TPS⁴

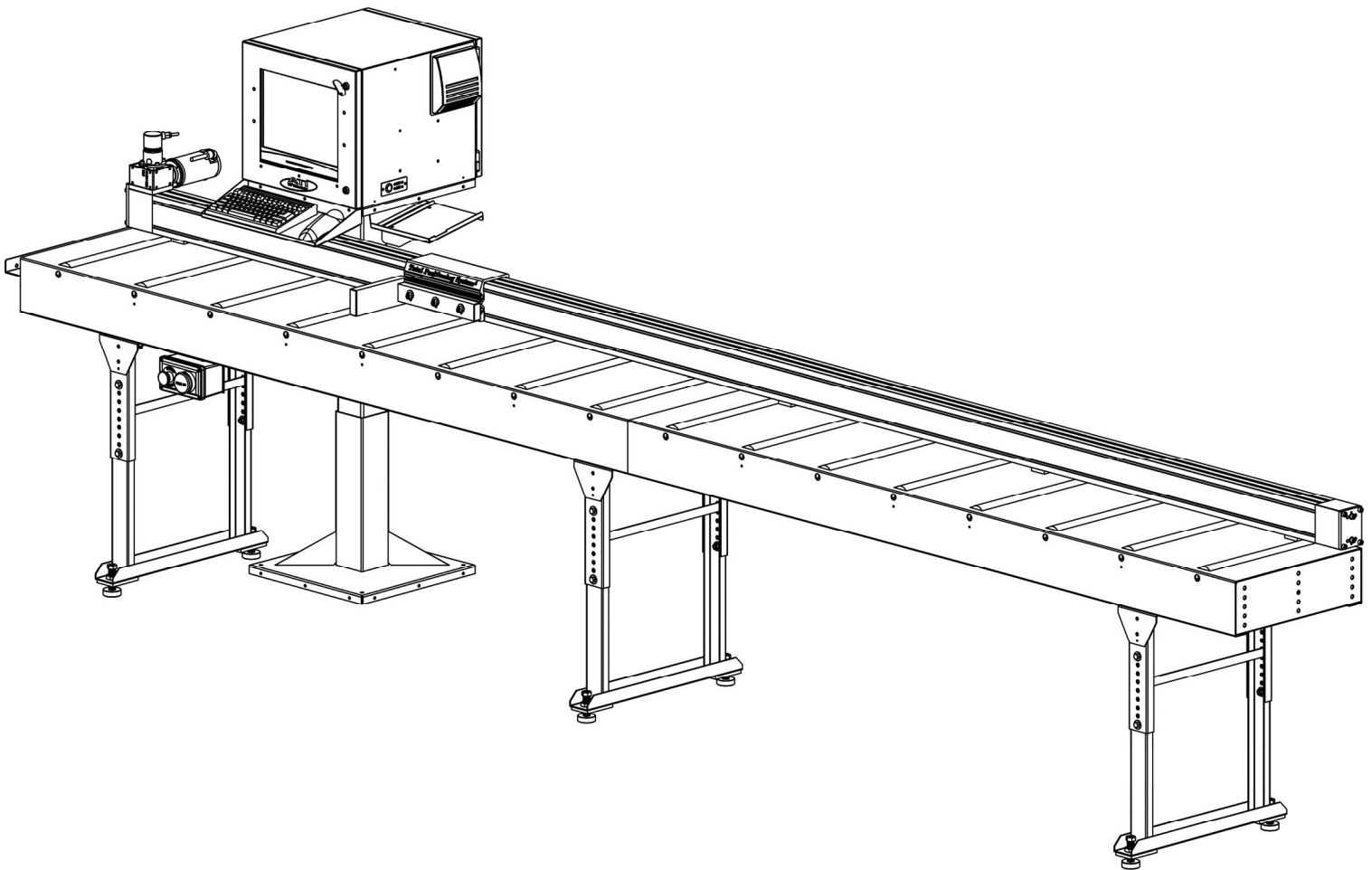# Setup & User's Guide

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Table of Contents

OPTIMIZATION

MACHINE SETUP CONTROLS

LEVEL II: DROP BINS

HOW DO I?

TROUBLESHOOTING

GLOSSARY

Introduction

The Total Positioning System[4] (TPS[4]) is the most complete package on the market today. Its ability to provide organization to a cutting operation results in unparalleled efficiencies. TPS[4] combines the sophistication of DeMichele's real time lineal optimizer and inventory control software with the repeatable accuracy of our automated saw stop. It's not just providing patterns or moving a saw stop; it's providing optimum yields based on stock and cutoff inventory on a real time basis and directing the throughput from this station back into production. The graphical displays guide the operator, while the accuracy of our smart controlled saw stop ensures the quality of each cut.

Features:

Real time optimization - TPS[4] provides increased yields and productivity over any paper system because it reacts on the fly to damaged, missing or additional materials to be cut. TPS[4] maximizes product yields by taking advantage of not only the stock inventory but also the valuable cutoff inventory that is normally overlooked.

Multiple cuts - to increase productivity, TPS[4] groups multiple cuts together. This eliminates the repetitious cutting of common sizes. Once cut TPS[4] forwards the cut material into production and tracks the cutoffs for future use.

Cutoff inventory control - the dynamic cutoff inventory control automatically logs all cutoffs by stick type, color and size. This allows TPS[4] to direct the operator to a specific piece of cutoff to be used in the production run.

Integration of sticks into production - TPS[4] assigns rack locations for the completed sticks to coordinate their return into the production cycle.

Performance Gains:

Based on feedback from our customers, TPS[4] has proven to provide dramatic results in the following areas:

Organizational improvements - *the structure and control that TPS[3] provides will increase the overall efficiencies of the cutting operation. This includes human resources as well as material.*

Increased yields - *the combined strengths of our real time optimizer and cutoff inventory controls, increases yields dramatically.*

Increased throughput - *the coordination, speed and accuracy provided by TPS[4] increases the potential volume of material cut per station.*

Reduced cutting errors - *the accuracy of the stop and direction provided to the operator from the visual displays reduces the likelihood of cutting errors.*

Hardware Setup

Unpacking the TPS-4 System

The TPS4 system is packaged in crates, pallets and boxes.

1. To unpack the MAIN RAIL open the top cover of the crate by removing the Phillips screws.

    With the assistance of another person, lift the positioner out of the wood crate and place it on the ground to remove any access packaging material.

2. Unwrap all tables and legs from pallets and lay them out for assembly.

3. Unpack boxes with computer enclosure and controller.

4. Inspect all components for any damage that might have occurred during shipping.

If you happen to find any damaged parts, please call ATI & The DeMichele Group at (480) 985-4926 and a Customer Support Representative will resolve any problems.

Tools Needed for Assembly

The following is a list of tools that are typically required for the installation of the Total Positioning System 4. Based on your specific requirements, you may need additional tools.

1. Allen (Hex) Wrenches—Metric

2. Drill with a 5/16" or 3/8" bit

3. Flat Head and Phillips Screwdriver

4. Adjustable Wrench or Wrench Set

5. Razor knife

Parts List

The following is a list of the standard components shipped with the TPS4 System.

1. **TPS4 Rail Assembly with or without Flip Stop**

2. **Table Tops - Flat or Roller**

3. **Table Legs**

4. **Controller Enclosure Stand**

5. **Controller Enclosure**

    Touch Screen Monitor

    TPS4 Controller

    Computer

    Keyboard

    Mouse

    All necessary Cables

6. **Gang Stop or Pusher Arm**

7. **Emergency & Continue Switch Box**

    All necessary Hardware and Instruction Manuals

SYSTEM CONTENT
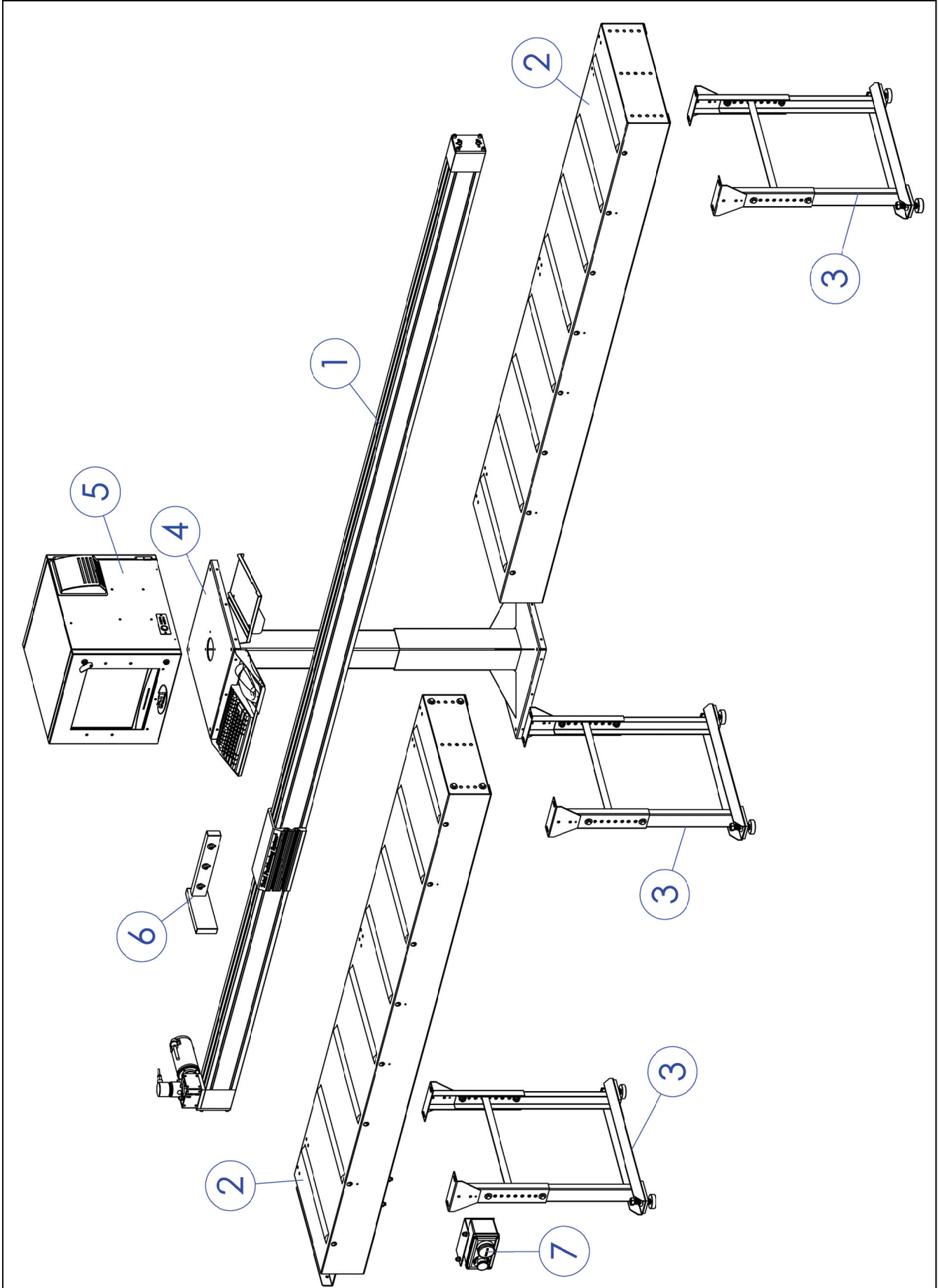
1. Table Leg Assembly

First select the proper height of the Leg Assembly and than bolt together as shown in "Figure: 1.1".

Insert the micro adjust Leveling Bolts and Hex Nut as shown in "Figure: 1.1".

Adjust height after legs are assembled to table top..

Figure: 1.1
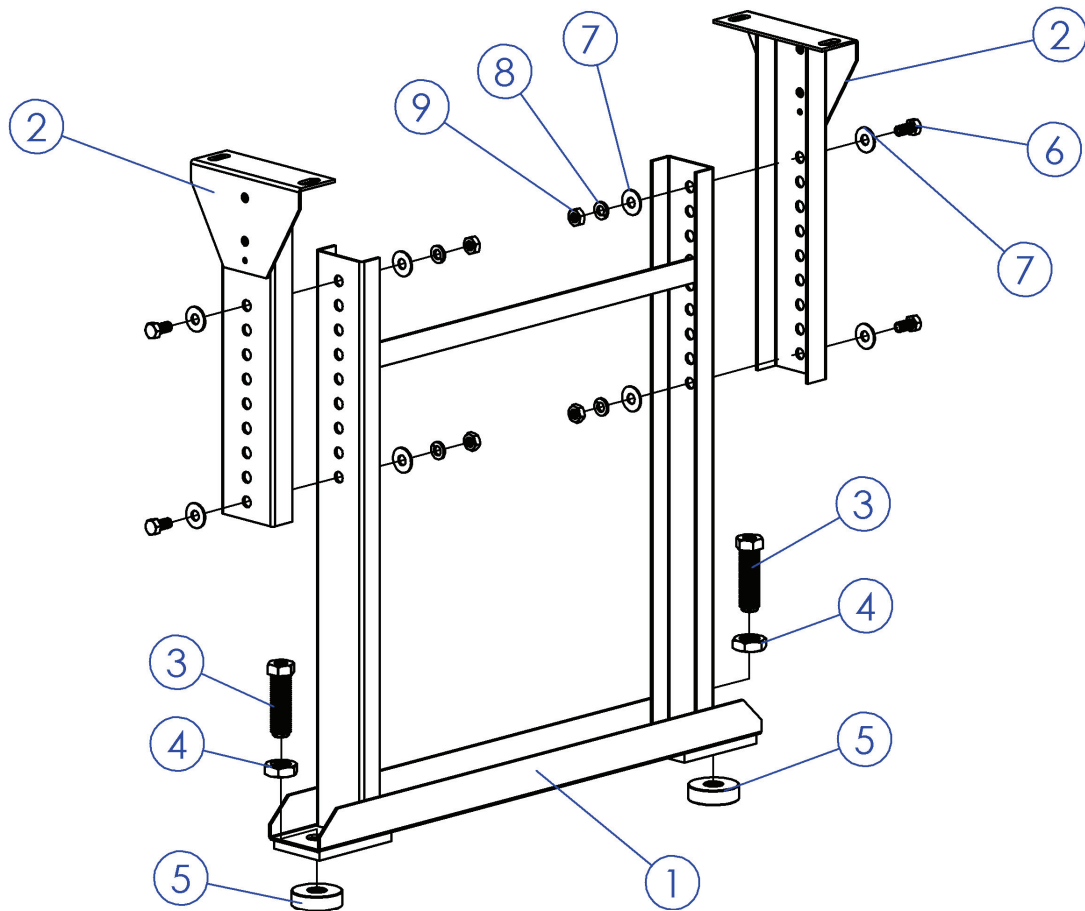
ITEM NO.	QTY.	DESCRIPTION
1	1	BASE FRAME
2	2	UPPER FRAME
3	2	LEVELING BOLTS, M20
4	2	LEVELING PADS FOR M20
5	2	HEX NUTS FOR M20
6	4	HEX BOLT, 3/8-16 X 1"
7	8	WASHER FLAT, 3/8"
8	4	LOCK WASHER, 3/8"
9	4	HEX NUT, 3/8-16

2. Table Assembly

Bolt Table Tops (1) together as shown in "Figure 2.1". Bolt Legs (2) to Table Top (1) as shown in "Figure 2.1". Space Legs evenly depending on length of tables. Attach Saw Adapter Bracket (3) as shown in "Figure 2.1".

