number of steps the stepping motor need to make to travel one inch on the X axis. The default is 10160

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- c. **Polarity X Reversed** Check Box: Checking this box reverses the motor direction logic. The default is unchecked. In this state the **Jog Buttons** (◀▶) accurately depict the East and West direction of stage travel and the Point Count is started from the left side of the specimen.
 - d. **Polarity Y Reversed** Check Box: Checking this box reverses the motor direction logic. The default is unchecked. In this state the **Jog Buttons** (▲▼) accurately depict the North and South direction of stage travel and the Point Count is started from the bottom of the stage
 - e. **Length X**: The total travel length on the X axis, which is normally 6 inches.
 - f. **Length Y**: The total travel length on the Y axis, which is normally 6 inches.
 - g. **Use Encoders** Check Box: This system can get it's distance data from either counting steps or reading the encoders. It is recommended that this box remains checked.
 - h. **Defaults** Button: Will re-set the Stage metrics To their defaults.
3. **VXM Controller** Frame: Controls the speed and acceleration limits.
- a. **Jog Speed**: The number of steps per second the stage travels while jogging, returning or homing. Acceptable values range from 1 to 6,000 steps per second. A value of 3000 or less is recommended.
 - b. **Jog Acceleration**: The acceleration factor for the stage while jogging. The values range from 1 to 127.
 - c. **Execute Speed**: The number of steps per second the stage travels during a Point Count. Acceptable values range from 1 to 6,000 steps per second, but lower values are recommended for accuracy. A value between 50 and 500 is comfortable. Experiment to find the best speed for yourself.
 - d. **Execute Acceleration**: The acceleration factor for the stage while jogging. The values range from 1 to 127. The lower the acceleration the greater the theoretical accuracy. A setting of 1 is recommended but you can experiment to find a higher value you are comfortable with.
 - e. **Return Speed**: The number of steps per second the stage travels while Retracing. The values range from 1 to 6,000 steps per second.
 - f. **Return Acceleration**: The acceleration factor for the stage while Retracing. The values range from 1 to 127.
 - g. **Defaults** Button: Will re-set the VXM Controller to it's defaults.
4. **Keypad Switch Delay Frame**:
- a. **Keypad Switch Delay in Milliseconds**: A delay value used to de-bounce the keypad switches. Any value, in milliseconds, may be inserted but a value of around 5 milliseconds is appropriate.
 - b. **Defaults** Button: Will re-set the Keypad Switch Delay to it's default 5 milliseconds.

B. Software Tab:



1. Home the stage at the completion of a sample Checkbox: Check this box if you wish to return to the home position after each sample is completed.
2. Warning sound at the end of line Checkbox: **RECOMMENDED**. You will be warned that you are entering the **LAST** point of the line. This is recommended because the last point **MUST** not be entered twice. If it does happen the system may skip the Y jog and repeat the line.
3. Remember the Data File's Folder checkbox: Check this box if you wish the program to automatically return to the same folder for saving and retrieving data files.
4. Load the previous Point Count file by default Checkbox: Check this box if you would like to re-load a current file for completion at a later date.

VII. Executing a Point Count

- A. Load or create a Modified Point Count file:
 1. If you wish to continue with an existing Point Count select **Load** then **Existing Point Count File**, from the **File** menu. You can then select an existing file from the File Dialog Box.
 2. If you wish to start a new Point Count file select **New** from the **File** menu. You can then enter a new name in the File Dialog Box.
- B. Mount your specimen on the stage, then using the **Jog** keys place the lower left hand corner, of the area to be scanned, under the microscope's cross hair.
- C. To begin a traverse you must either create a new Point Count file (see IA) or load an existing one (see IB1). When either option is completed you are immediately sent to the **Point Count Setup** Tab.

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1. If it is a new file you will have to enter all the required data
 2. If it is an existing file you will only be able to edit the **X Sample Length** and **Y Sample Length** fields.
 3. If new data has been entered, or if the existing data has been changed, the **Compensate for the X and Y axis Point Count intervals** Button MUST be clicked.
- D. Select the **Execute** Tab to begin the traverse.
- E. Click **START** to initialize the traverse. If the Traverse is complete according to specifications you will be notified and the Traverse will not start. If any of the data is incomplete you will be sent to the **Point Count Setup** Tab to make corrections. If all the data is correct The **START** Button will be de-activated (grayed out) and the Point Count Keypad will be activated. The **Stop** Key is *ONLY* active at the beginning of a Traverse line.
- F. You will be prompted to enter a Point (press the Key that corresponds to the object under the crosshair), the stage will then move to the next point.
- G. If an Air Void is Intercepted traveling between points click the **INTERCEPT** button
- H. Continue entering points at each stop until the last point of the line of traverse is reached.
- I. The prompt at the last point will change indicating that you are at the last point and that entering it will cause the stage to retrace to the beginning completed line.
- J. The prompt will now change to indicate that you must wait until all motion has stopped before pressing the **Ok** button to move up to the next line
- K. At this point any of three things can happen:
1. If the traverse is complete the stage will either travel to the home position if that option has been selected, or remain in place.
 2. The traverse can be canceled by clicking the **Stop** Key.
 3. The traverse can be resumed by going to step **F**.