BOARD STRETCHER™
LUMBER OPTIMIZING PROGRAM

SOFTWARE TRAINING MANUAL

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MiTek® Learning Channel

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Board Stretcher
Overview

The optimizing program, called **Board Stretcher™,** resides on a computer in the plant production office.

> **NOTE:** In addition to the production office computer, *Board Stretcher* Software can also reside on the saw computer and multiple PCs with a shared database.

The purpose of this program is to import the following file types:
- Roof truss part listings (.OMN or .CUT) file from the truss design software
- Wall panel file (.MIZ),
- Universal part file (.XML) **(Recommended)**
- Australia file (.MME)

Once imported these parts are then placed onto stock boards using an optimizing process that is chosen by the user.

The software will then output a board (.MDB, .MIZ or .XML) file for the **MiserII, OmniMiser, MiniMiser** or **MatchPoint Blade** to cut.

The user of the *Board Stretcher* software is responsible for defining a library of material that lists all available stock that is available for the saw to select from. This list should contain stock that's available in the bunk feeder and magazines as well as stock that is available for the operator to load manually.

This list is called the **Lumber Yard** and it contains **Grade, Size,** and **Length** data about each type of lumber available as well as the **Source** – (**manually loaded, magazine fed**, or **bunk fed)**

> **NOTE:** This information was written for *Board Stretcher* version 5.0 and may vary slightly from other versions

Board Stretcher
Overview (cont)

How It Works

The heart of the *Board Stretcher* program is the ability to combine the Parts List and the Lumber List for the efficient use of material. Board Stretcher will then create a board listing with boards that contain all the parts for that job for every grade and size.

The optimization algorithm is as follows:
- The optimization process will sort all the parts from the imported selection into: **Board Grade, Board Size.** Part Lengths are sorted in descending order.

- It selects the longest part first and the first length of board with the same grade and size and place the part.

- It then takes two independent paths to placing additional parts on the board.
    - The first selects the part with the best matching angle to the preceding part.
    - The second selects the longest part that will fit on the remainder.

- After part placement is completed using both of these methods, the board that has the least amount of waste is chosen, and the other is discarded.

- This process is repeated for all board lengths within a grade and size to attempt placing the parts on. The placement methods are the same, but after the parts have been placed on each length, the board that has the least percentage of scrap is chosen and the others discarded.

- This process is repeated for additional boards until all parts are placed.

Board Stretcher
Information and Terminology

Information:
- When changing units of measurement, the same unit must be chosen in the *BLADE Saw* software before optimizing the job.
- Imperial measurements (English) are given using 3 pair of numbers. **12-06-08** means 12 feet, 6 inches, and 8/16 inches (12' 6-1/2"). Metric measurements are given in whole millimeters (mm).
- Lumber grade name format must be entered following guidelines agreed upon at your facility. It must EXACTLY match the design file's grade name for the lumber, or the system will not recognize it as an existing lumber.
- The **WoodRunner** ™ lumber retrieval *system* is now called **Ranger RS™**

The information here may help when determining length entered for stock lengths.
This scenario is based on cutting (2) 8' boards from a 16' stock length.
- Adding material to the Lumber Yard is generally entered by specified length not actual length.
- Bundle material actual length is generally ¼" to ⅜" longer than specified length.
- The Blade cannot cut (2) 8' boards from a stock length of 16' because the kerf is not accounted for.
- Entering the 16' length as 16-00-04 (actual measured length) allows the extra material for the kerf and (2) 8' boards can now be cut from a stock length.

Terminology:
- **Kerf -** the nominal cut thickness removed by the saw blade.
- **Part -** A piece of a board, cut to the exact size and shape required for the job
- **Board -** A specific piece of lumber with specific dimensions required by the saw to cut out specific parts
- **Lumber** A group of boards or a non-specific board; no consideration given to the final size or shape

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Board Stretcher Menus
File

This section will introduce the user to all drop-down menus.
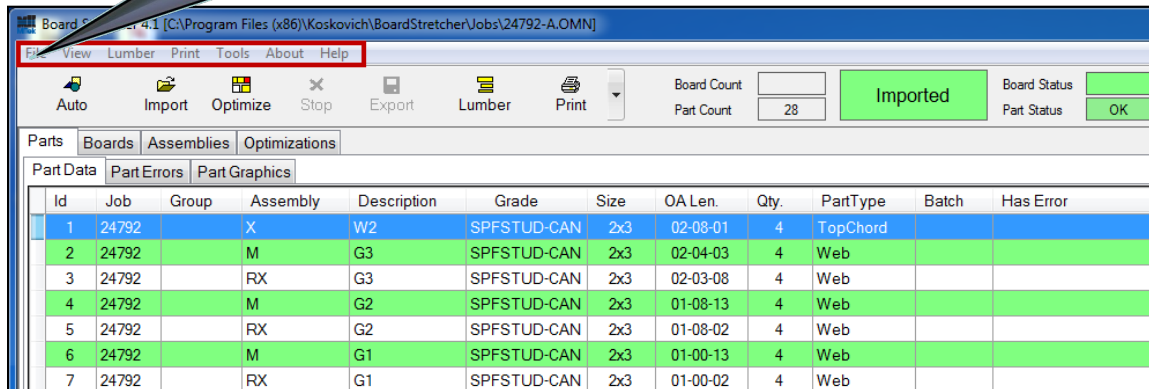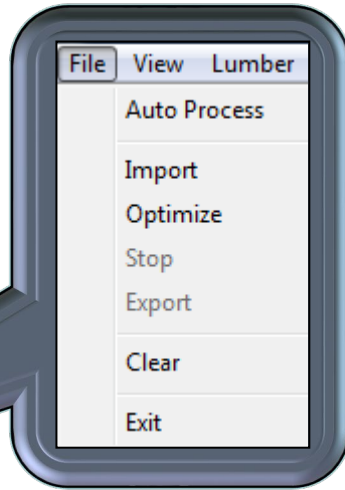
Auto Process - Allows you to quickly import a job and have the program optimize it according to your present preferences and then sends the output to the saw in a directory that you have set.
Completes the import, optimize, and export steps all with one click. (Also on the Task Bar as Auto)

Import - Opens a file browse window for the user to import a file/files into the program. Hold the CTRL button on the keyboard to select more than one file which will combine the files. (Also on the Task Bar as Import)

Optimize - Will place all of the parts from the file/files onto boards to give you the best optimization of your lumber. (Also on the Task Bar as Optimize)

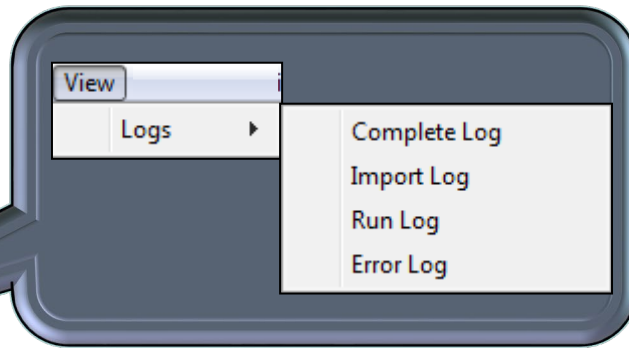**Stop -** Once optimization has begun, it can be stopped using this menu choice. (Also on the Task Bar as Stop)

Export - This selection sends the optimized job to the saw. (Also on the Task Bar as Export)

Clear - Removes the active job from "active" status. Clears all data in the primary tabs except the Optimizations tab.

Exit – Closes the program

Board Stretcher Menus
View

Complete Log - This selection allows you to view all logged data.

Import Log - This selection allows you to view any import-related errors or information.

Run Log - This selection allows you to view any changes made to options and records entries when something has been completed such as import, optimize, or export.
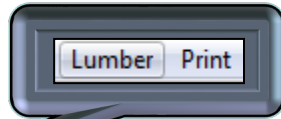
Error Log - This selection allows you to view any errors that happened during the optimization process.

Board Stretcher Menus
Lumber and Print

Lumber (Also on Task Bar)
This is formatted differently than other entries and allows you to view and modify your Lumber Yard, or the lumber that you make available to the saw. *Board Stretcher* uses this information to optimize your lumber usage.
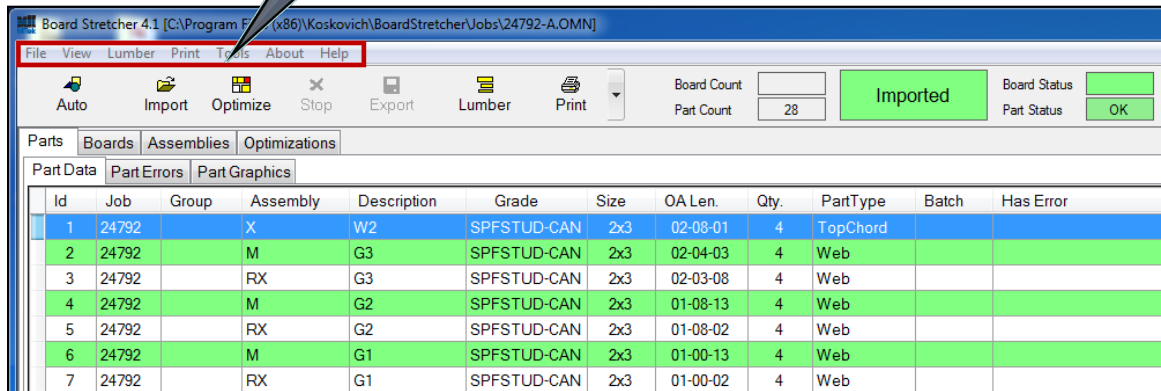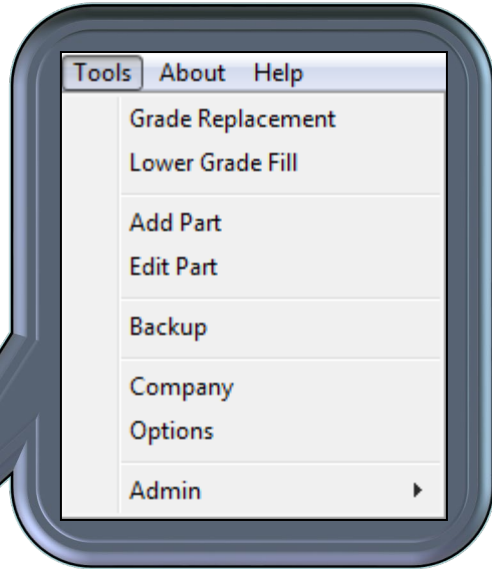
When Lumber is clicked, either from the Lumber Menu or from the Task Bar, a second screen appears on top of the primary screen.