Figure: 2.1

ITEM NO.	QTY.	DESCRIPTION
1	2	TABLE TOP
2	4	TABLE LEGS
3	1	SAW ADAPTER BRACKET
4	23	HEX BOLT, 3/8-16 X 1" W. WASHER
5	23	HEX NUT W. LOCK & FLAT WASHER

DETAIL B
SCALE 1 : 10

DETAIL A
SCALE 1 : 10

DETAIL C
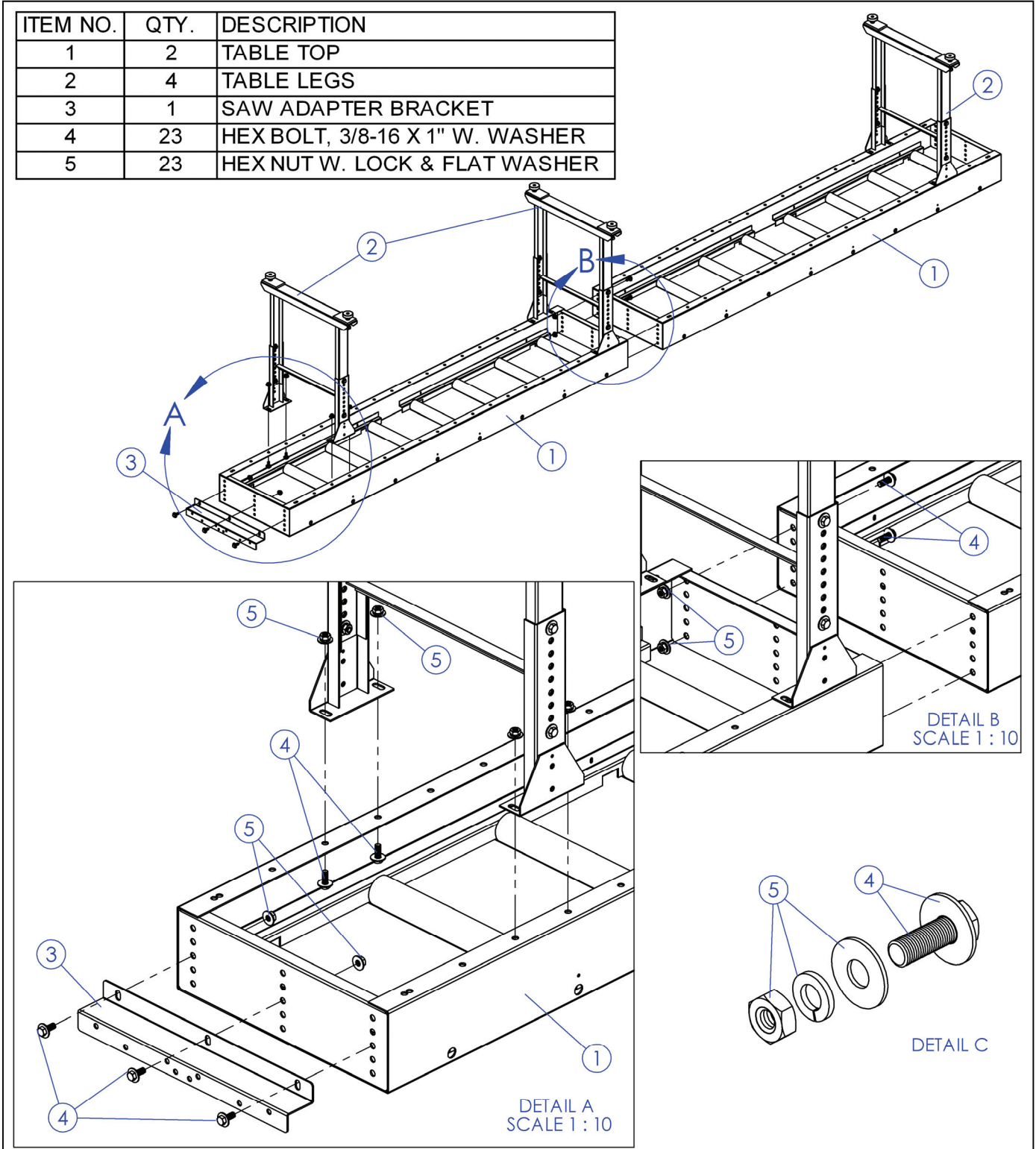
3. Main Rail Mounting to ATI-Table

ATI Flat and Roller Tables (2) are predrilled for mounting the rail (1). Use the T-Nuts and M8 x 35mm Screws (4) located in the bottom of the rail to mount the rail to the table as shown in "Figure 3.1". Use Spacer Plate (3) only for Roller Tables. Use supplied Flat Washer, Lock washer and Hex Nut (5) to fasten the Rail (1) to Table (2).

Figure: 3.1

ITEM NO.	QTY.	DESCRIPTION
1	1	TPS4 POSITIONER RAIL
2	1	TABLE ASSEMBLY
3	5	SPACER BLOCK, 3/8"
4	10	T-NUT W. SET SCREW, M8 X 35
5	10	HEX NUT, M8 W. LOCK & FLAT WASHER
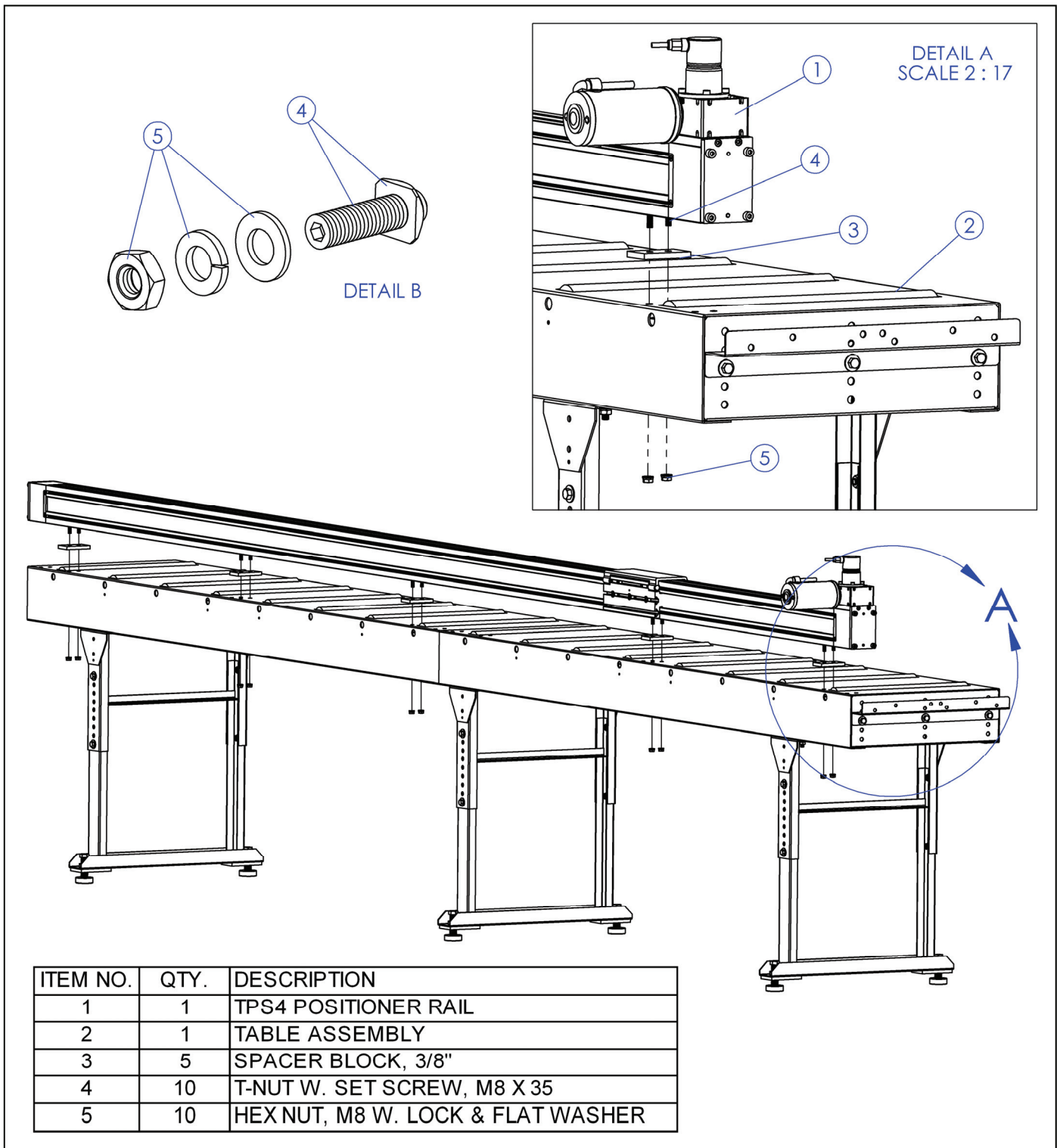
3a. Main Rail Mounting to Other Table

1. Determine the best alignment for the rail on your cutting table.

2. Use the M8 bolts and T-nuts located in the bottom or back grooves of the rail to mount the rail to your table.

3. The rail can be mounted either from the bottom or from the back.

4. The table on which the rail will be mounted should have a metal or hard wood top that is smooth and level. It is also recommended that the legs of the table be bolted to the floor or otherwise secured to prevent rocking motions while the positioner is in operation.

Bottom Mounting:

1. When Bottom Mounting, mark the center of each T-nut channel opening on your cutting table with a pen, and   then slide the rail away before drilling the holes, to avoid drilling into the rail.

2. The mounting holes should be drilled into the table frame or underlying support structure. Do not attach the rail only to the tabletop, as most table surfaces are too thin to provide adequate strength for the mounting hardware.

Suggested Mounting Position - You should bolt the rail down to the table every 4 feet.

Back Mounting

1. A mounting bracket should be placed at each end of the rail and the remaining brackets placed at even spacing along the rest of the rail.

2. Align the T-nuts in the rail with the hole spacing on the mounting brackets and then lightly tighten the M8 bolts into the T-nuts.

3. With all of the mounting brackets loosely attached and properly spaced on the rail, mark the locations on the cutting table where holes will need to be drilled.

4. After holes have been drilled in the table, you will need to obtain the proper length M8 bolts and nuts to mount the brackets to the table.

5. Washers can be used to increase the strength of the hole if desired.

6. Once all the mounting brackets have been bolted to the table, check to make sure the rail is still level and will not have any obstructions along the surface of the table.

7. Tighten all of the bolts when finished. This will enable the slider to move freely without hitting or contacting the table surface during your cutting operations.
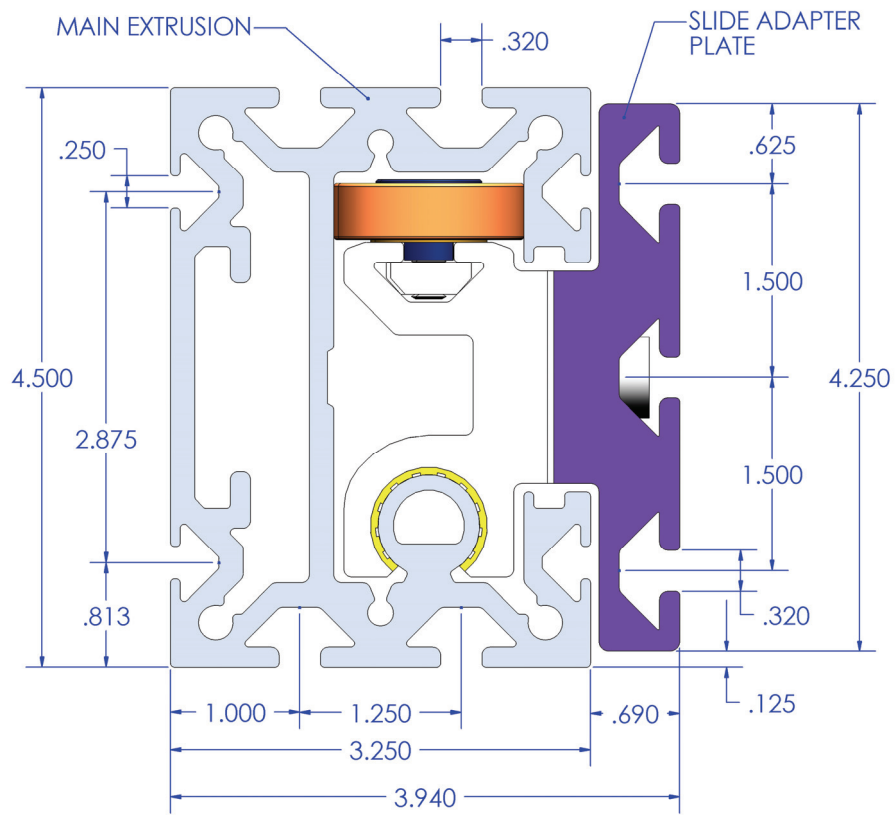
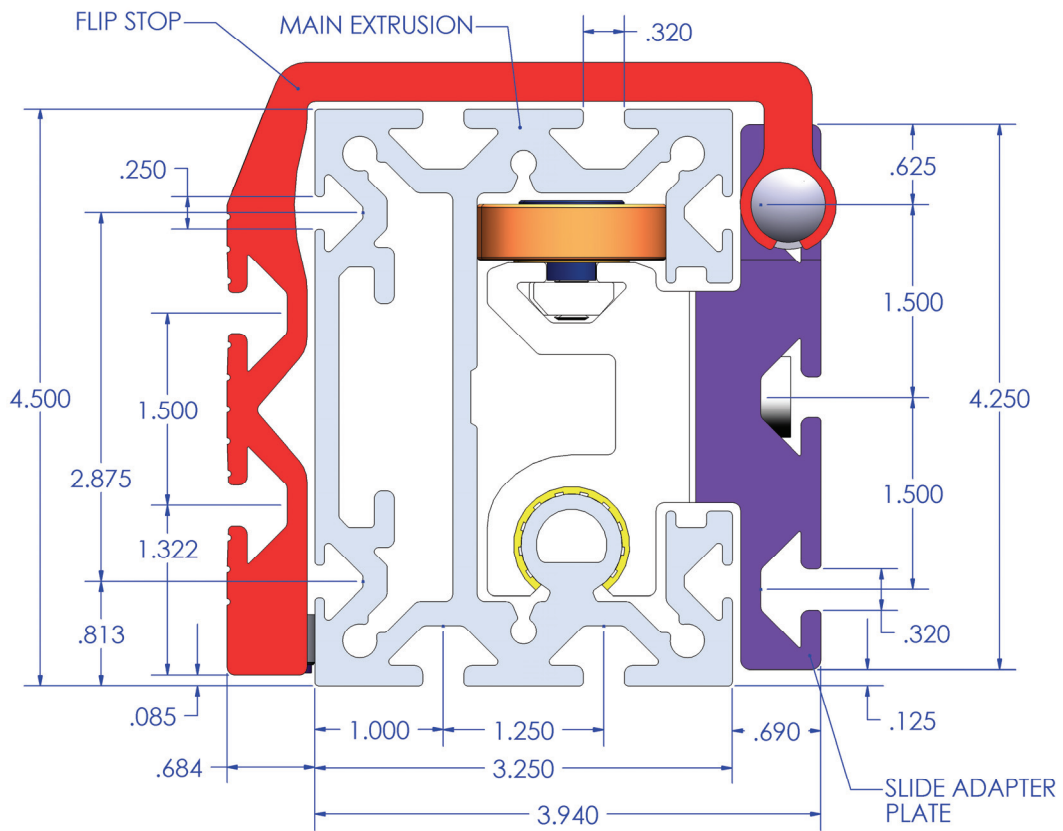*Figure 3a.1 TPS4 with Slide Plate Measurements*

Figure 3a.2 TPS4 with Flip Stop Measurements

4. Gang Stop/Pusher Arm Assembly

Bolt Gang Stop/Pusher Arm to (2) Flip Stop Plate (1) by sliding the T-Nuts (4) into bottom track of Flip Stop (1) and Fastener (3) as shown in "Figure 4.1". Make sure the Gang Stop/Pusher Arm is square to the rail and table. Standard Gang Stop/Pusher Arm Lengths are 12.0", 18.0" & 24.0"
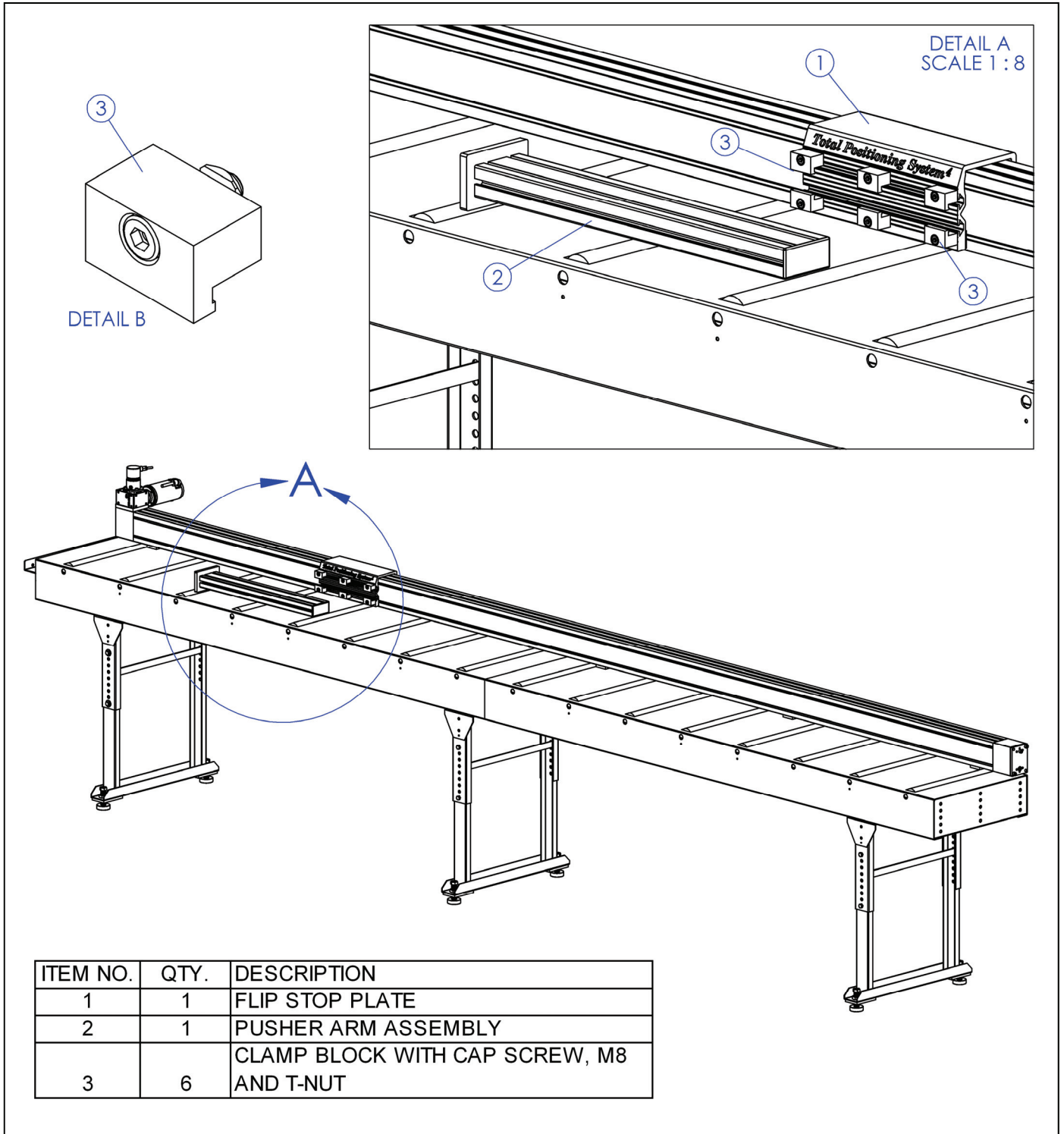
Figure: 4.1
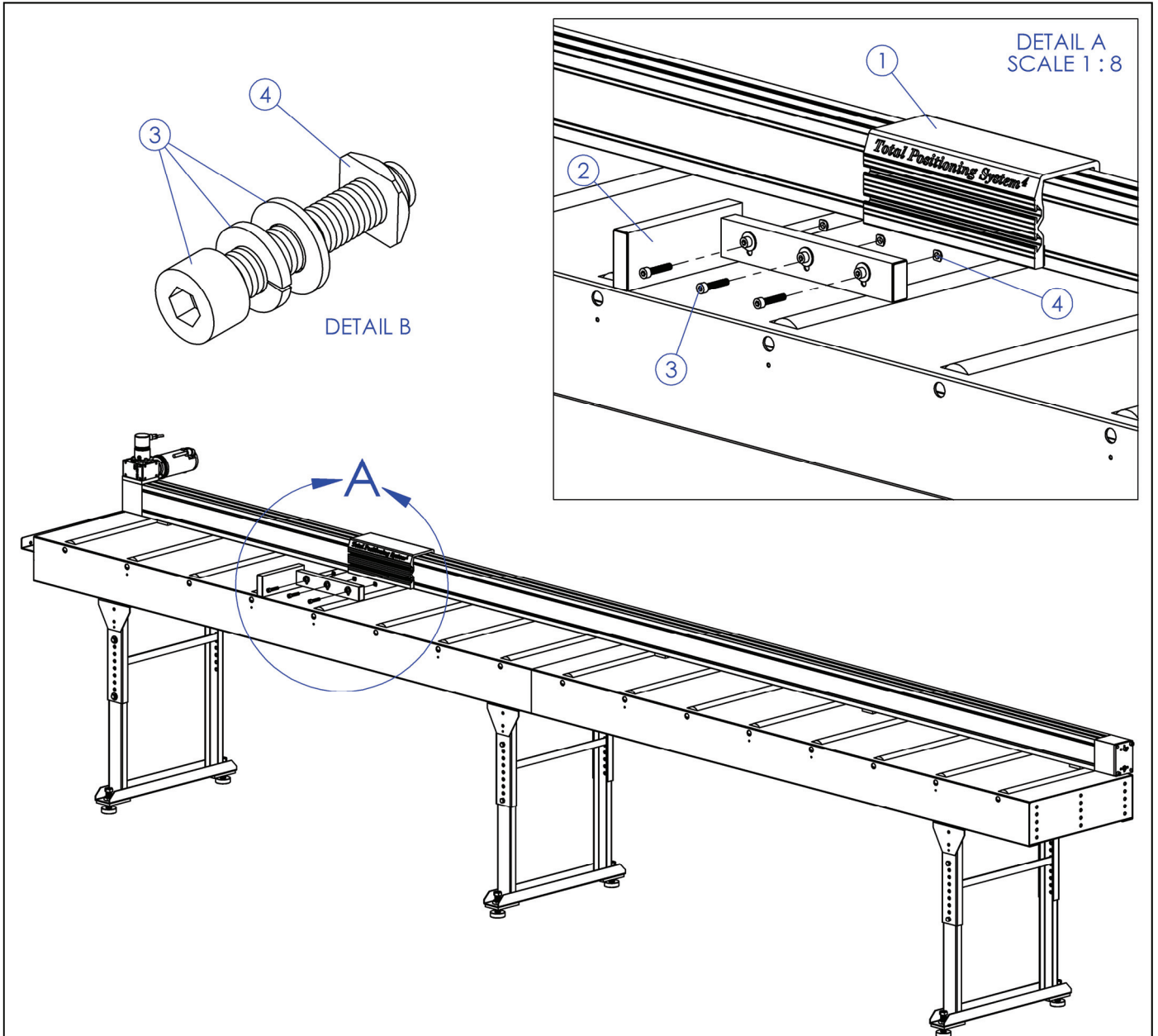
ITEM NO.	QTY.	DESCRIPTION
1	1	FLIP STOP
2	1	GANG STOP ASSEMBLY
3	3	SOCKET HEAD CAP SCREW, M8 X 40 WITH LOCK & FLAT WASHER
4	3	T-NUT, M8

5. Optional Pusher Arm Assembly

Bolt Pusher Arm Assembly to (2) Flip Stop Plate (1) by loosening all the Clamp Blocks (3) and sliding the Pusher Arm (2) onto the Clamps (3) and tighten the Clamp Screws as shown in "Figure 5.1". Make sure the Gang Stop Arm is square to the rail and table.
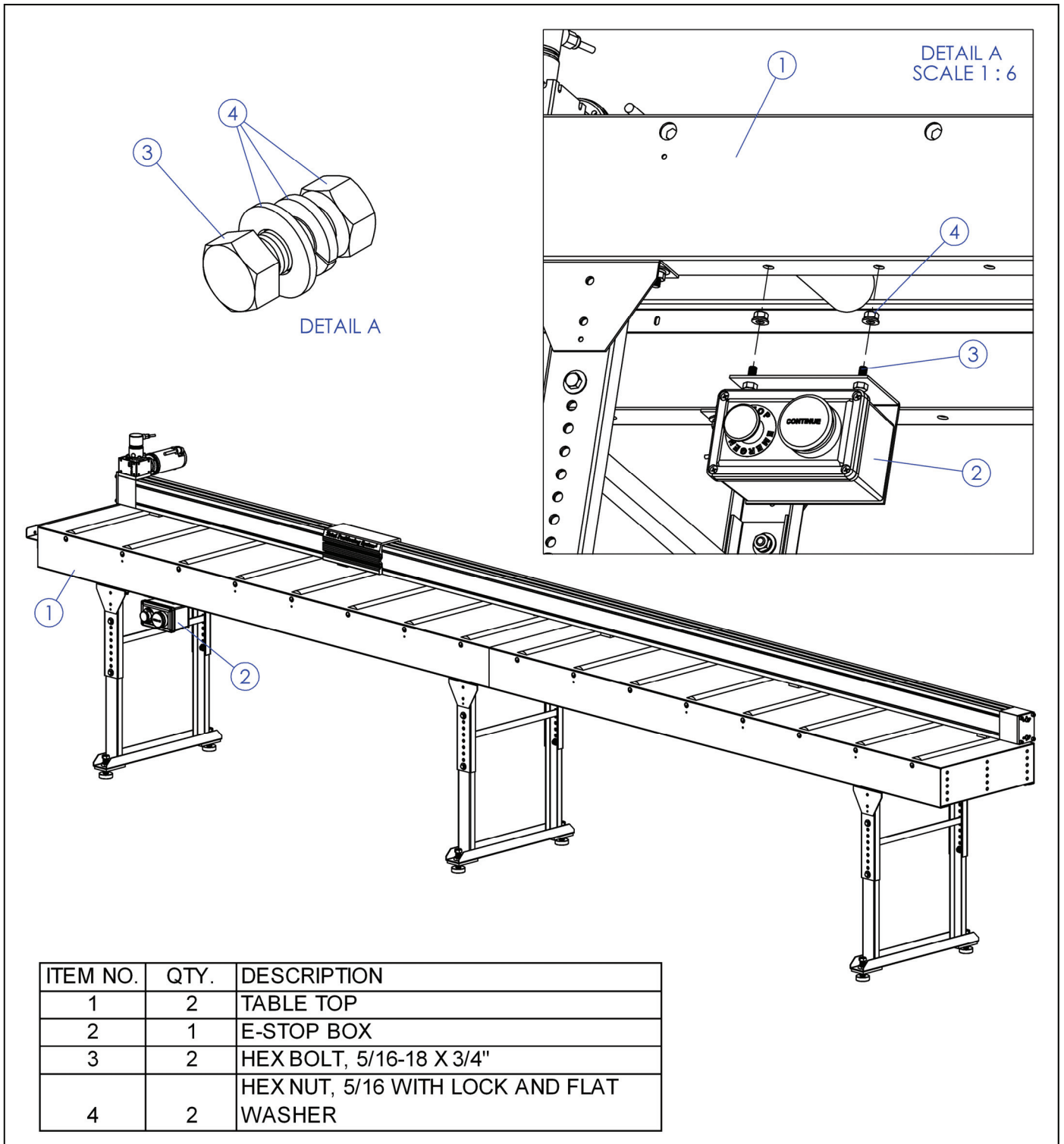
Figure: 5.1

ITEM NO.	QTY.	DESCRIPTION
1	1	FLIP STOP PLATE
2	1	PUSHER ARM ASSEMBLY
3	6	CLAMP BLOCK WITH CAP SCREW, M8 AND T-NUT

6. Emergency & Continue Switch Box

Install E-Stop Box with supplied mounting bracket (2) to under side of table beam (1) as shown in "Figure 6.1" with supplied Mounting Screws (3) and Hex Nuts & washers (4). Mount E-Stop Box (2) in convenient place for operator.
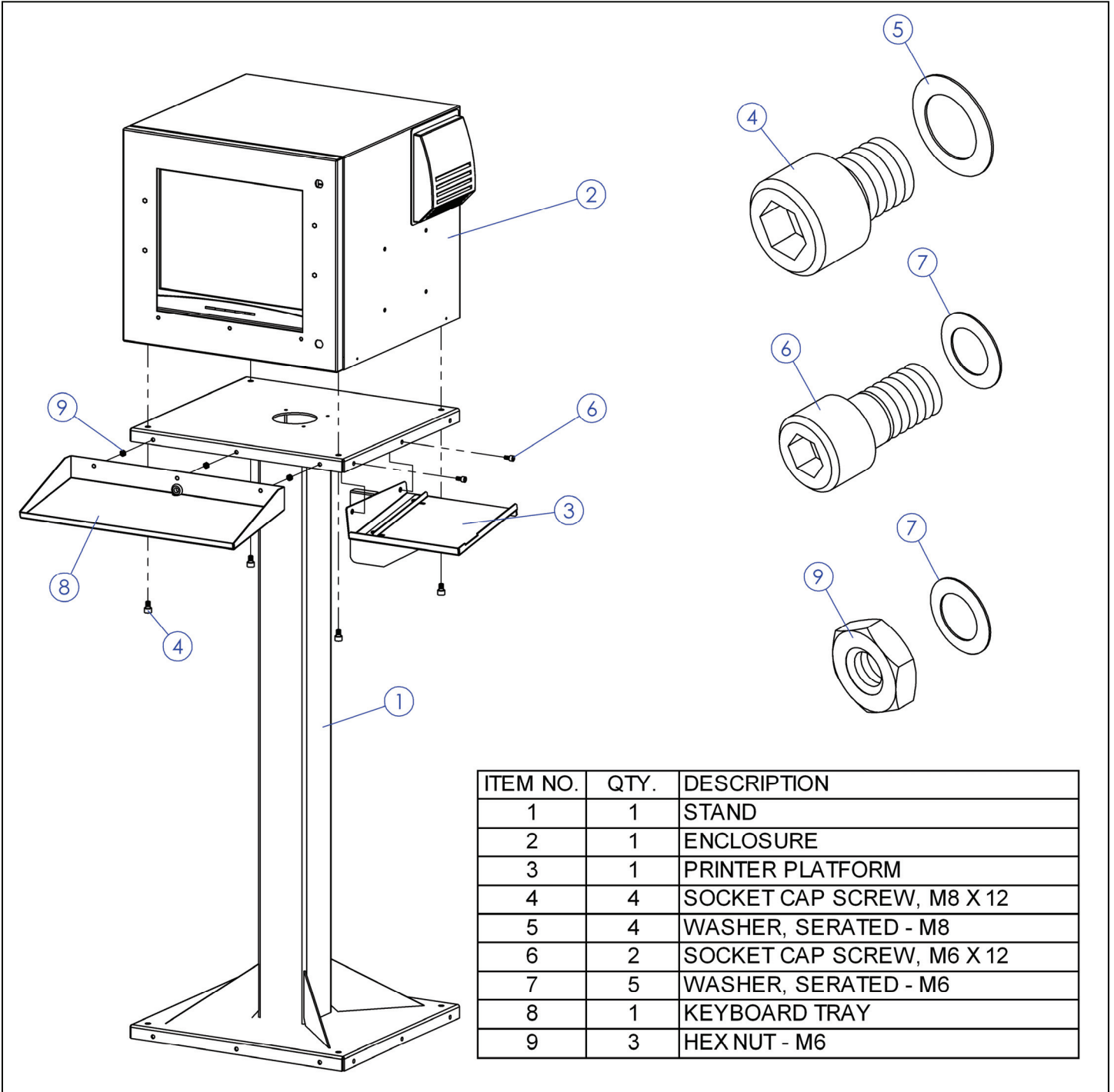
Figure: 6.1

ITEM NO.	QTY.	DESCRIPTION
1	2	TABLE TOP
2	1	E-STOP BOX
3	2	HEX BOLT, 5/16-18 X 3/4"
4	2	HEX NUT, 5/16 WITH LOCK AND FLAT WASHER

7. **Enclosure with Stand Assembly**

Place Enclosure (2) and Printer platform (3) on top of Stand (1) and attach with hardware as shown in "Figure 7.1".