Print Menu (Also on Task Bar)
There are different reports included in *Board Stretcher* that can assist in managing lumber used. All three reports can be printed from the **Print** menu. Two of them can also be printed using the **Print** button on the Task Bar.

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Board Stretcher Menus
Tools

Grade Replacement - Changes lumber grades in the import file to a different grade, either for all lumber in a grade, or for specific widths in a grade.

Lower Grade Fill - Place lower grade material onto higher grade material if there is room left on the end of a board.

Add Part – Choose a generic part and customize it from scratch to add a part to the job that wasn't in the job file.

Edit Part – Change the design, quantity, grade, etc. of a part already in the job file.

Backup – Upon clicking Backup, the config.mdb file will save to a user specified directory.

Company – Allows you to fill in your company information so it can be used on reports
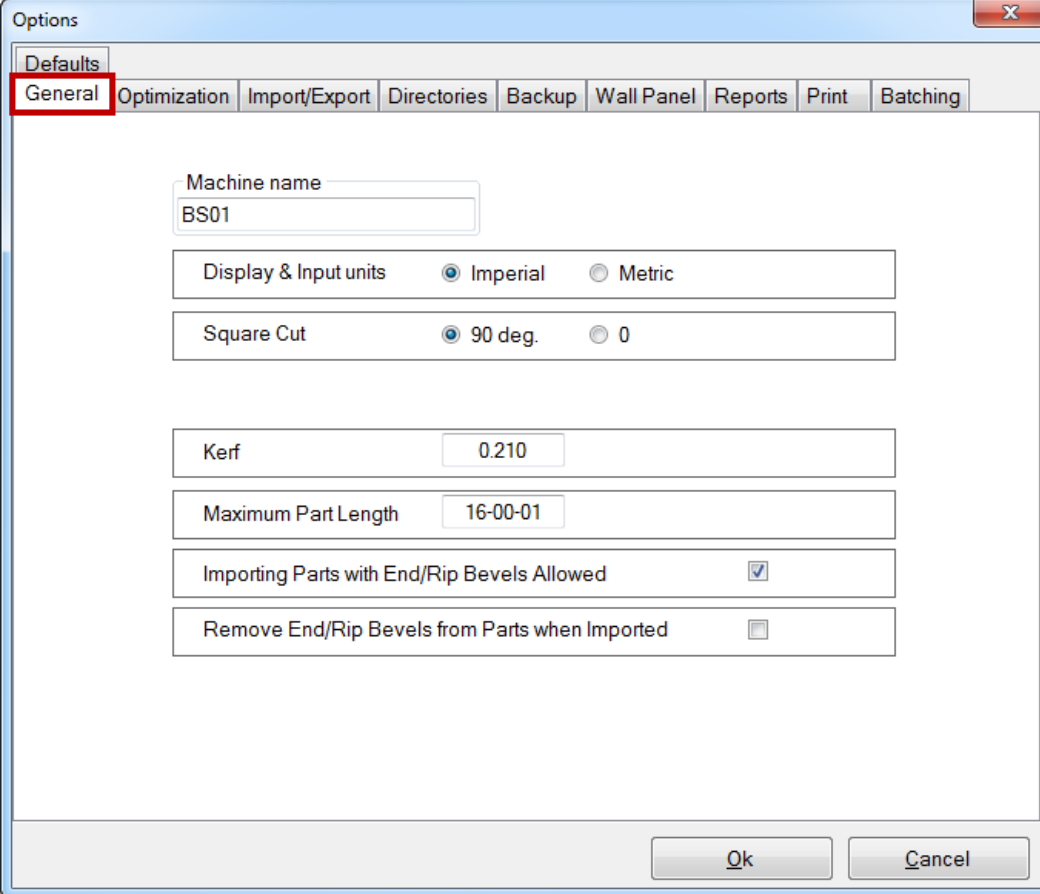
Options – See the next step for details

Admin - All of the standard configuration items an operator should ever need can be set in Admin.

NOTE: Admin settings should not be changed without consulting with MiTek first. The correct setting were entered by a MiTek representative at installation.

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Tools > Options
General Tab

Machine Name – Choose the name the *Board Stretcher* application uses in log entries.

Display and Input Units - Choose imperial or metric measuring units

Square Cut – Set the angle for a square cut

Kerf – Set the blade thickness

Maximum Part Length – Set the maximum part length for a single part

Importing Parts with End/Rip Bevels allowed – If checked *Board Stretcher* allows the importing of bevels without showing an error

Remove End/Rip Bevels from Parts when Imported - If checked *Board Stretcher* will remove bevels on parts for saws not capable of processing bevels.

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Tools > Options
Optimization Tab

Lower Grade Fill – Allows the software to automatically take parts calling for lower grade material and place it on a higher grade material if there is room on the end of a board..

Replace Grades - Allows you to replace lumber grades in the import file to a different grade, either for all lumber in a grade, or for specific widths in a grade.
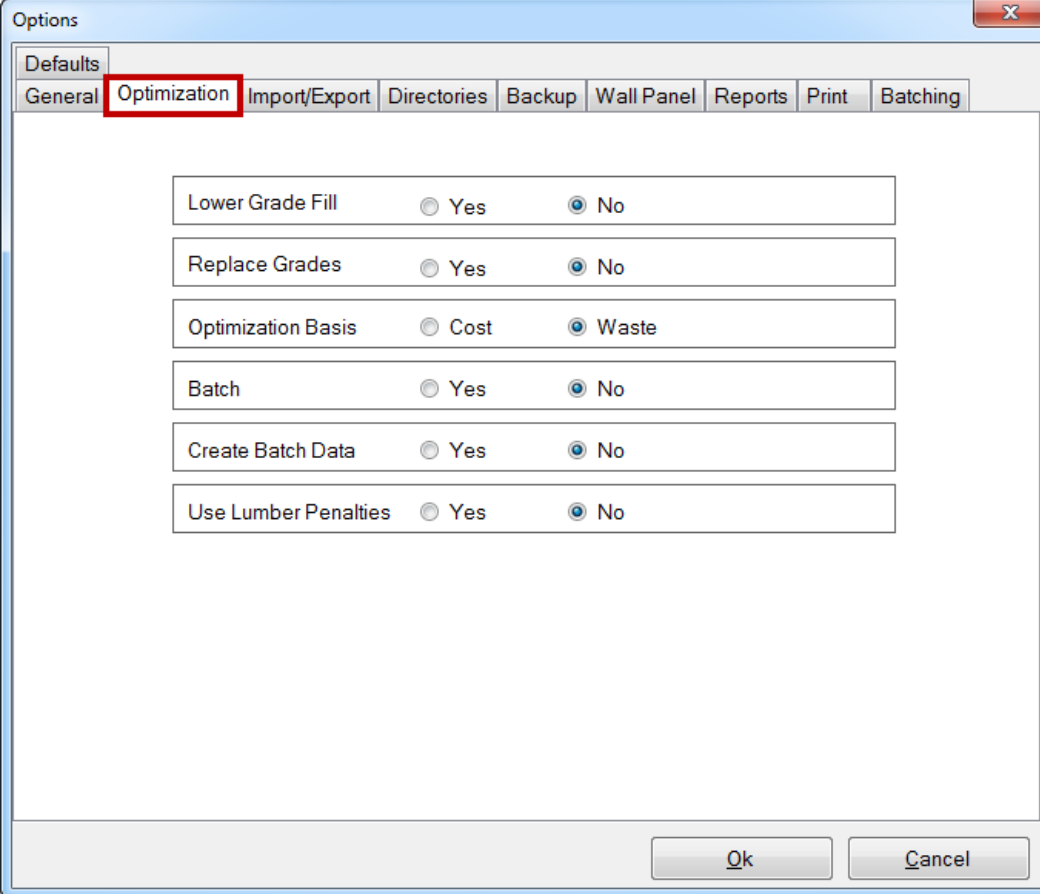
Optimization Basis - Allows you to select either cost or waste as the basis for the optimization. If waste is selected, it will optimize to give the minimum waste. If cost is selected, it will optimize to give the minimum cost, based on costs entered into the Lumber Yard data.

Batch - It allows the output of the saw to group parts together within a job to simplify sorting at the saw. The downside, however, is that this will negatively affect the optimization.

Create Batch Data - Allows the operator to create multiple batches for files that do not already contain batches. Setup for batching criteria are located on the Batching tab.

Use Lumber Penalties - Enables/disables whether or not the lumber penalties are used for the optimization process (based on either cost or waste). If this selection is enabled, it will display the default lumber penalties that will be applied when adding new boards to the Lumber Yard.

Tools > Options
Import/Export Tab
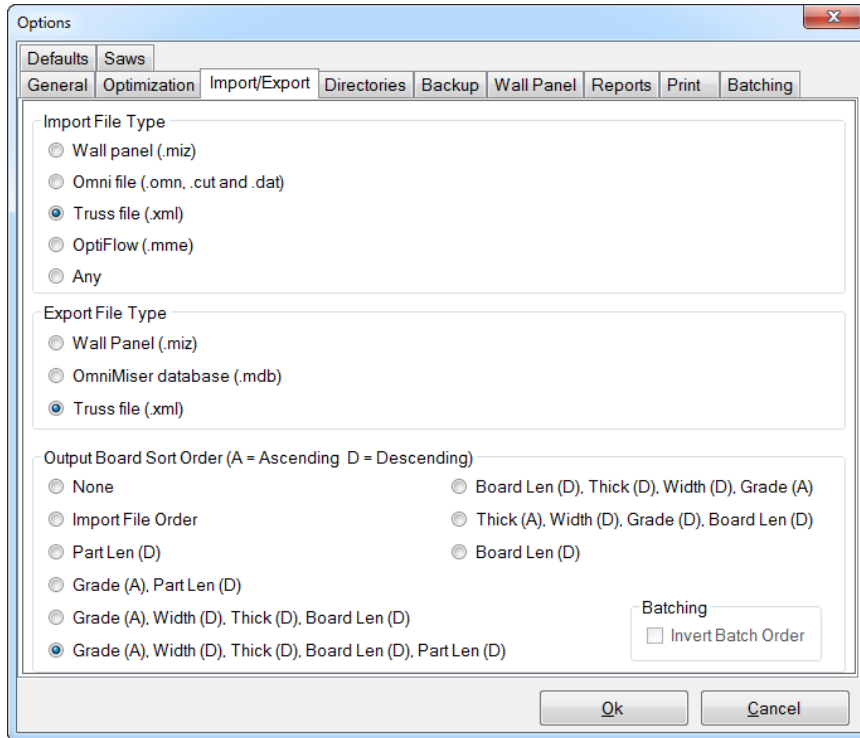
Import File Type – Choose the type of file format that you will be using when importing files from your design program to Board Stretcher.