Note: Do not fully tighten screws until all screws have been inserted.

Figure: 7.1

ITEM NO.	QTY.	DESCRIPTION
1	1	STAND
2	1	ENCLOSURE
3	1	PRINTER PLATFORM
4	4	SOCKET CAP SCREW, M8 X 12
5	4	WASHER, SERATED - M8
6	2	SOCKET CAP SCREW, M6 X 12
7	5	WASHER, SERATED - M6
8	1	KEYBOARD TRAY
9	3	HEX NUT - M6

8. System Assembly

Place all components as shown in "Figure: 7.1" for a typical layout.

1. Level Infeed & Outfeed Tables with Saw (4). Align the top of rollers or top of table if using a flat table with top of saw table by adjusting the Leveling Bolts as shown in "Figure: 7.1, Detail-A".

2. Align back fence of saw (4) with front face of TPS4-Positioner Rail (2).

3. Bolt Infeed and Outfeed Tables to Saw with supplied Saw Adapter bracket (see page 9).

4. Anchor Tables and Saw to floor with concrete anchors.

5. Place Computer Enclosure in a convenient position for the operator and bolt to the floor.

6. Connect Motor, Encoder, E-Stop and Saw interface cables to controller in Computer Enclosure (3) as shown on page 16, 17, 18 & 19. Connect power cables to Saw (4) and Computer Enclosure (3).

Figure: 7.1

1	INFEED TABLE, FLAT OR ROLLER
2	TPS4-POSITIONER RAIL
3	COMPUTER ENCLOSURE
4	SAW
5	OUTFEED TABLE, FLAT OR ROLLER
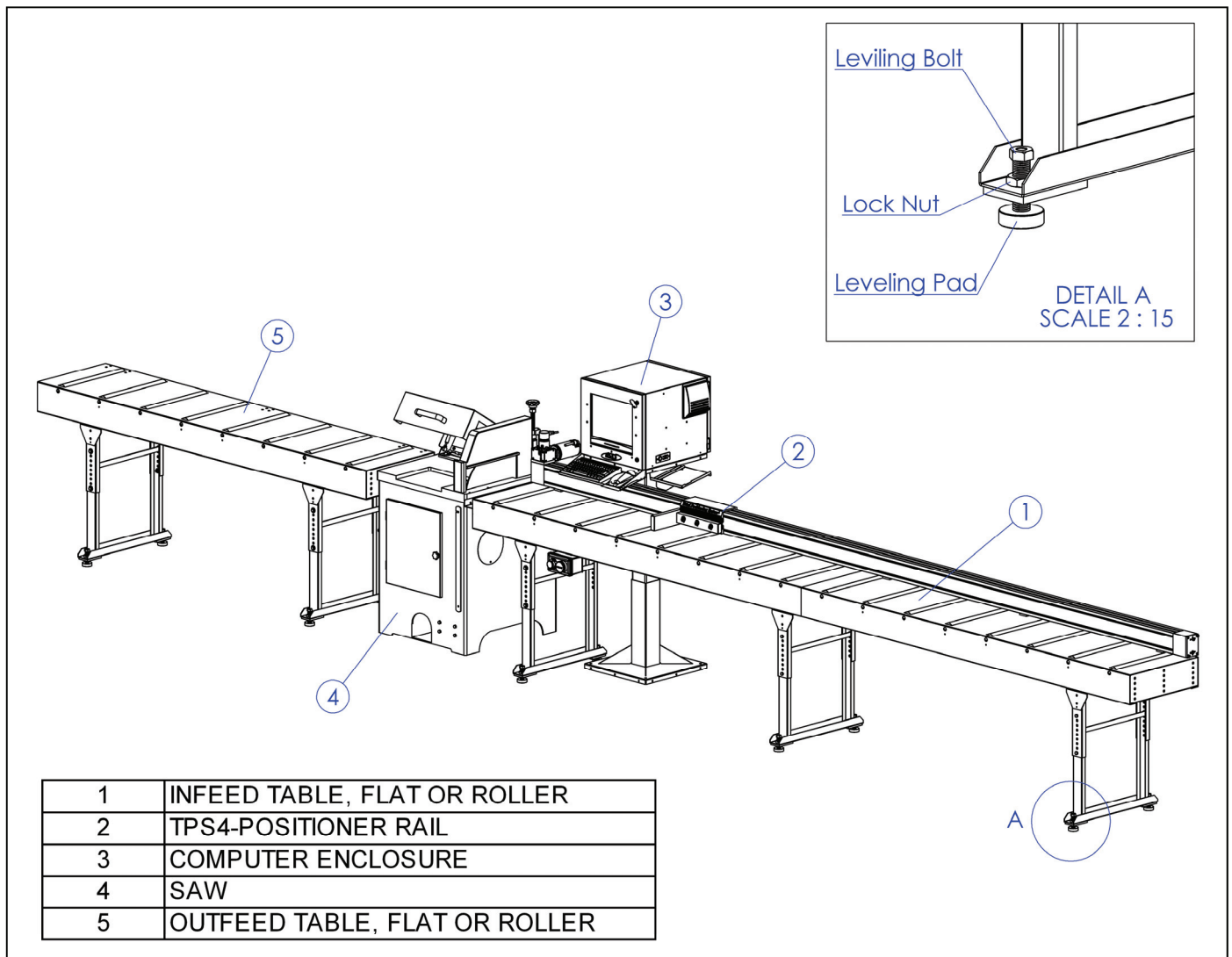
9. Connecting the Controller

A. Serial Controller

B. The serial controller box contains the controller card normally in the PC. The controller box uses the Network Interface Card to transfer data to the PC. The connections for the Controller Box are shown in "Figure: 9.1", respectively.

C. Attach the 5-pin cable on the Emergency Stop Button Box to the Controller Box.

D. The notch on the male connector should be aligned with the corresponding groove on the female connector located on the controller box. Then push the connectors together.

E. The twist cap should be pushed in towards the box and twisted 1/2 a turn until it feels tight and is secured to the box.

F. Check to make sure the emergency stop (red) button is in the "up" (unlocked) position.

Figure: 9.1

10. Setting up the Computer

1. Open the computer and monitor boxes and remove the contents.

2. Select a clean, but convenient place to install the Computer Enclosure, so the operator can easily work with the system.

3. The computer monitor is pre installed from the factory. Place the ATI-Controller and Computer as shown in picture below.

4. Connect all cables from Monitor including the Power, Video & Touch Screen cable.

Warning - Make sure to keep the computer and monitor

Figure: 10.1

11. **Connecting the Cables**

1. Plug the enclosed power cords into the monitor and computer unit, but do not connect them to an outlet at this time.

2. Connect the keyboard cord to the back of the computer unit.

3. Connect the RJ45 Connector of the Communication Cable in to the **IN-Port** on back of ATI-Serial Controller.

4. Connect the Serial (9 Pin) Connector of the Communication Cable in to **COM-1** on the back of the computer.

It is strongly recommended that the computer, monitor, and *Controller Box* be connected to an outlet with a surge protector and/or an uninterruptible power supply (UPS). This will ensure any unwanted power surges or Brownouts will not damage or otherwise adversely affect the positioning unit and computer equipment. Contact ATI & DeMichele Systems, Inc. for more information on purchasing a UPS at (480) 985-4926.

Figure: 11.1
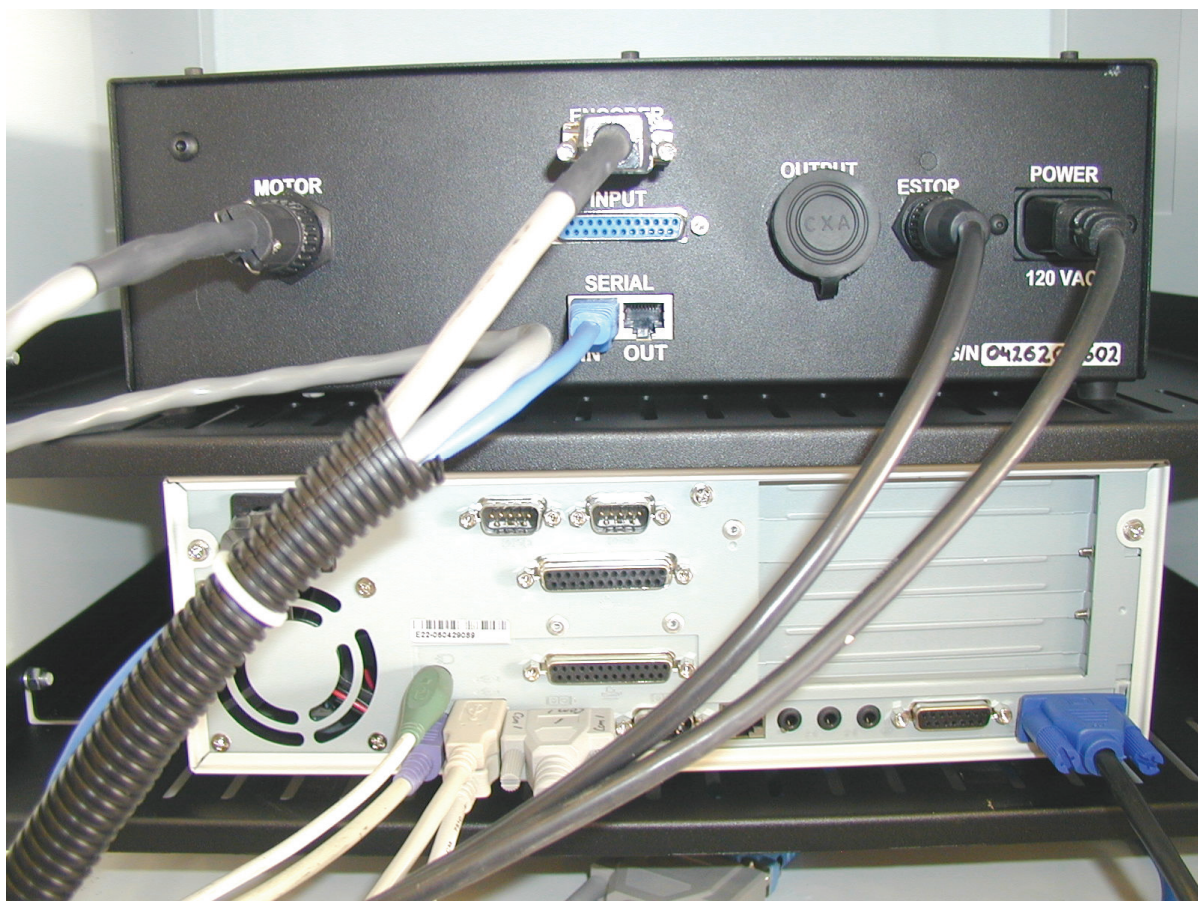
Discontinued Controller

Connecting the Controller

A. Standard Controller

1. The system controller box varies depending on the positioner model ordered. The controller box either will be mounted on the rail or will be packaged as an independent unit. Both controllers perform the same function, but the exact configuration varies depending on customer needs. The connections for the Controller Box are shown in "Figure: 8.1", respectively.

2. Attach the 5-pin cable on the Emergency Stop Button Box to the Controller Box marked as F.

3. The notch on the male connector should be aligned with the corresponding groove on the female connector located on the controller box. Then push the connectors together.

4. The twist cap should be pushed in towards the box and twisted 1/2 a turn until it feels tight and is secured to the box.

5. Check to make sure the emergency stop (red) button is in the "up" (unlocked) position.

6. Attach the male end of the 37-pin cable to the Controller Box marked as D.

Figure: 8.1
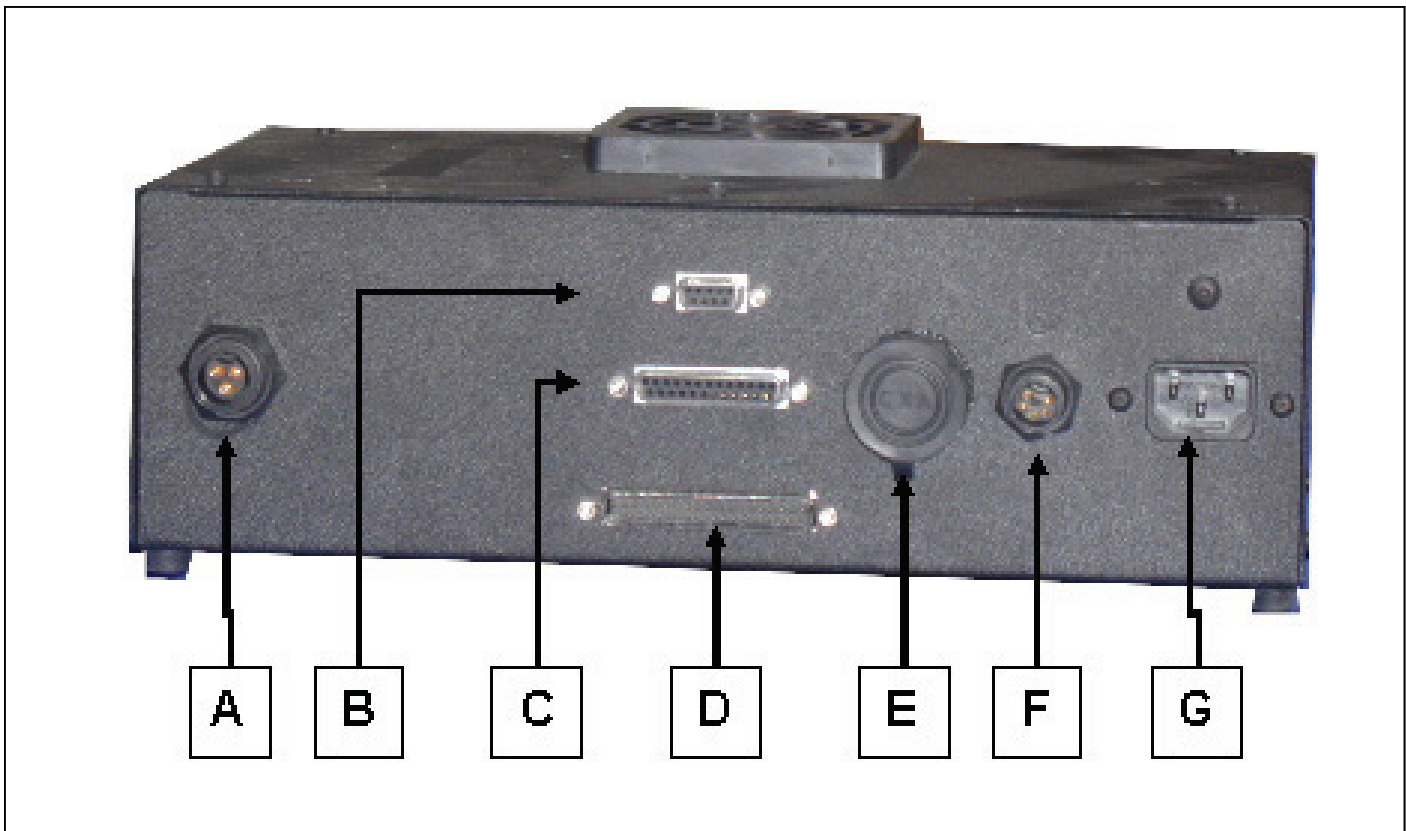
Software Settings and Calibration

Getting Started

After the computer, controller, and positioner rail have been connected as shown in the diagrams, power up the computer, controller, and monitor.   The computer should start to the Windows Desktop.   Locate the TPS icon on the desktop and double-click it to start the program. The software will prompt the user to "home the machine?". If the path is clear of obstructions, select YES. The positioner should begin moving towards the motor end of the rail in search of the home position. The home position is the point at which the shuttle encounters the physical stop at the drive end of the rail.   It is also the minimum position between the saw blade and the end of travel of the shuttle. If the shuttle moved to the far end of the rail (away from the saw), this can be changed by initializing the axis in the Machine Setup.   If the shuttle moved to the correct home position (closest to the saw), the Initialize axis routine may be skipped and the axis is ready for calibration.