Export File Type - Choose what type of file format you will be sending to the saw from the **Board Stretcher** program. The Miser II saw and MatchPoint Blade will only accept .xml files.

Output Board Sort Order - Choose the output of the boards. This option controls the order of the optimized boards.

NOTE: This does not affect how the boards are optimization, only the order the saw requires boards.

NOTE: Output Board Sort Order (A=Ascending D=Descending)

Tools > Options
Directories
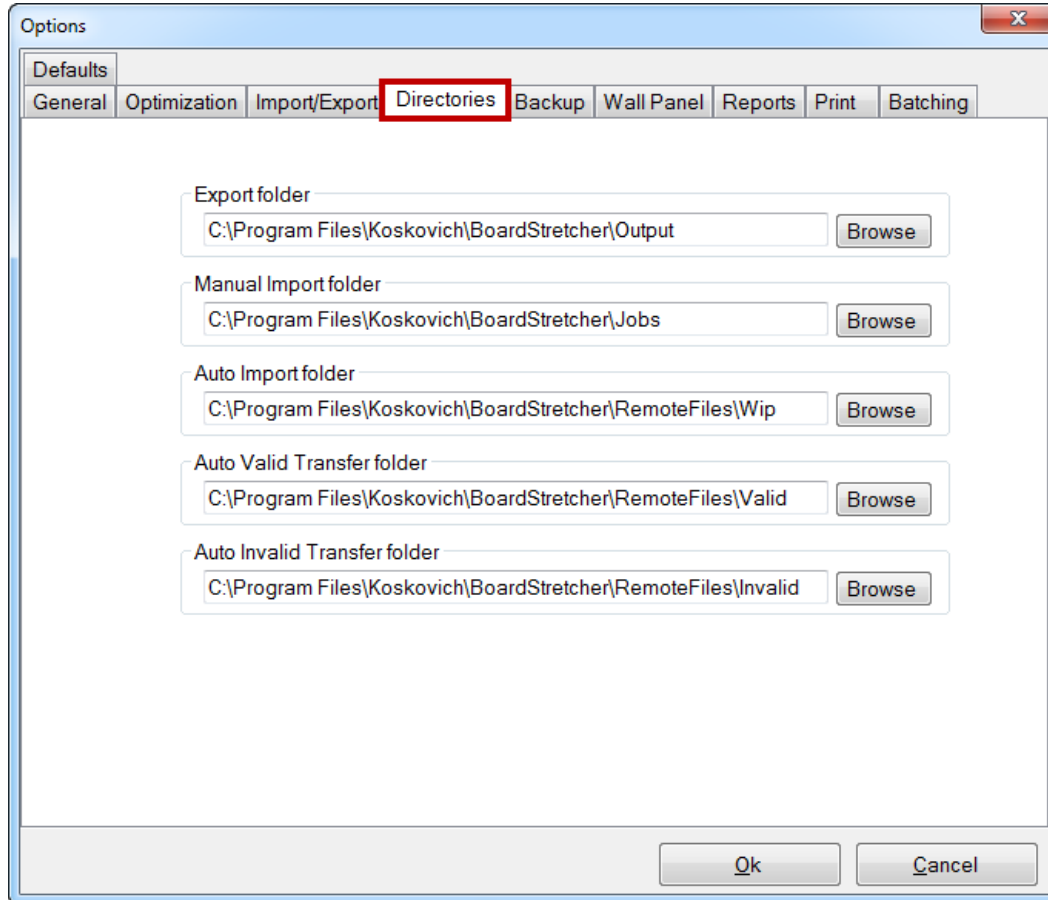
Export Folder – The path where the optimized job file will be saved at all times. This is the folder from which the saw will retrieve jobs.

Manual Import Folder - The default path that will be selected when importing the file without optimization

Auto Import Folder - The path that the software watches for files to import, optimize, and export automatically. This folder must be kept empty, as every file that exists in the directory will be read in as a job file.

Auto Valid Transfer Folder - The path where the un-optimized job files are moved when the Auto Import (import, optimize, and export) has completed successfully. This is **NOT** where the optimized files are moved.

Auto Invalid Transfer Folder - The path where the un-optimized job files are moved when the Auto Import (import, optimize, and export) was unsuccessful. This is typically caused by lumber required not matching the Lumber Yard, or parts being too short or long.

Tools > Options
Backup and Wall Panel
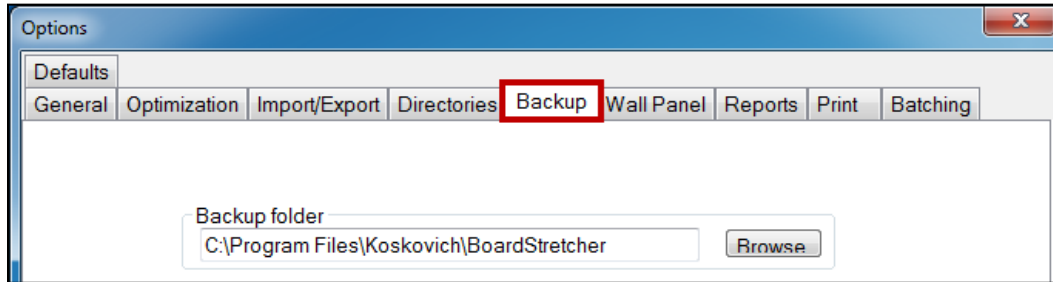
Backup Folder – Where the backup files are stored.
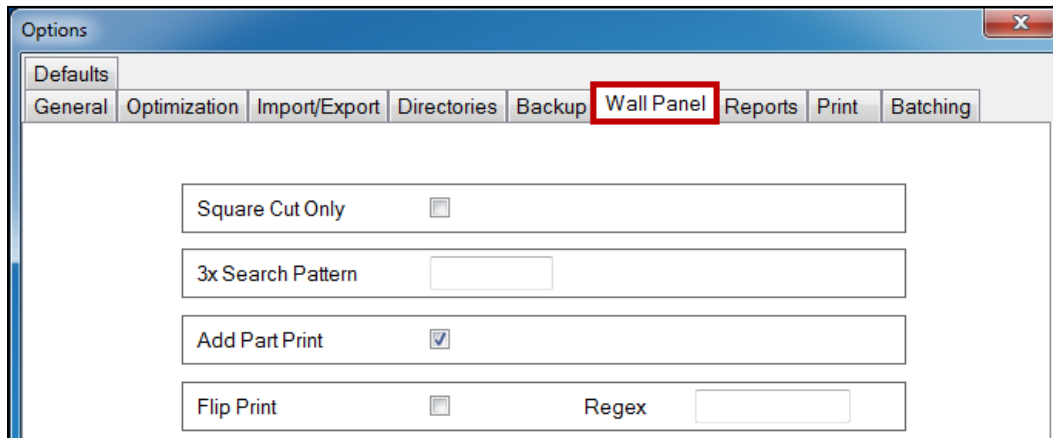
Square Cut Only - This option will be set if your saw only has the ability to cut square angles or force all cuts square

3x Search Pattern - If you have the ability to cut 3x material on your saw, you will enter a text string that occurs in the board grade which identifies the board as a 3x (instead of the default 2x).

Add Part Print - Adds part description to what is already being printed on the board.

Flip Print - Adjusts the location of printing on the top and bottom board so the printing can be easily seen. **Available only for .MIZ files.**

Regex - An advanced method of batching. Contact MiTek if there is a need to use the Regex feature.

Tools > Options
Reports
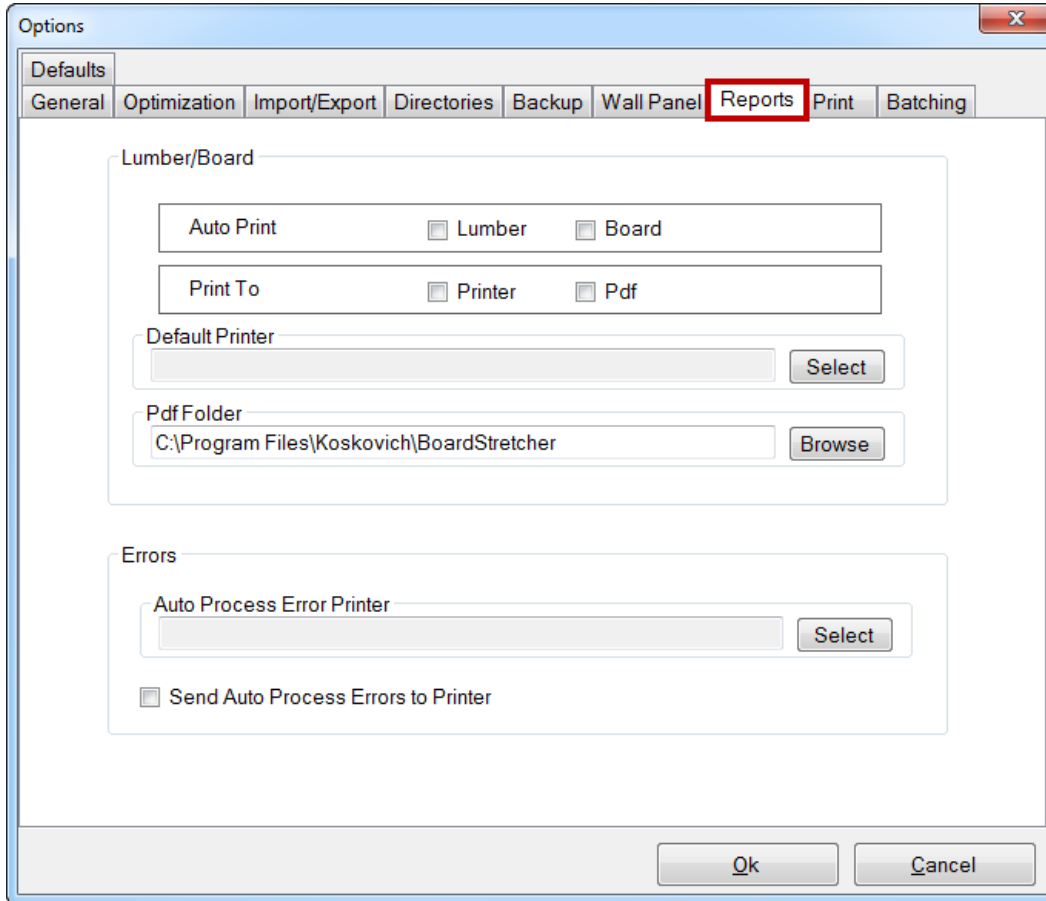
Auto Print – As soon as the job is exported the pick list or board list for the job will be printed.

Print To - You can either print to your default printer or to a pdf file.

Default Printer – Select the default printer

PDF Folder - This is the path that pdf documents are created in.

Errors - For Auto Process jobs, errors for each job will print to the designated printer as the job attempts to run.

Tools > Options
Print

Printers – Select the applicable checkboxes for the current board printing system.

Truss Print Justify - Select **Leading Edge, Trailing Edge** or **Center** to determine where the text will print on each part. Trailing Edge is most commonly used. This is the location of the printed info which is closest to the stacker.

Print Selection –
- **Default** prints the following information: Name, description, and quantity of like parts.
- **Custom** must be selected to print anything other than the default information.

Custom Print Fields –
- **Column -** The Column is the number of digits, from the left, of a given field.
- **Length -** The Length is how many digits including and following the column selected in a given field.
  - If the Description option is selected, for example 1135-W2-787. If Column is set to 6 and Length is set to 2, W2 will be printed.
- **Arrows –** Move a selected field up and down the list.

- **Add –** Click this button to add a blank field for a new entry.

- **Remove –** Remove a selected field.

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Tools > Options

Custom Print Fields

Custom Print Fields – Specifies which information will print on boards and the number of characters being printed.

Field – On Parts > Part Data Tabs.

Custom Print Fields			
Field	Column	Length	Text
JobName	4	4	
Assembly	1	4	
Description	1	4	
Quantity	1	3	

Parts	Boards	Assemblies	Optimizations					
Part Data	Part Errors	Part Graphics						
Id	Job	Group	Assembly	Description	Grade	Size	OA Len.	Qty.	PartType

Column – The character where the print information begins. In this example, the 4th character from the left.

Length – The number of characters to be printed. In this example, 4.

Based on the Custom Print Fields for JobName, 2748 would print on the board. Also, following the same parameters, the information for Assembly, Description and Quantity would be included

NOTE: When setting up a new printer on a MatchPoint™ BLADE, refer to the troubleshooting documentation available online at www.MiTek-US.com for the correct settings

Parts	Boards	Assem
Part Data	Part Errors	
Id	Job	
1	1512748-12T	
2	1512748-12T	
4	1512748-12T	
8	1512748-12T	
9	1512748-12T	
10	1512748-12T	
16	1512748-12T	
17	1512748-12T	

Tools > Options
Custom Print Fields (cont)

NOTE: Custom fields print in the order they are listed. This can be changed using the up/down arrows..
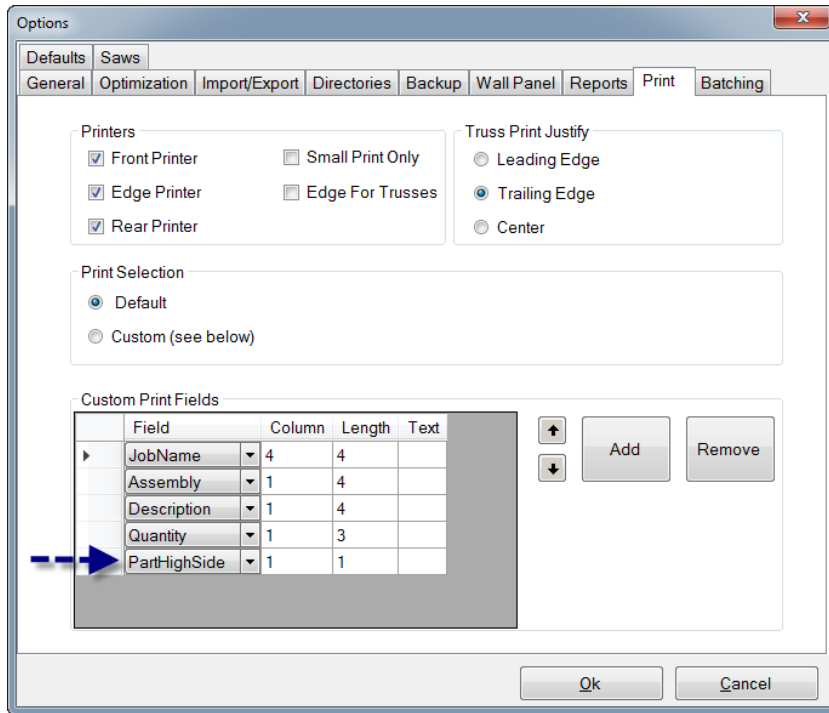
Print Which End is UP

Board Stretcher software has a new option to help distinguish the direction a part should point during assembly of a truss.

If the software has been updated to version 5.0.3.0 or later, the saw's printer can add an arrow to the part.

The arrow always points to the end of the part that should be higher (closer to the top of the truss) than the other end. If the part is perfectly horizontal, no arrow prints.

This feature works on any MiTek linear saw using Board Stretcher software.

From **Tools > Options**, select **PartHighSide** in the **Custom Print Fields**.

Will only work on 3 dimensional file types. XML output format required (MDB for Miser I)

Tools > Options
Custom Print Fields (cont)

Custom Print Fields

Field	Column
None	1

None
Truss
Assembly
JobName
Group
Quantity
Description
Grade
StockLength
StockWidth
CenterLineLength
OverAllLength
OverAllLengthFraction
Side
AOSide
AssemblyStagingGroup
QtyPerAssy
QtyPerJob
FileName
Text
PartHighSide

- **OverAllLengthFraction** – Single and double quotes cannot be added to dimensions. Choosing this field will make the measurement of 8' 6-3/16" print as 102 3/16.

- **Side -** Prints an L or R to indicate left side or right side of the truss so it can be sorted on separate carts or piles. Often used for long trusses. This field divides truss at the peak to determine L and R.

- **AOSide – (Assembly Order Side)** Same as *Side*, but truss is divided at the center of its span to determine L and R.

- **Text -** allows you to add any text you want to the print. Select the field *Text* and type a short text string into the Text column. That text will print directly before the next custom field. You could add "qty" tp print directly before the numerical quantity. Or you could print your company name at the end of every truss.

- **PartHighSide -** Prints an arrow (< or >) pointing toward the top of the truss; the end of the part that is higher when assembled. If the part is perfectly horizontal in the truss, no arrow prints. At this time, this feature is only available for the BLADE saw.

Tools > Options
Batching
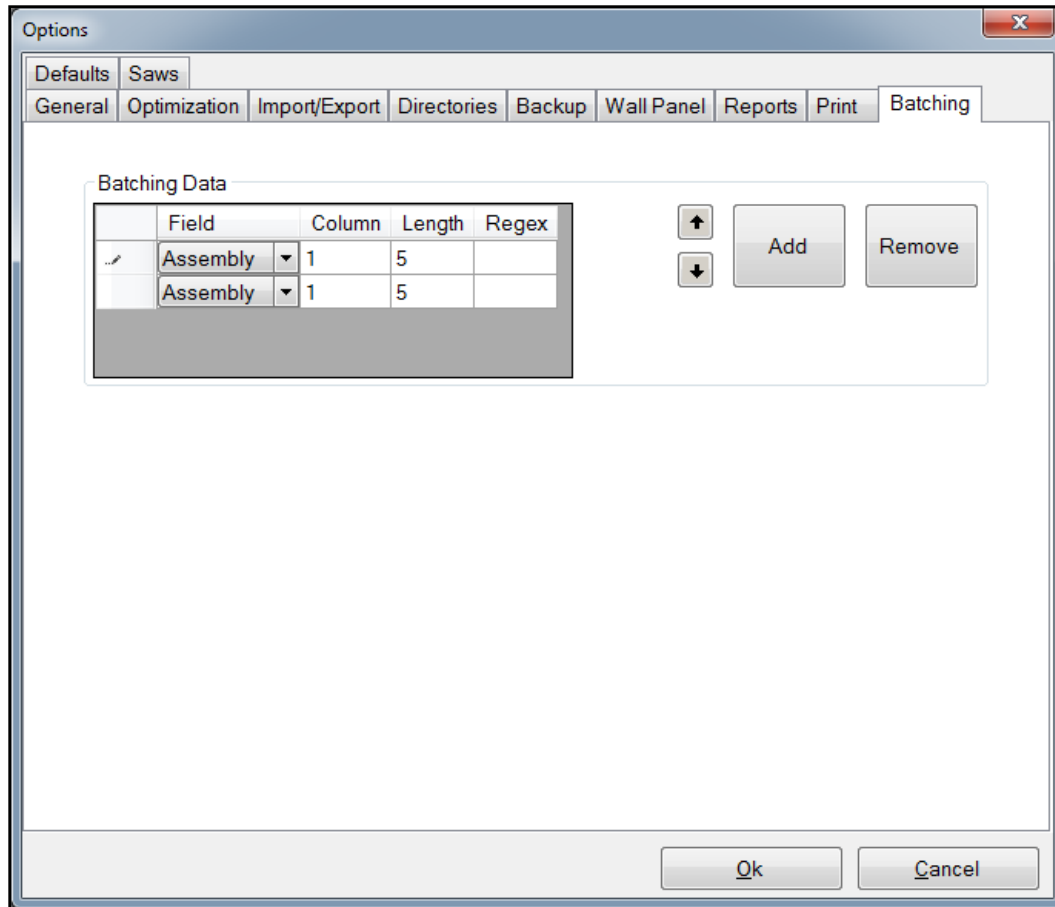
Batching Data –

- **Column -** The Column specifies the position of the first digit in a given field.

- **Length -** The Length specifies how many digits following the column (and including the column itself) are selected in a given field.

- **Arrows –** Move a selected field up and down the list.

- **Add –** Click this button to add a blank field for a new entry.

- **Remove –** Remove a selected field.

Tools > Options
Batching (cont)

Batching information

- Has a significant negative impact on efficiency
- Cuts only in a specific order of information entered in the Batching Data section
- In trusses the Field column will be set to Assembly or Truss.
- In trusses, cuts all of the parts for one truss then moves to the next truss.
- Arrow buttons move the highlighted item up or down
- Clicking the Add button adds an additional row.
- Clicking the Remove button removes the highlighted row.
- Remainder board, after one truss, will not be used by next truss but rather ejected as scrap or cut into applicable remainders.