Initialize Axis

1.   From the **TPS Main Menu.**

2.   Select **Machine Setup** pushbutton.

3.   Enter *Passkey* and press the **OK** pushbutton.

4.   Select the **Initialize Axis** pushbutton.

5.   Select the **Initialize** pushbutton to set home position.

6.   Did machine go to the home position?

    a. NO – Press the **NO** pushbutton for the machine to home in the opposite direction. Go to step b.

    b. YES – Press the **YES** pushbutton to accept the home position

7.   Cut a piece of scrap and compare measured part to the distance on the screen.

8.   If the size is off, then run the machine calibration.

Calibrate Axis

1.   From the **TPS Main Menu.**

2.   Select **Machine Setup** pushbutton.

3.   Enter *Passkey* and press the **OK** pushbutton.

4.   Select the **Calibrate Axis** pushbutton.

5. Select **Home Position** pushbutton.

    a. Cut a scrap part by placing it against the stop and cutting a part.

    b. Measure the part. The more accurate the measurement, the more accurate the Positioner.

    c. This is the smallest part that can be cut with the Positioner without using a jig tool.

6. Key in the exact size of the part that you measured.

7. Press the **Enter** pushbutton.

8. Press the **OK** pushbutton.

9. Press the **Calibrate** pushbutton.

    d. Cut a scrap part by placing it against the stop and cutting a part.

    e. Measure the part. The more accurate the measurement, the more accurate the Positioner.

10. Enter the length of the part (if different) and select the **Enter** pushbutton.

11. Press the **OK** pushbutton.

12. Press the **Update** pushbutton.

13. Press the **OK** pushbutton to complete the process.

Configuring System Settings

1. From the **TPS Main Menu.**

2. Select **Machine Setup** pushbutton.

3. Enter *Passkey* and press the **OK** pushbutton.

4. Select the **System Settings** pushbutton.

    a. Jig insert tool – this will be called for when a part needs to be cut that is smaller than the distance between the home position of the TPS and the saw. The size that is typed in to this box is the physical size of the jig tool.

    b. Backup – this is the distance the TPS will back up after making a cut. If the TPS is a pusher or a stop, it moves to allow the part cut to be removed.

    c. Safe Zone – this is the distance from the end of each side of the Positioner that the system will stop one extra time to make sure that hands or other objects do not get pinched between the back bracket and the stop slide.

5. The rest of the settings are configured during the calibration process.

6. Press the **OK** pushbutton to accept the changes.

Move Parameters

*These settings should not be adjusted without assistance from the DEMICHELE GROUP. The only thing you should do in this area is note the values of each field in case of system failure or database crash.

1. From the **TPS Main Menu.**

2. Select **Machine Setup** pushbutton.

3. Enter *Passkey* and press the **OK** pushbutton.

4. Select the **Move Parameters** pushbutton.

    a. Home Velocity

    b. Home Strength

    c. Move Velocity

    d. Move Strength

    e. Acceleration

    f. Proportional

    g. Integral

    h. Derivative

    i. I-Limit

    j. Speed Factor

5. These settings are configured at the factory and should not be modified with out the DeMichele Group's assistance.

6. Press the **Ok** pushbutton to complete.

TPS Software

Main Menu

The Main Menu has seven possible pushbuttons for usage:
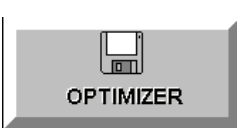
Manual Mode

Pattern Move

Machine Setup

Optimizer

Home Machine

Reports

Exit

Figure 12.1a: Main Menu (All options shown)

Note: The Machine Setup, Reports and Exit are often times hidden from view. (See figure 12.1a) Press the **CTRL** + **ALT** + **A** to unhide these buttons, and **CTRL** + **ALT** + **H** to hide.

Main Menu Controls

Pushbutton	Features
MANUAL POSITION	**Manual Positioning** - Allows the user to manually set the desired position of the equipment.
PATTERN MOVE	**Pattern Move** - Allows the user to develop a library of routine movements or sequences of positions. This feature is used for standard products.
MACHINE SETUP	**Machine Setup** - Provides the user with access to the system control screens. This feature requires a Passkey to operate.
OPTIMIZER	**Optimizer** - Provides the user with access to the system control screens for the TPS Optimizer.
HOME MACHINE	**Home Machine** - Allows the user to automatically move the equipment to the home position. This feature is activated on startup of the machine.
REPORTS	**Reports** - Provides the user with current and cumulative totals for pieces of material cut, physical cuts, stock lengths used, and yields. This feature requires a Passkey to operate.
EXIT	**Exit** - Returns the user to the computer's operating system.

Initial Passkey is "312"

Dropdown Menu Controls

File Dropdown Menu
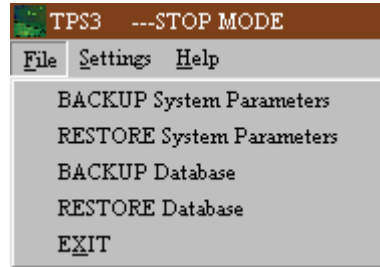
Backup System Parameters - Allows you to backup your current system configuration parameters to a floppy disk or across a network.

Restore System Parameters - Allows you to restore your backed up parameters to the TPS system from floppy or across a network.

Backup Database - Allows you to backup your current database in case of system failure or data loss.

Restore Database - Allows you to restore your backed up database to the TPS from floppy or across a network.

Make Emergency Disk - Used to store or email system critical information.

Exit - Exits the TPS Software.

System Parameters

The System Parameters contain the HOME position, Calibration Value, and other critical system data. System Parameters should be backed up when the system is working properly. The Restore selection will change the system back to the previously saved values.

Settings Dropdown Menu

Figure 12.3

Set Network Path - Allows you to set the network path of where the merge lists will be located. This list can be called from local directories as well as from a mapped network drive.

Set Merge Format - Allows you to set the way the TPS reads the merge file. This option also has a test merge button to make sure that the TPS reads the files properly.

Options - Allows you to configure how TPS controls options like Optimization, Printer Labels and other options.

Network Path

If the user has a cut list that has been prepared outside of the TPS program or on another computer, they can import it using the Merge List button in the Cut List Menu. The retrieval path for the imported lists can be set from the **Set Network Path** selection in the Settings drop down menu (Figure 12.3). A window will open in which the user can enter the drive and directory for merge files (Figure 12.4).
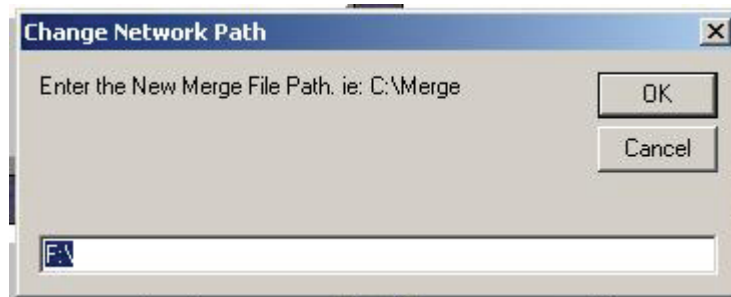
Figure 12.4: The Change Network Path Screen

Options

Options are for custom configuration of the TPS software.

Figure 2.4a Options Menu (Must key in the Passkey)

Company Name: Field for the company name.   Commas are not allowed in the company name field.   For example, the company name should be **Joe's Glass Inc.** whereas **Joe's Glass, Inc.** would cause a program error and is not allowed.

Network Address: The network address of a mapped drive containing the cutlist. This is typically a shared folder on a company's file server which is used to store the cultists. The shared folder must be mapped to a physical drive letter on the TPS computer.   The network address could also be the drive letter of a removable storage device, such as a USB flash memory stick that is used to transfer the cutlist from the office computer to the TPS computer.

Demo mode: Disables the TPS servo controller so that the software can be used with no controller attached.   Useful for training or in test situations where it is undesirable for the rail to move or where no controller is present.   Demo mode can also be toggled from the main menu by using the keystroke sequence CTRL-ALT-D

Enable High Security: If this feature is enabled, a password is required for the user to exit the TPS program. This is useful to prevent the user from shutting down the TPS program without authorization.

Optimize: Enables the stock length optimizer.   The optimizer will re-sequence the parts in the cutlist to achieve the highest possible yield from the stock lengths for the given number of parts to be cut.   If this option is not checked, the cutlist will only be displayed in "list order".   In other words, the list will be displayed in the order in which it was entered, with each piece fit into a stock length until the stock length is utilized as best as possible.

Trim Flag: Forces a trim cut to be made and the trim cut to be acknowledged when the positioner is configured in pusher mode.

Print Labels: Enables the label printer.   The label printer is sold as an optional accessory for the TPS system.   The part Label contains information such as material type, part length, job name, bin storage location, frameset location (panel / row), finish, and remarks. A part label is only generated when running from a cutlist in the optimizer screen.

Units: Changes the display from English to Metric units.

Options available in the Level 2 software

Enable Reporting: Enables the production report tracking of the parts cut and the cumulative yield.

Enable drop tracking: Tracks the drops used and stored in the drop bins.

Cut drops first: Calls for the drops at the beginning of the run.   After the drops have been cut the full stock lengths will be called for.

Absolute Fabrication Values: Fabrication values are specified in absolute value from an origin, as opposed to relative to one another. The positioner typically runs in Absolute mode, so this option should normally be enabled.

Inventory Control: Enables tracking of stock length quantities used while cutting. When this option is enabled, the inventory is depleted from the STOCK drop bin in the drop bin configuration.

Cannibalize Overview

Over time, the drop bins often accumulate a small number of long drop lengths and a large number of short drop lengths. Longer length drops are generally beneficial, since they are more likely to be used in future optimization runs with a high yield.   Shorter drops often accumulate because it is more difficult for the optimizer to achieve a high yield on a short part.   This is due to the fact that only a small number of pieces can usually be cut from a short drop.   The cannibalize feature is designed to be used periodically to clear the drop bins of these shorter parts.

Cannibalize options

Maximum Drop Length: The maximum length of a drop to consider using for a cannibalize optimization.   The maximum drop length field allows the user to tell the optimizer to limit the cannibalize optimization to only those drops that are shorter than the maximum length specified. By doing this, the cannibalize optimization can clear out the short parts from the drop bin.   For example, a drop bin might contain a few parts longer than 100" and a large number of parts shorter than 100".   Specifying a maximum drop length of 100" forces the cannibalize optimizer to use only those parts shorter than 100" as long as the minimum acceptable yield value is met.

Minimum acceptable yield: The minimum yield value for a cannibalize optimization run. Specifying a low minimum acceptable yield results in high consumption of the drop inventory since drops will be used even when the optimization results in poor stock yield.   For example, a 50% minimum acceptable yield would allow a 51" part to be cut from a 100" drop since the yield is 51%. The remaining 49" would either be considered a drop or scrap, depending on the minimum drop length setting for that part in the drop bin material settings.

Merge file

Merge File Format

The format of cut lists often varies depending on the manufacturer. Because of this, TPS makes it possible to define the format for merged lists via the **Set Merge Format** selection in the Settings drop down menu. A **Merge File Format** window (Figure 12.5) will open allowing the user to define the structure of the imported cut list.

Merge File Format Display Window

Figure 12.5 Merge File Screen

Delimited / Fixed Length Fields – This window displays the field size settings for imported cut lists. If the fields are delimited this means that the imported cut list information will have some type of separator such as a comma or backslash between field data. In this instance, the type of separator (delimiter) must be specified. If the fields are of fixed length then there will be no separator between field data. In this instance, the length of each data field will need to be specified by the user. Selecting the field type can be done with the down arrow at the right end of the display window.

Delimiter Type – This window will be displayed only if the Delimited Fields selection is active. It contains several common separator types that can be scrolled through using the down arrow at the right end of the display window. If the necessary separator type is not in the list, it can be typed directly into the window using the keyboard.

Note: Normally, no two fields should have the same value; each material parameter should come from a different position in a merge list.

File Extension – This window contains a list of common merge file extensions. The down arrow at the right end of the window allows the user to scroll through the list. If no particular extension is required the "*.*" selection will allow the system to display all file types. If the required file type is not listed in the window list, then the user can enter an extension using the keyboard.

Test Merge Fields – These windows contain the material parameters that have been extracted from a merge list. If all of the windows display the correct parameter information then the test was successful.

Merge List Display – This window is located above the Cancel and Done buttons and will display the merge list in its raw form. With this window, the user can see if the list is delimited and what the separators are.

Machine Number – This window allows the user to specify the machine number for the current merge. If the user is working with a merge file with multiple machine data, the machine number can be specified allowing only machine specific data to be merged.

Delete Files After Merge – This check box allows the user to automatically remove merged files from the merge path once they have been successfully merged.

Assign Bin Numbers — This option will automatically assign a bin number to store the cut parts if one is not present in the merge data.   If the bin is a grid configuration, the number of rows and slots can be defined by typing the number into the box.

Help Dropdown Menu
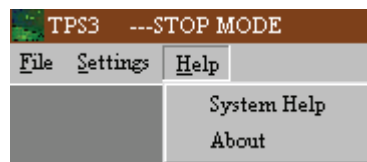
Figure 12.6 The Help Menu

System Help - Opens the electronic manual allowing you to use these instructions on the computer.

About - This option gives information for the version number of the product.

Manual Mode

Manual mode — Manual mode is used to manually enter a cut length. Select the correct part so that any offsets associated with the part are accounted for in the overall length. Then select the number of pieces to be cut in the REPEAT filed and enter the length to be cut in the Enter Position field. Press START to begin moving to the desired position.
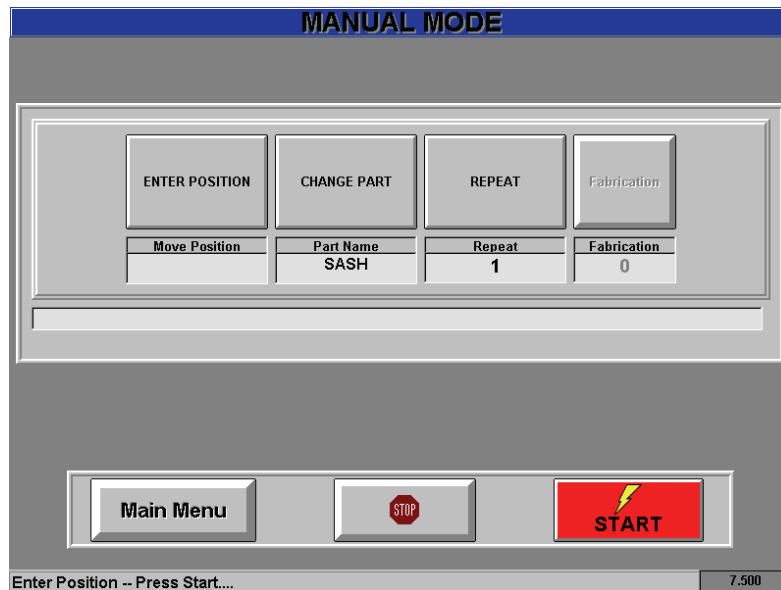

Figure 12.7 The Manual Mode Screen

Enter Position – The Enter Position pushbutton allows you to key in the distance for each move as you work. To use, press the Enter Position button and use the on screen keypad to enter the distance of the move.

Change Part – The Change Part button allows you to change the part being used. This is used when different material parameters are used. See figure 12.8

Repeat – The Repeat button allows you to key how many times you would like to repeat the manual move. You can select between 1 - 999. The repeat counter decreases by 1 part each time the continue button is pressed. This allows the operator to keep track of how many parts are left to cut at any given time.

PART NAME	STOCK SIZE	KERF	OFFSET	TRIM	MULTIPLES	MULTIPLIER	MATCH PART
52-2801-BEI	192	4.3625	0	2	1	1	
52-2801-WHT	192	4.25	0	2	1	1	
52-2901-BEI	206	0.25	0.032	0.5	1	1	
52-2901-WHT	206	4.3625	0.032	2	1	1	
52-2902-BEI	206	4.3625	0	2	1	1	
52-2902-WHT	206	4.3625	0	2	1	1	
52-4012-WHT	206	4.3625	0	0.5	1	1	
52-8503-WHT	192	0.125	0	1	1	1	

SEARCH   ADD   COPY   DELETE

52-4012-WHT

SELECT PART
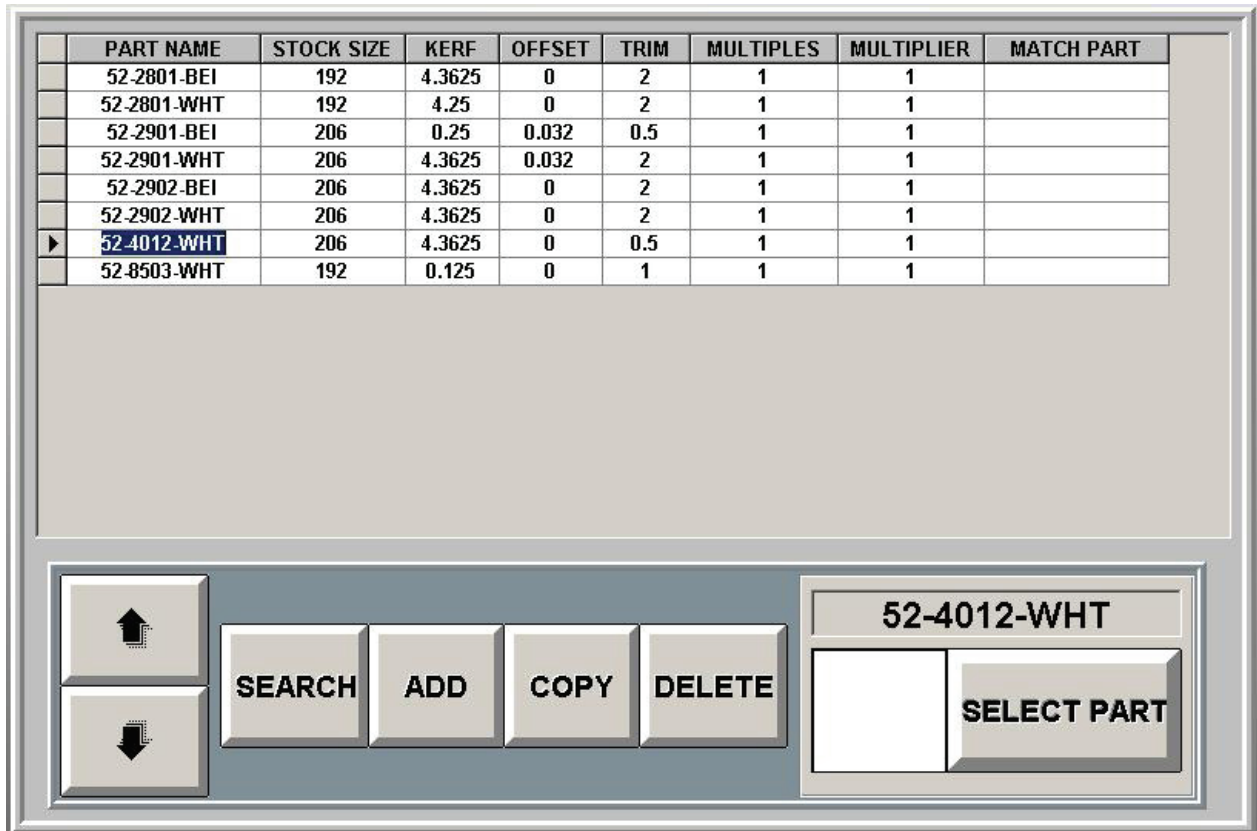
Figure 12.8 Change Parameters

Using Manual Mode

1. Press the **Manual Positioning** pushbutton from the Main Menu screen.

MAKING A MANUAL CUT

1   From the MANUAL MODE menu.

2   Enter the Part and Repeat information, then use the Keypad to enter the move position.

3   Press the **red** "START" button. The "START" button will turn **green** as the position moves to the specified location.

4   Wait until the positioner has come to a complete stop.

5   Put the material to be cut against the fence and the gang stop, then cut the material.

Emergency Stop and Continue Buttons

Emergency Stop/Continue Box Controls

Figure 12.9 The Emergency Stop \ Continue Box

Emergency Stop – The Emergency Stop button must be used any time the system has to be shut down immediately. For example, if the system jams for any reason or is moving in an erratic manner the Emergency Stop button prevents the motor or other components from being damaged.

Continue – The Continue button allows the user to notify the system that a cut has been made. Once the Continue button has been pressed, the system moves to the next length in any list.

Pattern Mode

Pattern Mode Controls
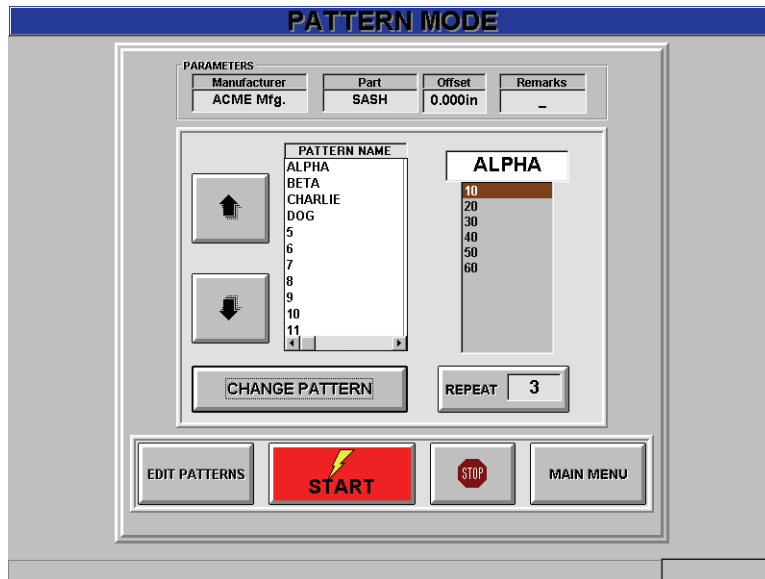
Figure 13.0 The Pattern Mode Screen

Pattern Mode Display Window

Parameters

Manufacturer – This window displays the manufacturer's name. It can be edited from the Settings | Options Dropdown from the Main Menu.
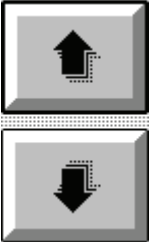
Part Number – By selecting this area of the Parameters box, the user is allowed access to the Material Selection Menu. Here the user can search through a list of parts or add a new part to the list.

Offset –This allows the user to adjust the offset between the stop and the cutting blade. This field is also edited through the Material Selection Menu.

Pattern – This displays an ordered list of cut lengths.

Change Pattern – This allows you to change the pattern being used.

Pattern Mode Controls

Pushbutton	Function
REPEAT 999	**Repeat** – This allows the user to enter the number of times the selected pattern can be repeated by using the remote Continue button located next to the Emergency Stop button on the button box. Pressing the repeat key brings up the number pad. The number of repeated patterns can also be edited directly in the display window.
CHANGE PATTERN	**Change Pattern** –This allows the user access to the Add/Edit Pattern Menu. A passkey is necessary to access this area.
Main Menu	**Main Menu** – This returns the user to the Main Menu.
↑ ↓	**Up & Down Arrows** – These arrows allow the user to scroll through the patterns in memory.
START	**Press to Start** – This initiates the cutting of the selected pattern. The user must press the remote continue button after each cut to set the next length.
STOP	**Stop** – This stops the system at its current position. The Press to Start key will resume normal operation.

Using the number pad
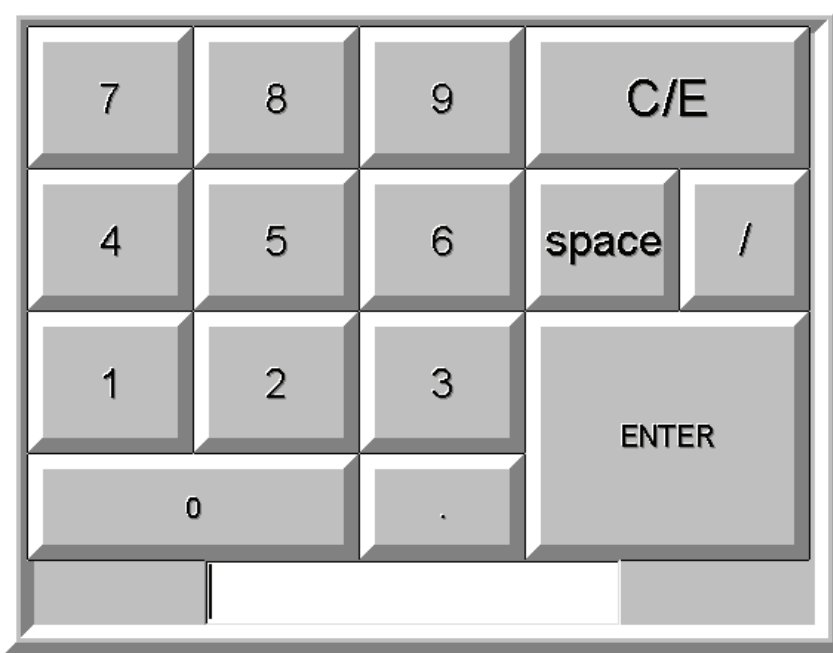
Figure 13.1 The Touch Screen Keypad

Press the appropriate numbers and press the enter key to finish.

Optimization

Overview

Cutting material from a cutlist is fast and easy with the TPS system.   A cutlist can be created with any number of simple or advanced office programs.   Examples of programs that can be used to create a cutlist are a text editor, Microsoft Excel, PartnerPak, or E-Partners.   Using a cutlist greatly reduces the likelihood of an error caused by mis-typing a part name or length.

To use a cutlist created with another program, the first thing that must be done is to verify that the Merge File settings are properly configured. This is done through the main menu, Settings, Set Merge Format screen.   The Merge Format settings only need to be configured once.   After the merge file settings are properly configured, the cutlist can be merged in.   The cutlist is merged in under the Optimizer, Merge Cutlist button. Once the cutlist has been merged from an external storage device, it resides on the local computer until deleted.   If the same cutlist can be used for repeat jobs, it can be recalled later, the cut quantities zeroed out, and it can then be run again.

Once merged, the cutlist can be reviewed, or the user can select "start cutting".   If there is more than one extrusion type in the list, the user must select the extrusion that is to be cut. Once the extrusion has been selected, use the Select Part button to begin cutting.

The Level 2 software allows the user 3 additional optimization options.   By default the optimizer will choose the stock parts as the material source.   At the Select Part screen, the user can select if drops should also be considered for the optimize run in addition to the stock parts, or if a cannibalize optimization should be performed to clear out the drop bins of short parts.

Over time, the drop bins often accumulate a small number of long drop lengths and a large number of short drop lengths.   Longer length drops are generally beneficial, since they are more likely to be used in future optimization runs with a high yield.   Shorter drops often accumulate because it is more difficult for the optimizer to achieve a high yield on a short part.   This is due to the fact that only a small number of pieces can usually be cut from a short drop.   The cannibalize feature is designed to be used periodically to clear the drop bins of these shorter parts.

If the optimizer is enabled, the parts to be cut will be optimized at this time.   The user must select the START button to enable the positioner to move to the first position in the cutlist.   Once the first part has been cut, the positioner can be advanced to the next part in the cutlist by using the black CONTINUE button on the button box or by pressing the ENTER key on the keyboard.   When the last part in the list is complete, the program will return to the SELECT PART screen until all the parts have been cut.

TPS Optimizer Window Displays

Figure 13.2 The Optimizer Screen

Material Parameters

Name – This field displays the name of the current part. Selecting anywhere within the gray area of the window displays the Material Selection Menu.

Finish – This field displays the color of material to be used.

Quantity – This field displays the amount of product needed for this part, finish, and size for this order.

Cut – This field displays the amount of material already cut.

Length – This field displays the size of the cut needed.

BIN - This field displays the bin assignment for the cut(s).

Order - This field displays the order number for the product being built.

Remarks - This field displays any special remarks for the product.

Optimizer Controls

Stock Size – This field displays the length of the available stock.

Trim – This field displays the amount of material that must be trimmed from the stock to create a usable length.

Multiples – This field displays the number of parts that can be cut at one time by stacking the material.

Length – After optimization, this window displays a reordered list of lengths to be cut. If the optimization option has been disabled, the list will appear as it was written.

Qty – This window displays the quantity of each length being cut at one time. This depends upon the value in the multiple fields described above.

Bin – This window displays the name of the storage bin that will hold a particular length.

Remarks – This window displays any special comments for the system operator.

Min Length – This field displays the minimum length of the stock part before it is considered waste.

Drop – This field shows the length of the stock left over after cutting. This value along with its Bin location is stored in memory and the system notifies the operator if the piece can be retrieved and used in a later optimization.

Yield – This field shows the percentage of used material for each pattern.

Pattern – This field shows the current pattern number and the total number of patterns.

Position – The top half of this window displays the desired position according to the pattern list. The bottom half of the window displays the current position. The background is red when the current position differs from the desired position and the background is green when the machine has completed the move.

TPS Optimizer Button Controls

Pushbutton	Function
PREV NEXT	**Previous \ Next –** This button allows the user to jump to the next or previous patterns.
⬆ ⬇	**Up & Down Arrows** – These arrows allow the user to scroll through the length list.
LIST MENU	**List Menu** – This button allows the user access to the List Menu (Figure 13.2) The list menu has buttons to Merge, Select, Edit, or Create a Cut list.
◀ MAIN MENU	**Main Menu** – This button returns the user to the Main Menu.
Press to Start	**Press To Start** – Once this button is pressed the system moves to the first position on the current list. After cutting, successive moves can be initiated by pressing the remote continue button.
STOP	**Stop –** The stop button stops the system from continuing with the current pattern.

Cutlist Menu
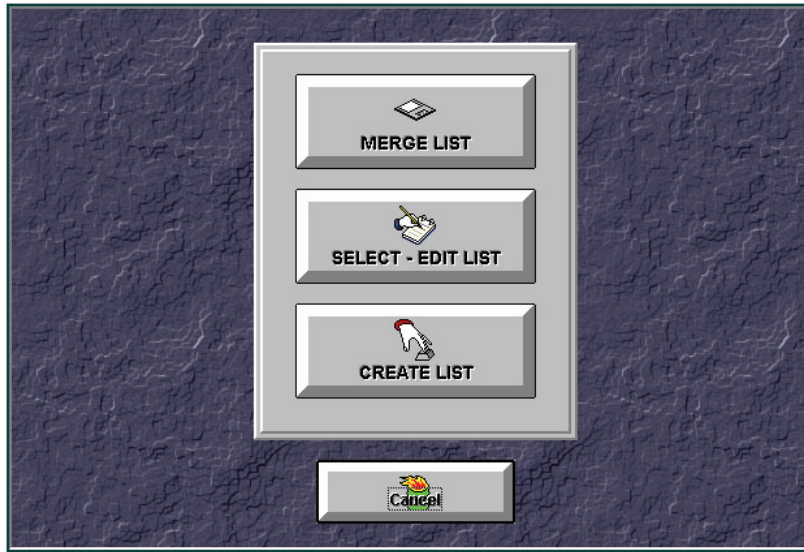
Figure 3.3 Cutlist Main Screen

Cutlist Menu Controls

Pushbutton	Function
	Merge Cutlist: Allows the user to merge in a cutlist file from an external data source, and stores the cutlist into the TPS program database on the local computer. The cutlist file can be merged in from any accessible drive, such as the floppy drive, USB flash drive, or network server drive.
	Select / Edit Cutlist: Allows the user to select or edit a cutlist that has already been merged into the database. A previously merged cutlist will be stored on the local computer until it is deleted by the user.
	Create Cutlist: Allows the user to manually enter a cutlist.