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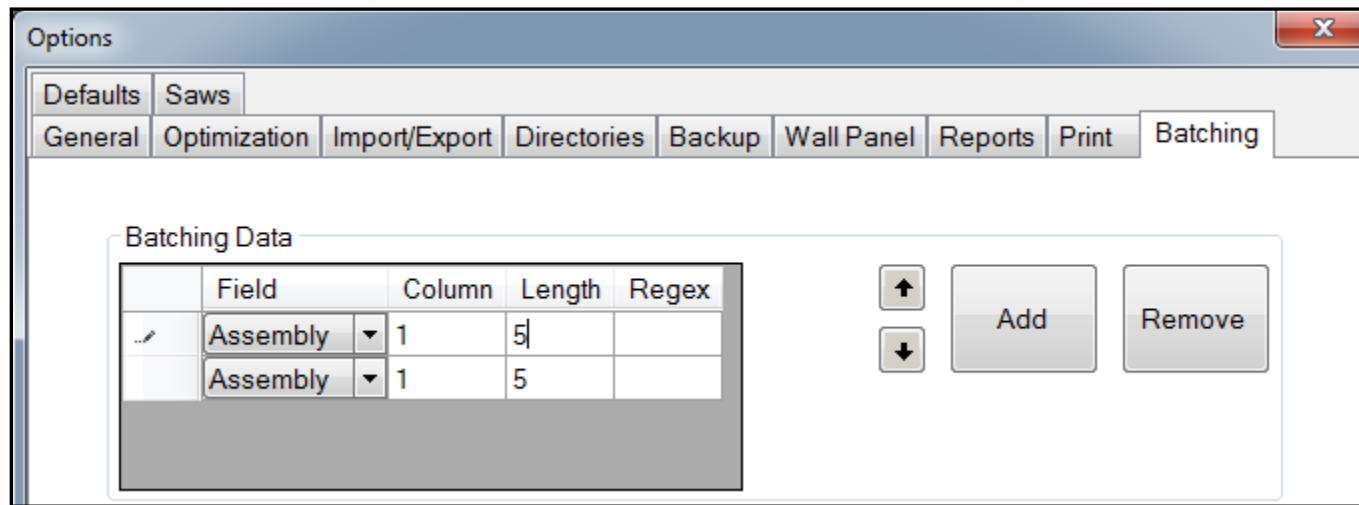
Tools > Options
Saw

Saws:

- A list of available saws

Input Box:

- The listed saw can be added, removed or renamed.

Board Stretcher Menus (cont)
About and Help

About – Displays version number and Copyright information

Help – Access to Help Files and Technical Support for contact and reporting problems

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Board Stretcher Menus
Task Bar
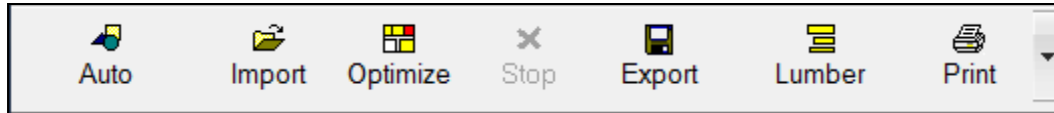
Auto – Allows you to quickly import a job and have the program optimize it according to your present preferences . Then sends the output to the saw in a directory that you have set. Completes the import, optimize, and export steps all with one click. Also found under File > Auto Process

Import – Opens a file browse window for the user to import a file into the program. Hold the CTRL button on the keyboard to select more than one file. Also found under File > Import. Multiple selections will be combined.

Optimize - Will place all of the parts from the current import selection. onto boards to give you the best optimization of your lumber. Also found under File > Optimize

Stop - Once optimization has begun, it can be stopped using this icon. Becomes active after the Optimization button has been clicked. Also found under File > Stop
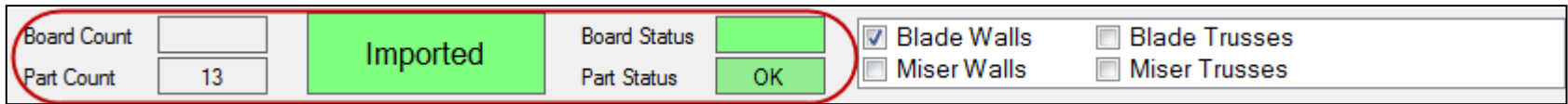
Export - This selection sends the optimized job to the saw. Also found under File > Export

Lumber - This Is the lumber that you make available to the saw. *Board Stretcher* uses this information to optimize your lumber usage. When Lumber is clicked a second screen appears on top of the primary screen. May also accessed from the Lumber tab

Print - There are different reports included in *Board Stretcher* that can assist in managing lumber used. All three reports can be printed from the Print menu. Two of them can also be printed using the Print button on the Task Bar. May also accessed from the Print tab

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Board Stretcher Menus
Status Bar

Board Count – Displays the number of boards used in optimization.

Part Count - Displays the number of parts that are in the imported selection that have been placed on boards

Current Job Status (green) - Displays the current state of the optimization process.
Status options include:
- Imported
- Imported (with errors)
- Optimizing
- Optimized
- Exported
- Error

Board Status - Displays the status of the optimized boards. It can either be OK, Warning, or Error.

Part Status - Displays the status of the imported parts. It can either be OK, Warning, or Error.

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Board Stretcher Menus
Saw Selection

Board Count		Imported	Board Status		☑ Blade Walls ☐ Blade Trusses
Part Count	13		Part Status	OK	☐ Miser Walls ☐ Miser Trusses

Board Stretcher allows you to have multiple configurations saved. Here you select the one you are using.

These are referred to as "saw" but the difference can be as minor as a different lumber selection in the lumber yard or a print setting for an alternate scenario based on needs.

This selection does not impact auto mode. Auto uses its individually configured auto import folders and does not need the SAW to be selected to operate on its respective configuration.

NOTE: The only two times you need to have the correct SAW selected is if you are manually importing a job to optimize or if you are making a configuration setting change that is SAW specific.

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Board Stretcher Menus
Primary and Secondary Tabs

Parts	Boards	Assemblies	Optimizations
Part Data	Part Errors	Part Graphics	
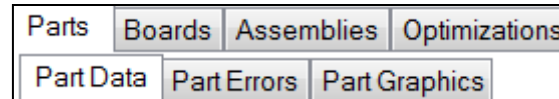
The primary tabs near the top of the Main Screen provide different options

The secondary tabs change, depending on which primary tab is selected.

Parts - Displays the parts in the active import selection (by list and by graphic).

Boards - Displays type, quantity, and waste information for the active import selection It includes lumber needed from inventory as well as each board. Data is displayed in a list and graphically

Assemblies - Graphically displays the assembled truss and each board required IF the imported file contains truss or panel information. If not, this tab remains blank

Optimizations - Lists each time the active import selection has been optimized, allowing a comparison to choose the scenario with the least waste.

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Board Stretcher Operation
Importing a Job - Manually

To manually Import a job:

1. From the **Task Bar**, click **Import.**

Task Bar

The user can import any of the following file types
- **.OMN or .CUT –** generated by the truss design software
- **.MIZ -** generated by the wall panel design software
- **.MME –** Used in Australia
- **.XML -** could contain wall or truss information

2. Select the next job from the list

NOTE: If any problems occur with the import file, the optimizing software will automatically try to correct the problem as well as notify the user of the problem.

Job List

Name	Date modified	Type
540-1.MIZ	3/13/2006 9:15 AM	MIZ File
24792-A.OMN	11/1/2004 3:14 PM	OMN File
T08	5/18/2007 6:01 PM	XML Document

When importing a job with boards requested from your Lumber Yard that have not been added before, this message will appear.

Click **Yes** to continue.
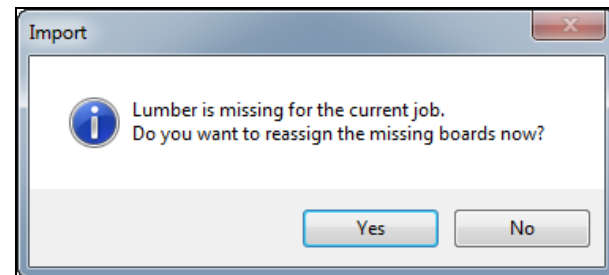
Board Stretcher Operation
Importing a Job - Manually (cont)

To create the Lumber Yard for the job:

Task Bar

3. From the **Task Bar**, click **Lumber.**

Auto	Import	Optimize	Stop	Export	Lumber	Print
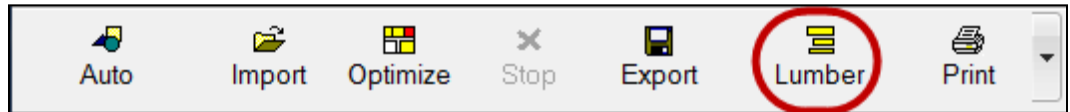
If the *Board Stretcher* program determines that any grades and dimensions of lumber in the job file are not available in the current Lumber Yard, it will allow replacement grades to be selected OR new lumber grades and dimensions to be added to the Lumber Yard.

Materials listed under the **Lumber in Yard** panel are recognized material.

						Lumber in Yard		
Active	Grade	Size	Length	Source	Cost E...	Cost P...	Lengt...	Materials ID
Yes	SPF No.2 D	2x6	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	SPF Stud D	2x6	08-00-00	Magazine	0.00	0.00	00-00-...	
Yes	Wol TREAT...	2x6	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	No.2	2x4	14-00-00	Magazine	0.00	0.00	00-00-...	
Yes	No.3	2x4	09-08-10	Magazine	0.00	0.00	00-00-...	
Yes	SPF No.2 D	2x4	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	Wol TREAT...	2x4	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	SPFSTUD-C...	2x3	04-00-00	Magazine	0.00	0.00	00-00-...	

Materials highlighted in red, under the **Current Job Inventory** panel, are new materials not recognized.

				Current Job Inventory					
Status	Grade	Size	Min. Len.	Reqd Len.	Count	Job	Descri...	Id	Materials ID
Need	No.2 SPF	2x4	13-01-15	13-02-00	2				
Need	Stud SPF	2x4	01-08-02	06-11-01	11				

Board Stretcher Operation
Importing a Job - Manually (cont)

Source - **Bunk** and **Manual** notifies the picker as to where the required material is located. These are more of an internal indicator and are not required by the Blade or Miser.

To add material to the Lumber Yard, highlight an item in red.

	Current Job Inventory					
Status	Grade	Size	Min. Len.	Reqd Len.	Count	Job
Need	No.2 SPF	2x4	13-01-15	13-02-00	2	
Need	Stud SPF	2x4	01-08-02	06-11-01	11	

After completing all fields needed click the **Add** button to add the grade to the Lumber Yard.

Board Stretcher Operation
Adding Material

All information entered in the Lumber Yard is very specific.

NOTE: If entries vary, even just in terms of punctuation or capitalization, Board Stretcher views the entries as separate entries..