Merge Cutlist Menu
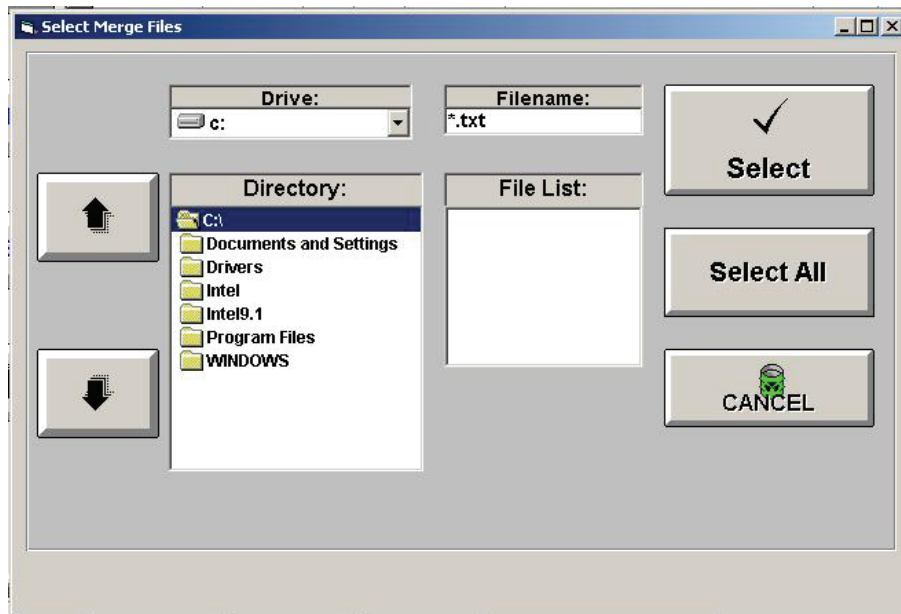
Figure 13.4 Merge Cutlist Screen

Merge Cutlist Screen: Select the Drive location where the cutlist is to be merged from. A list of files matching the cutlist file extension will be displayed. Choose the correct file or use Select All to choose the group. The files will be merged into the computer and the cutlist will be displayed when the merge process is finished.

Select Cutlist Menu
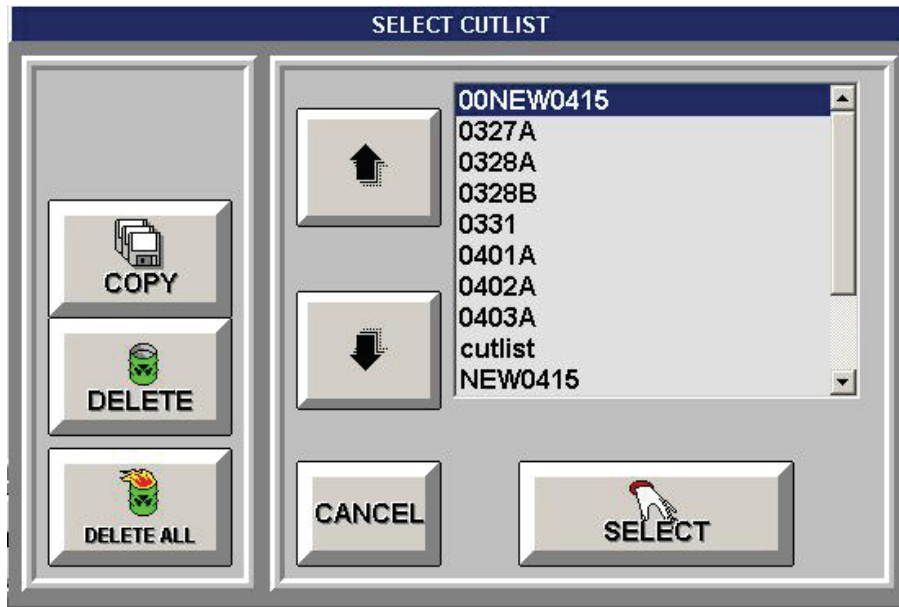
Figure 13.5 Select Cutlist Screen

Select cutlist screen: Displays the stored cultists that have been previously merged.   A stored cutlist can be selected and re-cut, or a previously unfinished cutlist can be selected and resumed. If selecting a previously completed cutlist, the CUT field must be re-zeroed by double clicking anywhere in the CUT column. The user will be prompted to reset the cutlist (yes/no).

Edit Cutlist Screen

	NAME	FINISH	QTY	CUT	LENGTH	BIN	ORDER	REMARKS
▶	50-8735-WHT ▾	WHITE	1	0	32.75	A 1A	12048691.1.1	99|123561|
	52-4001-WHT	WHITE	2	0	32.313	A 1A	12048691.1.1	99|123561|
	52-4002-WHT	WHITE	1	0	31.375	A 1A	12048691.1.1	99|123561|
	52-4003-WHT	WHITE	1	0	31.375	A 1A	12048691.1.1	99|123561|
	52-4010-WHT	WHITE	1	1	32.75	A 1A	12048691.1.1	99|123561|
	52-4012-WHT	WHITE	2	2	11.875	A 1A	12048691.1.1	99|123561|
	52-4004-WHT	WHITE	2	0	15.375	A 1A	12048691.1.1	99|123561|
	52-4005-WHT	WHITE	2	0	15.375	A 1A	12048691.1.1	99|123561|
	52-4006-WHT	WHITE	1	0	29.625	A 1A	12048691.1.1	99|123561|
	52-4007-WHT	WHITE	1	0	29.625	A 1A	12048691.1.1	99|123561|
	52-4008-WHT	WHITE	1	0	30.031	A 1A	12048691.1.1	99|123561|
	52-4009-WHT	WHITE	1	0	30.031	A 1A	12048691.1.1	99|123561|
	50-8735-WHT	WHITE	1	0	32.75	A 1B	12048691.1.2	99|123561|
	52-4001-WHT	WHITE	2	0	32.313	A 1B	12048691.1.2	99|123561|
	52-4002-WHT	WHITE	1	0	31.375	A 1B	12048691.1.2	99|123561|
	52-4003-WHT	WHITE	1	0	31.375	A 1B	12048691.1.2	99|123561|
	52-4010-WHT	WHITE	1	1	32.75	A 1B	12048691.1.2	99|123561|
	52-4012-WHT	WHITE	2	2	11.875	A 1B	12048691.1.2	99|123561|
	52-4004-WHT	WHITE	2	0	15.375	A 1B	12048691.1.2	99|123561|
	52-4005-WHT	WHITE	2	0	15.375	A 1B	12048691.1.2	99|123561|
	52-4006-WHT	WHITE	1	0	29.625	A 1B	12048691.1.2	99|123561|
	52-4007-WHT	WHITE	1	0	29.625	A 1B	12048691.1.2	99|123561|
	52-4008-WHT	WHITE	1	0	30.031	A 1B	12048691.1.2	99|123561|

00NEW0415

LOAD LIST   NEW LIST   CANCEL   EDIT DROPS   START CUTTING

Figure 13.6 Edit Cutlist Screen

This screen is a preview of the entire list to be cut.   Any changes to be made to the cutlist prior to cutting can be done at this screen.   If this is a cutlist that has already been cut and is to be re-cut, the CUT quantity field can be zeroed by double-clicking anywhere in the CUT column.

Load List: This button allows the user to load a different saved cutlist.

New List: This button allows the user to create a new cutlist.

Cancel: Cancels and exits the cutlist editor screen

Edit Drops: This button is available in the level 2 software version.   This allows the user to edit the drop bins to add or remove drops that may be used during this production run.

Start Cutting: This button is used to accept the cutlist as it is displayed and begin cutting.

Select Part Menu
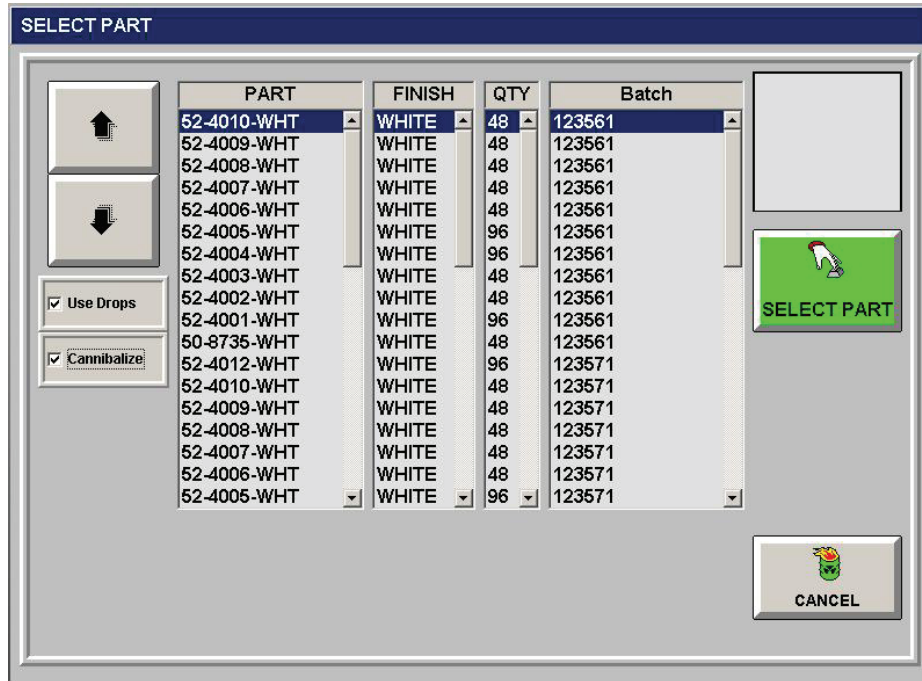
Figure 13.7 Select Part Screen

Select Part Screen: Use the up / down arrow buttons to select the part to cut.   The outline of the part will be displayed in the picture box in the upper right hand corner if the DXF drawing of the part is saved in the DIES folder.

The Level 2 software includes option boxes to enable the use of drops or to cannibalize the drop bins.

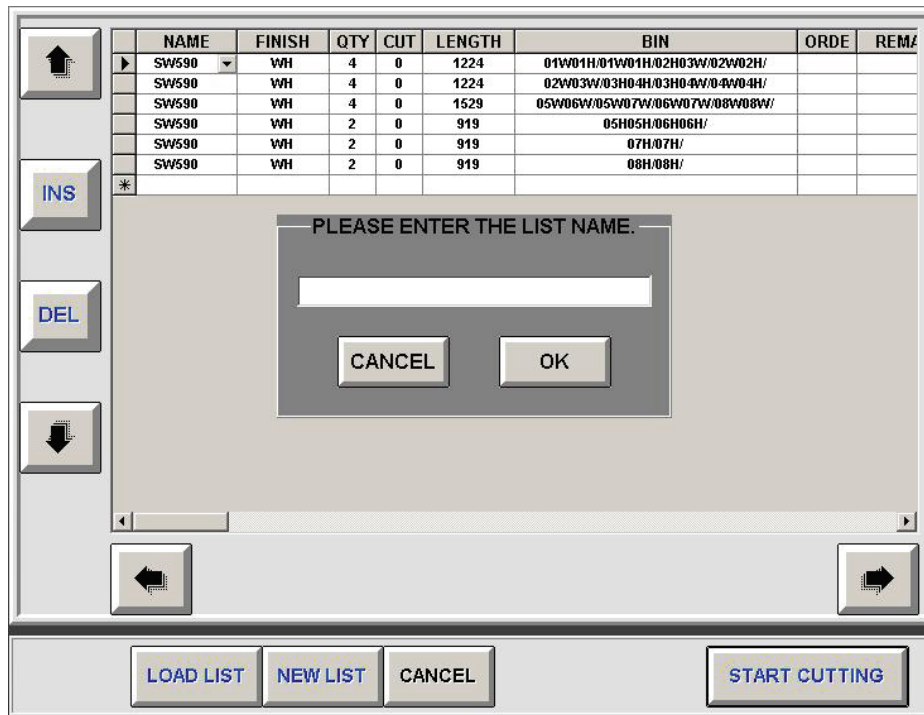Pressing the Select Part button begins the optimization.

Create Cutlist Menu

Figure 13.8 Create Cutlist Screen
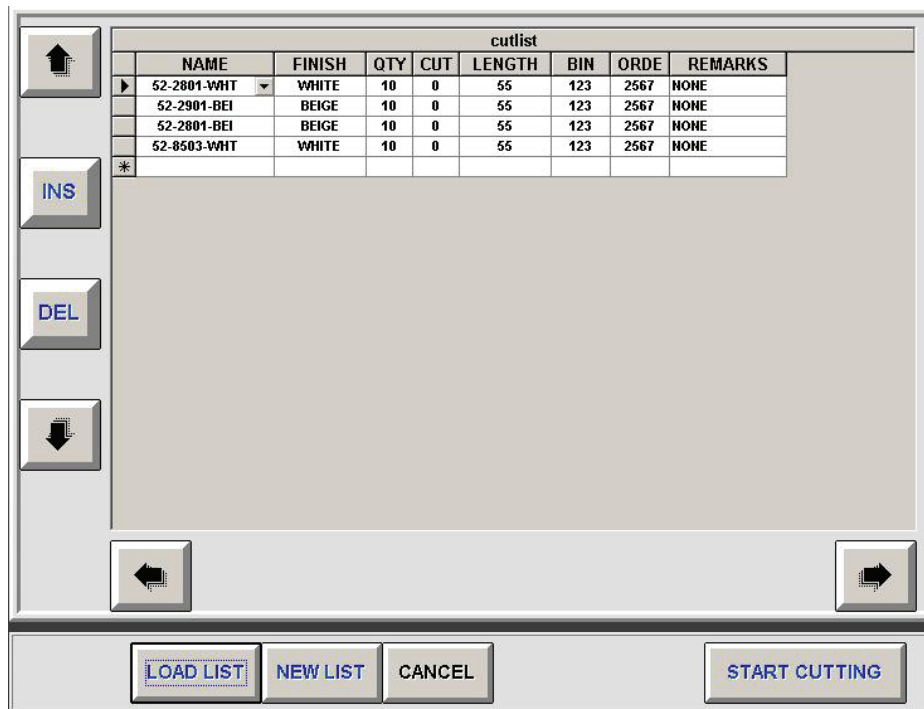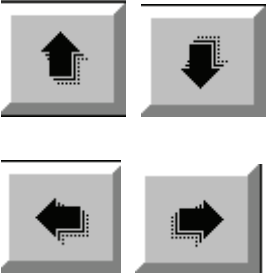
Figure 13.9 Create Cutlist Screen

Create cutlist screen: The user is prompted to enter the name of the cutlist. After the name is entered, the cutlist can be built line by line by filling in the worksheet.

Cutlist Menu Controls

Pushbutton	Function
	Up, Down, Right, and Left Arrows – These arrows allows the user to navigate through the cells of the Cutlist. The Down arrow will also add a copy of the last row when it reaches the bottom of the list.
	Ins – The Insert button allows the user to add a copy of the last row onto the bottom of the list. This row can then be edited to reflect the new part parameters.
	Del – The Delete button allows the user to remove rows from the list. The user must first highlight a row by selecting the gray leftmost cell and then hit the Delete button.

Machine Setup Controls

Machine Setup Main Menu
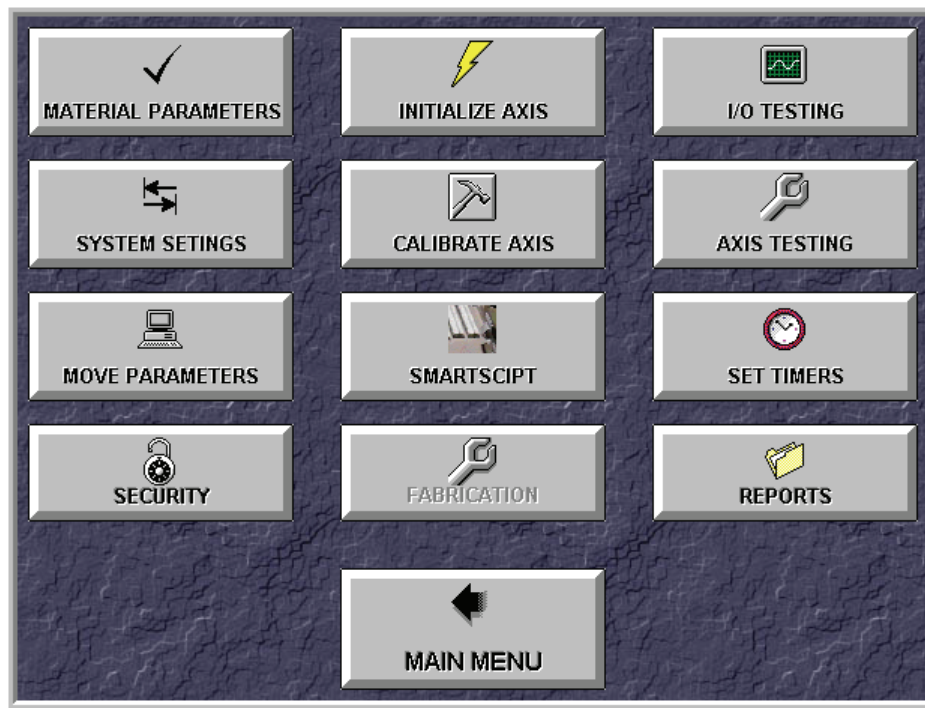
Figure 14.0 Machine Setup Screen

Machine Setup Menu Button Controls

Pushbutton	Function
MATERIAL PARAMETERS	**Material Parameters** – This allows the user access to the Material Selection Screen (Figure 14.0), where material parameters can be created, edited, and deleted.
SYSTEM SETTINGS	**System Settings** – This allows the user access to the System Settings screen (Figure 14.0). Here, machine and positioning dimensions can be altered manually.
MOVE PARAMETERS	**Move Parameters** – This allows the user access to the Move Parameters screen (Figure 14.0) for fine-tuning of the system's movement characteristics.