There is a function, **Grade Replacement,** that allows for slight variations on input:
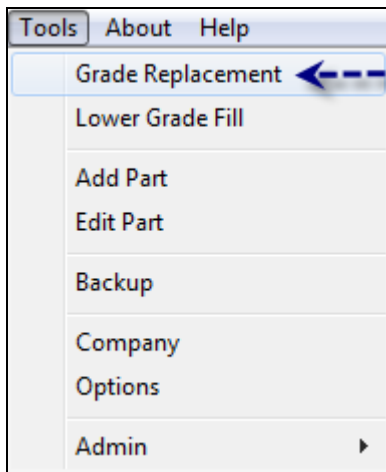
Grade	New Grade	Width
SPF No.2	No.2 SPF	

NOTE:
The entry shown above will remove Grade and replace it with New Grade. SPF No.2 will never exist in the file as it will be overwritten by No.2 SPF
- To have this affect all widths leave the Width column empty.
- To only affect specific widths, such as 2x6, enter a 6 in the Width column.

Another example using Grade Replacement.
- With Grade Replacement, Board Stretcher would recognize that a 2x4 and a 2X4 are the same

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Board Stretcher Operation
Adding Material (cont)

Click a material, in red, in the Current Job Inventory panel and that material will highlight in blue. This material can be added to, or replaced by, material in the lumber yard.

Status	Grade	Size	Min. Len.	Reqd Len.	Count	Job	Descri...
Need	No.2 SPF	2x4	13-01-15	13-02-00	2		
Need	Stud SPF	2x4	01-08-02	06-11-01	11		

Current Job Inventory

Suggested replacement lumber for the new material will be highlighted in green in the Lumber in Yard panel.

Active	Grade	Size	Length	Source	Cost E...	Cost P...	Lengt...	Materials ID
Yes	SPF No.2 D	2x6	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	SPF Stud D	2x6	08-00-00	Magazine	0.00	0.00	00-00-...	
Yes	Wol TREAT...	2x6	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	No.2	2x4	14-00-00	Magazine	0.00	0.00	00-00-...	
Yes	No.3	2x4	09-08-10	Magazine	0.00	0.00	00-00-...	
Yes	SPF No.2 D	2x4	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	Wol TREAT...	2x4	16-00-00	Magazine	0.00	0.00	00-00-...	
Yes	SPFSTUD-C...	2x3	04-00-00	Magazine	0.00	0.00	00-00-...	

Lumber in Yard

To use a substitution material, simply double click one of the materials highlighted in green.

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Board Stretcher Operation
Importing a Job - Manually (cont)

To optimize the parts onto the boards:

4. From the **Task Bar**, click **Optimize.**

> The program then begins the process of placing the parts onto boards.
>
> Different optimizing processes and options are available to the user to achieve the results desired.
>
> The user also has the capability to re-optimize the same job several times using different options to achieve the best results.

NOTE: re-importing previously exported files, optimized files, will result in duplicate print.

Task Bar

| Auto | Import | Optimize | Stop | Export | Lumber | Print |

Board Stretcher Operation
Importing a Job - Manually (cont)

To send the board list to the saw:

5. From the **Task Bar**, click **Export.**

> When the user is satisfied with the optimization results, the job can then be sent via network connection directly to the saw.
>
> The job is then ready to be cut.
>
> After the current job is sent to the saw, the optimization program is ready to import and optimize the next job.

Task Bar

Board Stretcher Operation
Importing a Job - Automatically

To automatically Import a job:

1. From the **Task Bar**, click **Auto.**

Task Bar

MiTek® Learning Channel

The Lumber Yard
Information

- Before *Board Stretcher* can use a type of lumber, it must be added to the Lumber Yard. Ideally, when *Board Stretcher* is installed, all lumber stocked at your facility should be added to the Lumber Yard. Then, future jobs only need to add odd or new lumber, and the daily optimizing tasks flow more smoothly. Adding lumber is a simple procedure, no matter if it occurs before the job is imported or after.

NOTE: Populating the Lumber Yard should be accomplished by opening job files so the grade strings are automatically populated. It is not recommended to type in the grade strings as they must be an exact match to the job files.

- When **Lumber** is clicked, either from the Lumber Menu or from the Task Bar, a second screen appears on top of the primary screen.

- This selection allows you to view and modify your **Lumber Yard,** or the lumber that you make available to the saw. *Board Stretcher* uses this information to optimize your lumber usage.

The Lumber Yard

Entering the Lumber Yard

The two methods for accessing the Lumber Yard are:

1. Click the Lumber button on the Task Bar from the main screen.

2. Click the Lumber menu from the main screen.

Click **YES** to the message that could appear when importing a new job:

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The Lumber Yard
Add Lumber and Reassign Boards in Active Jobs

1. Click one of the missing lumber types in the left column (Current Job Inventory). **Missing lumber is highlighted in red.**

   - The Grade field automatically populates with the lumber selected in the left column.

   - Existing lumber that is a valid substitution gets highlighted green in the right column (Lumber in Yard).

NOTE: Before replacing material grades at this screen, ensure the lumber is physically stocked in inventory, or will be when the sawyer is ready to cut this job. This information is not tied in with the user's physical inventory software

The Lumber Yard

Add Lumber and Reassign Boards in Active Jobs (cont)

2. Either assign a substitution or add the missing lumber. Both options are described here.

    a) To assign a substitution:

        1) Double-click a green lumber type in the right column.

        2) Click **Yes** when the system asks you to verify your choice.

    b) To add lumber to the Lumber Yard from this screen:

        1) Click the lumber in the left column that is missing so it populates the fields in the middle column.

        2) Adjust the Size, Length, Source, Cost, and Penalty fields if necessary.

        3) Click the **Add** button.

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The Lumber Yard
Add Lumber without an Active Job

> **NOTE:** Populating the Lumber Yard should be accomplished by opening job files so the grade strings are automatically populated. It is not recommend to type in the grade strings.

To add lumber to the Lumber Yard before a job is imported:
1. Enter the Lumber Yard (use instructions described in the Enter Lumber Yard section covered previously)
2. In the middle column in the **Add Lumber section**, type the grade name, **NOT RECOMMENDED,** into the Grade field.

> **NOTE:** Type the Grade following format guidelines agreed upon at your facility. It must EXACTLY match the design file's grade name for the lumber, or the system will not recognize it as an existing lumber.

3. Fill in the **Size** from the drop-down menu (2x3, 2x4, etc.)
4. Fill in the **Length** from the drop-down menu (12-6-0 equals 12 ft. 6 in. and no sixteenths of an inch),
5. Fill in the **Source** from the drop-down menu.
6. The **Cost** field should be filled in only if cost will be considered over material usage when determining acceptable waste.

NOTE: Penalty fields will be explained in another step.

7. Click the **Add** button.

MiTek® Learning Channel

The Lumber Yard
Remove Material from the Lumber Yard

Reasons to remove material from the Lumber Yard:

- You no longer inventory a certain lumber
- Cleaning out your Board Stretcher Lumber Yard

To permanently remove material from the Lumber Yard:

- Under Lumber Yard, select a lumber type in the right panel and click the **Remove Selected Items** button.

	Lumber in Yard						
Active	Grade	Size	Length	Source	Cost E...	Cost P...	Lengt...
Yes	SPF Stud D	2x6	08-00-00	Magazine	0.00	0.00	00-00-...
Yes	Wol TREAT...	2x6	16-00-00	Magazine	0.00	0.00	00-00-...
Yes	SPF No.2 D	2x4	16-00-00	Magazine	0.00	0.00	00-00-...
Yes	Wol TREAT...	2x4	16-00-00	Magazine	0.00	0.00	00-00-...

Add Lumber

Grade	SPF No.2 D
Size	2x6
Length	16-00-00
Source	Magazine
Cost	0.00
Cost Penalty	0.50
Length Penalty	00-06-00

Add >>>

Remove/Update Selected

Active	☑	Update

Grade — Update
Wol TREATED D

Source — Magazine — Update

Cost — 0.00 — Update

Cost Penalty — 0.00 — Update

Length Penalty — 00-00-00 — Update

Remove Selected Items

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The Lumber Yard
Temporarily Prevent Material Use

The user can prevent a type of lumber from being used without removing it from the Lumber Yard.

- **Example:** You ran out of 16-ft lumber, and it won't be here for another week.

To prevent lumber usage:

- From the center section of the Lumber Yard (Add Lumber), remove it from **active duty** by unchecking its **Active** checkbox.

- When the lumber becomes available , just enter the Lumber Yard, select that lumber, and check the checkbox again.

The Lumber Yard
Penalty Fields

A **Penalty** is a feature that allows the user to discourage *Board Stretcher* from using a certain type of lumber, while still allowing it when necessary. The higher the penalty, the stronger the discouragement for using.

There are different types of penalties:

1. **Cost Penalties -** make the software think the lumber costs more than it really does.
   a) Default cost penalty
   b) Optimization cost penalty

2. **Length Penalties -** make the software think there is more waste on a type of lumber than there really is.
   a) Default length penalty
   b) Optimization length penalty

NOTE: Default penalties are what will default when adding new lumber and are based on what the source is. Whatever penalty is shown in the Lumber Yard on the right side will be the penalty used.

The Lumber Yard
Length Penalty Examples

When lumber is first added to the Lumber Yard any penalty added will be referred to as the default penalty.

- **Example 1 -** You started working with a new client, and are getting more trusses that would benefit from 20-ft lumber, but it is very expensive to buy. You want to use this lumber only when it's absolutely necessary. So, when you add it to the Lumber Yard you placed a 2-ft length penalty, using the Add Lumber section.

When a penalty is assigned because a change in inventory or policy requires a short-term change in lumber usage. Usually a length penalty in both of these cases is two feet less than the length of the board.

- **Example 2 -** You're running low on 16-ft lumber of a certain grade, and your supplier can't get you more for several weeks. You typically use a lot of 16-ft lumber because it optimizes well, but now, you want to use it only when absolutely necessary. So, enter the Lumber Yard and add a length penalty at the bottom of the middle column.

The Lumber Yard
Penalty Information

Penalties - how much of the total length, or additional cost per board, is to be considered waste or expense in the Board Stretcher algorithm prior to it calculating waste/cost to determine efficient lumber usage.

> **NOTE:** Penalties do not have a direct effect because the software uses many inputs to optimize board outputs.

> **NOTE:** Penalties can be set up before or after material is added

When considering **Cost** and **Length** penalties, it is recommended to use Length and must be optimized by waste

- **Length Penalty**
  - Once the length penalty behavior is set, material price does not affect the length penalty. The only determination is whether the board is available or not.
- **Cost Penalty**
  - Cost is an advanced form of penalties and does not follow any database currently in use.
  - Creates a second costing location that must be maintained.
  - With a lumber cost increase the cost penalty dynamic changes. Cost penalties must be updated manually.
  - Using the same lumber price increase for the cost penalty changes the dynamic of the cost penalty.
  - Material price increase and cost penalty are not proportional.

> **NOTE:** There are many settings available in penalty options to create certain behaviors for lumber use but there are almost no absolutes. What happens with settings in penalties is a persuasion to the algorithm that decides what is used but it does not dictate what you can or cannot do.

The Lumber Yard
Penalty Example

> **NOTE:** This example uses an empty Lumber Yard

A job being imported contains the following 2 materials.

Status	Grade	Size	Reqd Len.	Count	Job	Descri...	Id	Materials ID
Need	2 X 4 SPF No.2	2x4	12-08-08	36				
Need	2 X 6 SPF No.2	2x6	07-08-08	4				

Current Job Inventory

These 2 materials are stocked in 16' and 20' each and are added to the Lumber Yard.

Active	Grade	Size	Length	Source	Cost E...	Cost P...	Lengt...
Yes	2 X 6 SPF No.2	2x6	20-00-00	Manual	0.00	0.00	00-00-...
Yes	2 X 6 SPF No.2	2x6	16-00-00	Manual	0.00	0.00	00-00-...
Yes	2 X 4 SPF No.2	2x4	20-00-00	Manual	0.00	0.00	00-00-...
Yes	2 X 4 SPF No.2	2x4	16-00-00	Manual	0.00	0.00	00-00-...

Lumber in Yard

All Penalties remain off at this time.

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The Lumber Yard
Penalty Example (cont)

After clicking Optimize, below is the list of material under the **Boards / Board Data tab**

Id	Grade	Size	Length	Source	Batch	Parts	Waste	Length Eff.	Cost Eff.
1	2 X 4 SPF No.2	2x4	20-00-00	Manual	Baseline Job-Ext 1	2	01-01-08	94.4%	
2	2 X 4 SPF No.2	2x4	20-00-00	Manual	Baseline Job-Ext 1	2	01-01-08	94.4%	
3	2 X 4 SPF No.2	2x4	20-00-00	Manual	Baseline Job-Ext 1	3	00-01-00	99.6%	
4	2 X 4 SPF No.2	2x4	20-00-00	Manual	Baseline Job-Ext 1	3	00-01-00	99.6%	
5	2 X 4 SPF No.2	2x4	20-00-00	Manual	Baseline Job-Ext 1	2	00-01-03	99.5%	
6	2 X 4 SPF No.2	2x4	20-00-00	Manual	Baseline Job-Ext 1	2	00-01-03	99.5%	
7	2 X 4 SPF No.2	2x4	20-00-00	Manual	Baseline Job-Ext 1	4	00-11-06	95.3%	
8	2 X 4 SPF No.2	2x4	16-00-00	Manual	Baseline Job-Ext 1	2	00-01-08	99.2%	
9	2 X 4 SPF No.2	2x4	16-00-00	Manual	Baseline Job-Ext 1	2	00-01-08	99.2%	
10	2 X 4 SPF No.2	2x4	16-00-00	Manual	Baseline Job-Ext 1	3	00-04-11	97.6%	
11	2 X 4 SPF No.2	2x4	16-00-00	Manual	Baseline Job-Ext 1	3	00-04-11	97.6%	
12	2 X 4 SPF No.2	2x4	16-00-00	Manual	Baseline Job-Ext 1	3	00-10-00	94.8%	
13	2 X 4 SPF No.2	2x4	16-00-00	Manual	Baseline Job-Ext 1	5	00-10-12	94.4%	
14	2 X 6 SPF No.2	2x6	16-00-00	Manual	Baseline Job-Ext 1	2	00-07-00	96.4%	
15	2 X 6 SPF No.2	2x6	16-00-00	Manual	Baseline Job-Ext 1	2	01-08-00	89.6%	

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The Lumber Yard
Penalty Example (cont)

Under the **Boards / Lumber Data tab** is the pick list for material.

Grade	Size	Length	Source	Quantity	TotalBoardLength	TotalBoardEfficien	TotalWasteLength
2 X 6 SPF No.2	2x6	16-00-00	Manual	2	32-00-00	93.0%	02-03-00
2 X 4 SPF No.2	2x4	20-00-00	Manual	7	140-00-00	97.5%	03-06-12
2 X 4 SPF No.2	2x4	16-00-00	Manual	6	96-00-00	97.1%	02-09-03

For this example, it was decided that 20' material is not to be used, due to cost, and a length penalty will be assigned.

NOTE: Longer material increases board efficiency but is less cost effective.

To add a penalty
- Click the Lumber button to return to your lumber yard
- Highlight the 20' 2x4 SPF No.2 material in the lumber yard
- Under Length Penalty enter 4' **(the length penalty entered tells the program to consider the penalty as waste)**

Cost
0.00 Update

Cost Penalty
0.00 Update

Length Penalty
04-00-00 Update

The Lumber Yard
Penalty Example (cont)

Once the length penalty has been added click the **Optimize** button again to see results.

	Lumber in Yard							
Active	Grade	Size	Length	Source	Cost E...	Cost P...	Lengt...
Yes	2 X 6 SPF No.2	2x6	20-00-00	Manual	0.00	0.00	00-00-...
Yes	2 X 6 SPF No.2	2x6	16-00-00	Manual	0.00	0.00	00-00-...
Yes	2 X 4 SPF No.2	2x4	20-00-00	Manual	0.00	0.00	04-00-...
Yes	2 X 4 SPF No.2	2x4	16-00-00	Manual	0.00	0.00	00-00-...

Before length penalty

Parts | Boards | Assemblies | Optimizations

Lumber Data | Board Data | Board Errors | Board Graphics

Grade	Size	Length	Source	Quantity	TotalBoardLength	TotalBoardEfficien	TotalWasteLength
2 X 6 SPF No.2	2x6	16-00-00	Manual	2	32-00-00	93.0%	02-03-00
2 X 4 SPF No.2	2x4	20-00-00	Manual	7	140-00-00	97.5%	03-06-12
2 X 4 SPF No.2	2x4	16-00-00	Manual	6	96-00-00	97.1%	02-09-03

After length penalty added and re-optimized – notice the drop in TotalBoardEfficiency

Parts | Boards | Assemblies | Optimizations

Lumber Data | Board Data | Board Errors | Board Graphics

Grade	Size	Length	Source	Quantity	TotalBoardLength	TotalBoardEfficien	TotalWasteLength
2 X 6 SPF No.2	2x6	16-00-00	Manual	2	32-00-00	93.0%	02-03-00
2 X 4 SPF No.2	2x4	16-00-00	Manual	16	256-00-00	89.7%	26-03-15

The Lumber Yard

Penalty Additional Information

Additional persuasion factors, found in **Tools > Admin > Edit Configuration,** can be added with settings for:

- **Optimizes Longest Boards –** will use the longest boards available. This influences the algorithm to ignore penalties..

- **Optimize for Saw Performance –** the saw receives a bonus percentage in terms of how much lumber is being saved vs how much is being used for nesting cuts. If a board has an angle cut that matches another angle cut the program will re-orient one board and nest the cuts. The saw receives a 10% efficiency bonus when this happens.

MiTek® Learning Channel

Viewing Data
Parts

When the **Parts Tab** is selected in the Primary Tabs section, the Secondary Tabs reflect the selection.

| Parts | Boards | Assemblies | Optimizations |
| Part Data | Part Errors | Part Graphics |

Secondary Tabs

In the Parts Data window, the data is populated by the design file.
- **Group -** the stack on the truck if the design file specifies.
- **Assembly -** the truss or wall panel.
- **Description -** the individual part descriptions.

	Id	Job	Group	Assembly	Description	Grade	Size	OA Len.	Qty.	PartType	Batch	Has Error
	1	24792		X	W2	SPFSTUD-CAN	2x3	02-08-01	4	TopChord		
	2	24792		M	G3	SPFSTUD-CAN	2x3	02-04-03	4	Web		
	3	24792		RX	G3	SPFSTUD-CAN	2x3	02-03-08	4	Web		
	4	24792		M	G2	SPFSTUD-CAN	2x3	01-08-13	4	Web		
	5	24792		RX	G2	SPFSTUD-CAN	2x3	01-08-02	4	Web		
	6	24792		M	G1	SPFSTUD-CAN	2x3	01-00-13	4	Web		
	7	24792		RX	G1	SPFSTUD-CAN	2x3	01-00-02	4	Web		

Part Data | Part Errors | Part Graphics

Viewing Data
Parts (cont)

Part Error - If any of the parts contain an error they will be listed under the Part Errors tab.
- The **ID, Job, Description** are the same as the **Part Data tab.**
- **Level** indicates **Warn** or **Err**.
- **Error Msg** displays the error message.
  - If the **Level = Warn** the part will still be included in the optimization,
  - if the **Level = Err** the part will not be included in the optimization..

Primary Tabs

| Parts | Boards | Assemblies | Optimizations |

| Part Data | Part Errors | Part Graphics | **Secondary Tabs** |

| Id | Job | Description | Level | Error Msg. |

| Part Data | Part Errors | Part Graphics |

0 : T1 : T1

View Part
Edit Part
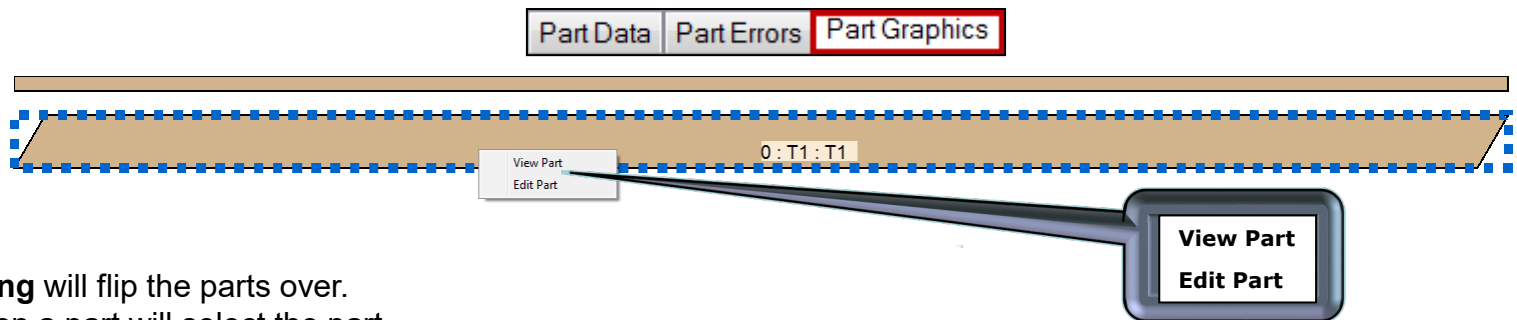
View Part

Edit Part

Part Graphics –
- **Double clicking** will flip the parts over.
- **Left clicking** on a part will select the part,
- Once selected, **right clicking** on the part will show a menu with the following selections:
  - **View Part** shows the part in the 3D viewer.
  - **Edit Part** shows the key-in interface populated with the part's information to allow for editing.

NOTE: To right click on a touch screen, press and hold

Viewing Data
Boards

When the **Boards Tab** is selected, in the Primary Tabs section, the Secondary Tabs reflect the selection.

Primary Tabs

| Parts | Boards | Assemblies | Optimizations |

| Lumber Data | Board Data | Board Errors | Board Graphics |

Secondary Tabs

In the Lumber Data window, the following information is available for the job:

- **Length –** material length used
- **Source –** how the material is entering the saw
- **Quantity –** total number of this material needed
- **Total Board Ln. –** the total board footage of all pieces for this length
- **Length Eff. -** the efficiency percentage of the pieces cut from the selected board length
- **Total Waste Length –** the amount of waste after all pieces are cut from a quantity of boards

| Lumber Data | Board Data | Board Errors | Board Graphics |

Grade	Size	Length	Source	Quantity	Total Board Ln.	Length Eff.	TotalWasteLength
SPF No.2 D	2x6	16-00-00	Magazine	21	336-00-00	93.6%	21-06-12
SPF Stud D	2x6	08-00-00	Magazine	18	144-00-00	95.6%	06-04-12
Wol TREATED D	2x6	16-00-00	Magazine	6	96-00-00	84.8%	14-07-08

Viewing Data
Boards (cont)

When the **Boards Tab** is selected, in the Primary Tabs section, the Secondary Tabs reflect the selection.

Primary Tabs

Parts	Boards	Assemblies	Optimizations

Lumber Data	Board Data	Board Errors	Board Graphics

Secondary Tabs

In the Board Data window, the data is populated by the design file per board.

*   **Source –** how the material is entering the saw
*   **Waste –** the amount of waste after the pieces are cut
*   **Length Eff. -** the efficiency percentage of the pieces cut from the selected board length. Does not reflect remainder usage at the saw itself.

Lumber Data	Board Data	Board Errors	Board Graphics						
Id	Grade	Size	Length	Source	Batch	Parts	Waste	Length Eff.	Cost Eff.	Has Error
1	SPF No.2 D	2x6	16-00-00	Magazine		2	00-04-00	97.9%		
2	SPF No.2 D	2x6	16-00-00	Magazine		2	00-00-08	99.7%		
3	SPF No.2 D	2x6	16-00-00	Magazine		2	00-04-00	97.9%		
4	SPF No.2 D	2x6	16-00-00	Magazine		2	00-05-00	97.4%		
5	SPF No.2 D	2x6	16-00-00	Magazine		2	01-04-08	91.4%		

Viewing Data
Boards (cont)

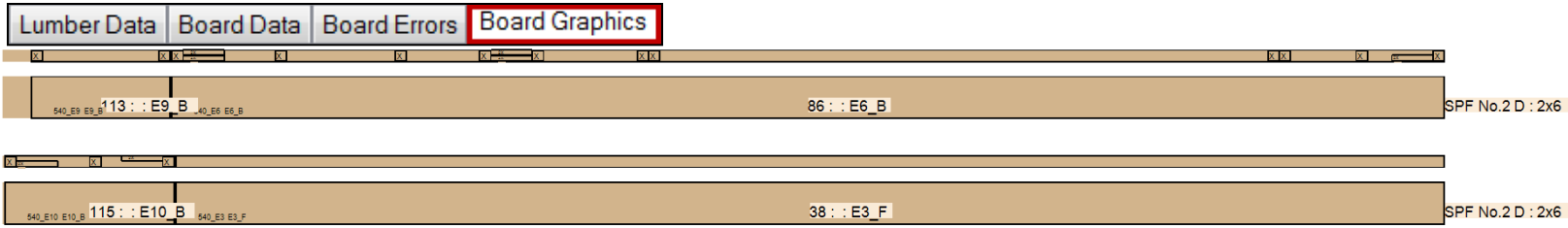**Board Errors -** If any of the boards contain an error they will be listed under the Board Errors tab.
- The **ID, Grade, Size, Length** are the same as the **Board Data tab.**
- **Level** indicates "**Warn**" or "**Err**"
- **Error Msg** displays the error message.
  - If the **Level = Warn** the board will still be included in the optimization,
 - If the **Level = Err** the board will not be included in the optimization.
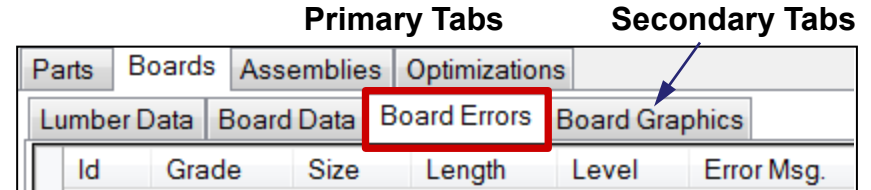
Board Graphics –
- Double clicking will flip the boards over.
- Left clicking on a individual part of a board will show the 3D viewer for the part.

Primary Tabs   **Secondary Tabs**

Parts	Boards	Assemblies	Optimizations
Lumber Data	Board Data	Board Errors	Board Graphics
Id	Grade	Size	Length	Level	Error Msg.

| Lumber Data | Board Data | Board Errors | Board Graphics |

NOTE: The red line indicates a board that only has short parts on it. When this happens, Board Stretcher has to slide everything to the front. The front of the last part has to be past that line so the gripper can position for it.
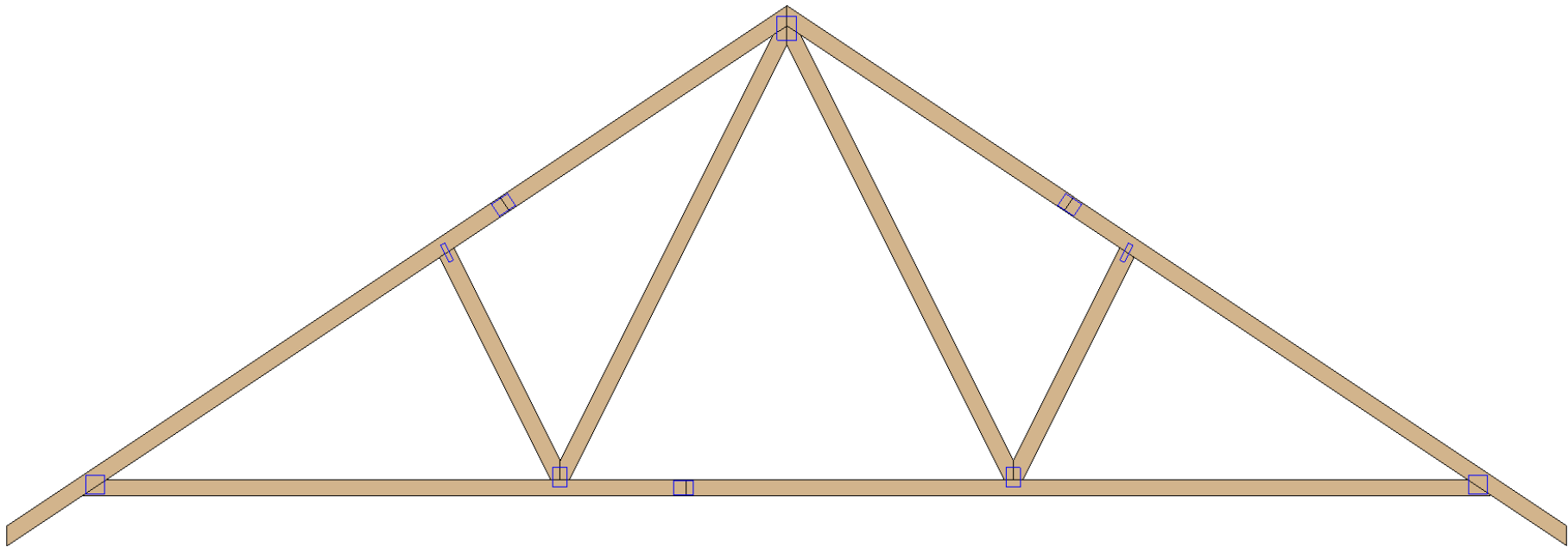
MiTek® Learning Channel
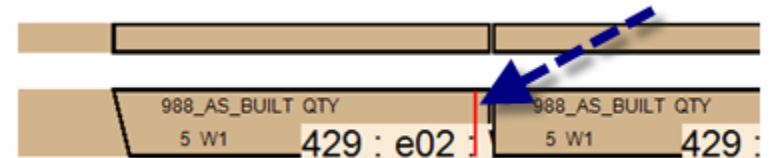
Viewing Data
Assemblies

Assembly Graphics - displays the image of the fabricated component the cut pieces will produce.

Parts	Boards	Assemblies	Optimizations
Assy Graphics			

Secondary Tabs

Viewing Data

Optimizations

Optimizations - The Optimizations tab allows you to compare different optimizations of the same file. Settings can be changed and the file re-optimized. The best optimizations can be found using this method.

Definitions:

- **Length Efficiency =** Overall length of all parts of all boards x 100
- **Volume Efficiency =** Volume (board feet) of parts of all boards x 100
- **Board Feet** of boards used
- **Cost** of the boards if optimizing by cost
- **Quantity of parts** which share one common angle with another adjacent part on the board.
- **Quantity of parts** which share two or more common angles with another adjacent part on the board.

- When adjacent parts share common angles the saw will stroke into the wood fewer times increasing the production rate.
  - o **Saw Strokes Saved** indicates how many strokes are saved.

	Date	Files	Length Eff.	Volume Eff.	BoardFeet	Cost	Qty Parts Single Nested	Qty Parts Multiple Nested	Saw Strokes Saved
▶	11/7/2014 7:48 AM	540-1	69.5%	69.5%	768.0	0.0	68	0	68
	11/7/2014 7:49 AM	540-1	92.6%	92.6%	576.0	0.0	71	0	71

(Tabs above table: Parts | Boards | Assemblies | Optimizations)

Remainders

Remainders - Remainders are commonly used parts cut from the natural waste inside a job. They can be set aside and used in future jobs as needed. Remainders are set in the saw software, if your saw has that capability.

If remainders are set up efficiently the Blade Report will show better results than Board Stretcher

When Batching is used for truss-by-truss or wall-by-wall, setting up more detailed remainders will use more cutoff material. This will improve efficiency on the Blade.

Remainders may be cut at the Blade or at another saw. Cutting many short boards at the Blade will increase cut time.

Blade efficiencies are higher with longer boards and lower with shorter boards due to the load time of material.

NOTE: Board Stretcher does not know what the saw does with remainders.