Pushbutton	Function
SECURITY	**Security** – This allows the user to change the default passkey "312".
INITIALIZE AXIS	**Initialize Axis** – This allows the user to automatically initialize the minimum and maximum spacing values for the current axis.
CALIBRATE AXIS	**Calibrate Axis** – This allows the user to run the calibration routines.
SMARTSCIPT	**Smartscript** – This allows the user access to the Smartscript Main Menu after prompting for a password. Smartscript is a scripting language used to run TPS3 & 4 controlled machines. (Access is limited to a DeMichele engineer in most instances.)
MAIN MENU	**Main Menu** – Returns the user to the main menu
I/O TESTING	**I/O Testing** – This allows the user to perform diagnostic operations on the system's inputs and outputs. The current state of the inputs is displayed on the right side of the screen and the status of the outputs is shown on the left side of the screen. The state of the outputs can be changed by clicking on each output button.
AXIS TESTING	**Axis Testing** – This allows the user access to Axis Diagnostic tools, which are used to test axis movement and encoder function.
SET TIMERS	**Set Timers** – This allows the user access to the system timers. These timers are used to control automation of various system components.
REPORTS	**Reports** – Provides the user with current & cumulative totals for pieces of material cut, physical cuts, stock lengths used, and yields.

Materials Selection

Material Selection Display Window

	PART NAME	STOCK SIZE	KERF	OFFSET	TRIM	MULTIPLES	MULTIPLIER	MATCH PART
	52-2801-BEI	192	4.3625	0	2	1	1	
	52-2801-WHT	192	4.25	0	2	1	1	
	52-2901-BEI	206	0.25	0.032	0.5	1	1	
	52-2901-WHT	206	4.3625	0.032	2	1	1	
	52-2902-BEI	206	4.3625	0	2	1	1	
	52-2902-WHT	206	4.3625	0	2	1	1	
▶	52-4012-WHT	206	4.3625	0	0.5	1	1	
	52-8503-WHT	192	0.125	0	1	1	1	

52-4012-WHT

SEARCH   ADD   COPY   DELETE

SELECT PART

Figure 14.1 Materials Selection Screen

Part Name − This displays the current part name, which can be edited directly. In order to enter a new part, the user must scroll or jump to the last material on the list, which will be named **PART**. Entering a new name will create and save the new material. The remaining fields are set up with default values that may be edited by the user directly within the fields.

Stock Size − This displays the stock size for the current material. This defaults to 144 in.

Saw Kerf − This displays the width of material removed by the saw blade itself for the current material. This value defaults to 0.125 or 1/8 in.
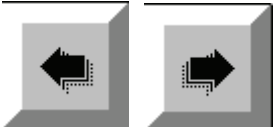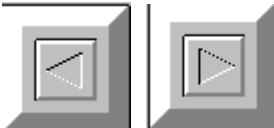
Material Selection controls

Offset – The offset value is added to or subtracted from the part length to get the actual position the stop moves to.   The offset is typically used when cutting mitered parts to account for the increased tip-to-tip length of the part due to the angle of the miter.   A positive offset adds to the part length to get the actual position and a negative offset subtracts from part length to get the actual position.

Trim – This displays the amount of unusable material that must be trimmed from the stock. This value defaults to 1 in.

Multiples – The maximum number of pieces that can be grouped together and cut at one time.   In some cases, the material can be stacked to permit cutting more than one piece at a time.   This is normally limited by the physical size of the part and the depth of cut of the saw. The default value is 1 unless otherwise specified.

Multiplier — This is used to multiply the quantities merged in from a cutlist. In some cases, only half the quantities are contained in the cutlist, since the head/sill parts are often identical and the side jambs are identical. In this case, the cutlist may contain only one head part and one side jamb. The multiplier would be set to 2 to expand the list to the correct number of parts.

Pushbutton	Function
	Black Left & Right Arrows – These arrows allow the user to jump directly to the first and last material in the list.
	Gray Left & Right Arrows – These arrows allow the user to scroll through the materials list selecting one entry at a time.
DELETE	**Delete** – The delete button allows the user to remove a selected material from the list.
SELECT	**Select** – The select button will save the displayed part as the working material and return the user to the previous screen.

System Settings

Figure 14.2 System Settings

Jig Insert Tool - Used when cutting a part smaller than the minimum position. For example, the minimum position is 10" and the jig tool is set to 10", then to cut a 5" part, the positioner will stop at 15" and call for the 10" jig tool.

Back Up Distance - An additional back-up distance the stop will move after each cut. This is used when a saw does not allow the part to be removed without the stop or pusher positioner backing up.

Safe Zone - Distance from each end that the system will warn operator to beware of pinch points.

Minimum Position: The distance between the "home position" and the saw blade, or the minimum length that can be cut on the machine without the use of a jig tool.   This value can be entered through the keypad by pressing the Minimum Position button or can be set using the Set Home Position in the Calibration menu.
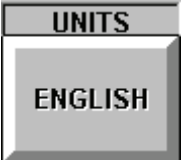
Maximum Position: The maximum part length that can be cut. This value corresponds to the travel length of the rail plus the minimum position.

Calibration Value: The calibration constant used for the positioner's measurement calculations. This value is set by running the Calibration function.   The calibration value can be entered through the keypad by pressing the Calibration Value button.

Once the machine has been calibrated properly, this value should be recorded for future reference.

Any changes made to the parameters on the System Settings screen will not be accepted until the UPDATE button is pressed.

System Settings Button Controls

Pushbutton	Function
UNITS ENGLISH	**Units** – This button displays the unit type, English (in.) or Metric (mm.) currently being displayed and accepted by the computer. Selecting this button will toggle the displays to the current units.
Cancel	**Cancel** – This button disregards any changes made and returns the user to the Machine Setup Menu.
UPDATE	**Update** – This button saves any changes made and returns the user to the Machine Setup Menu.
CHANGE AXIS	**Change Axis** – For multiple axis systems, this button allows the user to access the settings for multiple controller axes.

Move Settings

Figure 14.3 Move Parameters Screen

WARNING: Adjust these settings CAREFULLY. If care is not used, the system could become unstable and damage the machine. Call ATI at (480) 985-4926 if you have any questions about adjusting these parameters.

Move controls

Pushbutton	Function
HOME VELOCITY	**Home Velocity** – This allows the user to adjust the velocity at which the fence seeks the home position. It is important that this value not be too great so that the impact with the home stop will not damage the axis.
HOME STRENGTH	**Home Strength** – This allows the user to adjust the strength with which the fence finds and holds the home position. If this value is to low, friction or other forces affecting the fence might prevent it from reaching the home position or staying there.
MOVE VELOCITY	**Move Velocity** – This allows the user to adjust the velocity at which the fence moves to the desired position. Again, excessive velocities can damage the axis as the system approaches the minimum and maximum positions.
MOVE STRENGTH	**Move Strength** – This allows the user to adjust the strength with which the fence pushes and holds the materials. This value needs to be large enough to overcome jams and resist movement when the material is placed up against the fence.
ACCELERATION	**Acceleration** – This allows the user to adjust the rate at which the fence attains its home and move velocities.

Pushbutton	Function
Cancel	**Cancel** – This disregards any changes made and returns the user to the previous screen.
UPDATE	**Update** – This saves any changes made and returns the user to the Machine Setup Menu (Figure 14.3).
Change Axis	**Change Axis** – For selected applications, this button allows the user to access the settings for multiple controller axes.

PID Parameters

Pushbutton	Function
PROPORTIONAL	**Proportional** – This allows the user to adjust the proportional term. This term is related to the power applied, compared with the distance away from the desired location. If the distance is 1 inch, the power is x, if the distance away is 2 inches, the power is 2x. Increasing the proportional term increases the power. WARNING: Too large a setting will cause the system to move erratically.
INTEGRAL	**Integral** — This allows the user to adjust the integral term. The integral adds a value to the proportional based upon the time required to reach a position.
DERIVATIVE	**Derivative** – This allows the user to adjust the derivative term. This term is related to the power applied to dampen the system as it approaches the desired position.
I-LIMIT	**I-Limit** – This allows the user to adjust the integration limit. The Integration Limit sets the "wind up" for the system. The higher the value, the larger the "BUMP". If the system is close to the correct position, this term allows enough BUMP to nudge it to the position. If the bump is too big, the system will oscillate.
SPEED FACTOR	**Speed Factor** – This allows the user to adjust the speed factor. The user can adjust this value to compensate for differences in gear ratios.

Passkey

Figure 14.4 Security Screen

Security Button Controls

Pushbutton	Function
	Change Passkey – This button allows the user to change the passkey. Once selected the user is prompted to enter the current passkey followed by the new passkey.
	Accept – This button is pressed after all of the procedures from the Change Passkey button have been carried out successfully. It changes the passkey to the contents of the **NEW PASSKEY** window and returns the user to the Machine Setup menu.
	Cancel – The cancel button causes the system to disregard any changes made and returns the user to the Machine Setup menu.

Initialize Axis

Figure 14.5 Initialize Axis Screen

Initialize Drive Controls

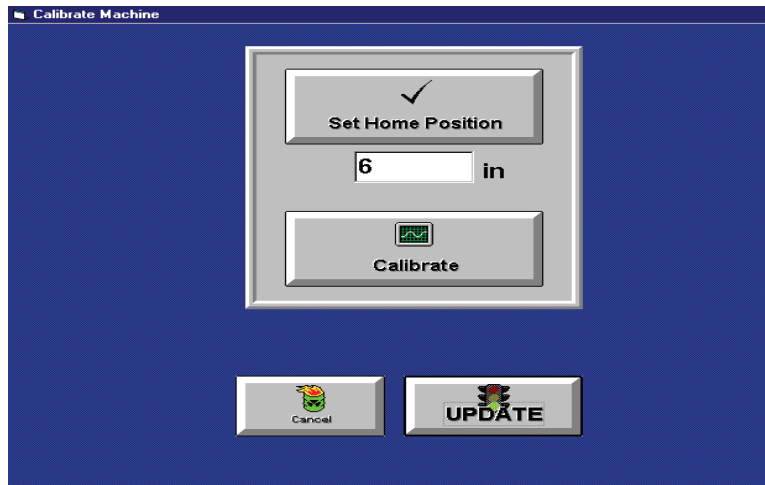| Pushbutton	Function
	Cancel – The cancel button causes the system to disregard any changes made and returns the user to the Machine Setup Menu.
	Initialize – This button allows the user to initialize the axis. Once pressed the fence moves toward the home position. The user will then be asked to verify the direction of the move (normally the home direction is towards the Saw Blade). The fence then moves to the far end of the rail and sets the new max distance. Once the routine has been performed successfully, the user is returned to the Machine Setup menu
	Change Axis – For selected applications, this button allows the user to access the settings for multiple controller axes.

Calibrate Machine

Figure 14.6 Calibrate Machine Screen

Calibrate Machine Button Controls

Pushbutton	Function
	Set Home Position – This button allows the user to set the home position. The machine will home and the user will be prompted for the offset. Once the home position is set, the user can either calibrate the machine or update the home position data.
	Calibrate – This button allows the user to calibrate the axis, however, the user must first set a base position for the calibration measurements with the Set Home Position button. Once the Calibrate button is selected the system will move to a position on the rail and prompt the user for the correct length. The computer will then adjust the calibration based upon the difference between its measured value and the user input. Test the system and run the calibration sequence again if the positions are still not within tolerances.

Calibrate Machine Button Controls

Pushbutton	Function
	Update – The update button allows the user to accept their home position and calibration settings and return to the Main Menu.
	Cancel – The cancel button causes the system to disregard any changes made and returns the user to the Main Menu.

*   If the system is still not calibrated after two attempts then proceed to AXIS DIAGNOSTICS and run the ENCODER CHECK to test the system.

Smartscript

SMARTSCRIPT

SmartScript is a scripting language used to run TPS controlled machines. Scripts are to be modified by trained Machine Manufacturers and DeMichele engineers only.

Diagnostics

I/O Testing Menu
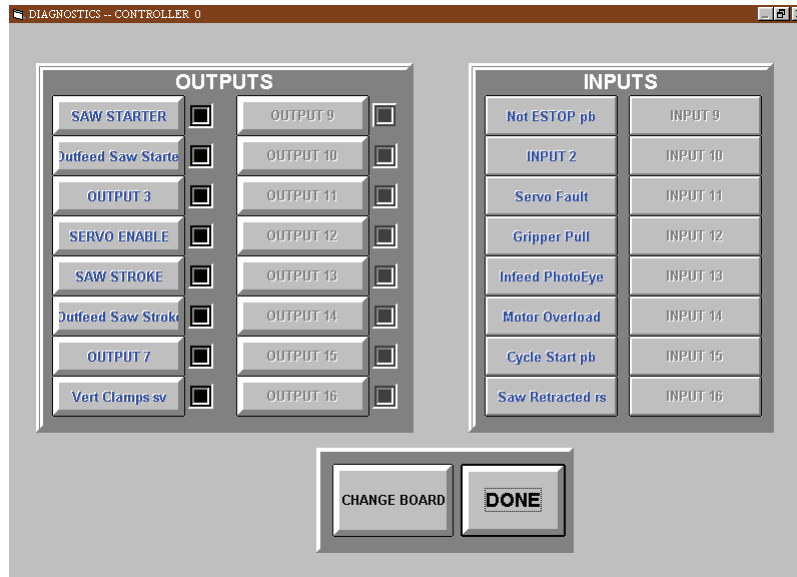
Figure 14.7 Diagnostic Screen

Outputs – Pressing the button with the appropriate name can test each of the controller outputs. If the controller is functioning properly, the checked box will toggle to the adjacent box to represent the change of state.

Inputs – Switching the input signal and watching the color of the Input buttons can help test the inputs to the controller. For example, if the user presses the red Emergency Stop button located on the button box the ESTOP input button on the screen will change color from green to grey. When the ESTOP button is released, the color will change back to green again. For example, if the user presses the red Emergency Stop button located on the button box the E-STOP checkbox on the screen will toggle to the right box while the button is pressed and will toggle back to the left when the button is released.

Change Board – For applications with multiple controllers, this button can be pressed to perform the diagnostic procedures on another board.

Done – This button returns the user to the Machine Setup Menu.

Axis Diagnostics Controls

Jog Axis Menu

Figure 14.8 Jog Axis Screen

Axis Diagnostics Controls
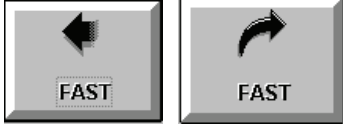
Pushbutton	Function
	Fast Arrows – These buttons move the shuttle in the direction of the home position. The fast arrow moves the shuttle at the speed listed next to the speed button towards or away from the home position.
	Slow Arrows – The Slow arrows move the shuttle towards or away from the home position at approximately half the speed of the Fast buttons.
	Speed – This button calls up the number pad and allows the user to enter the speed used for the Fast Arrow test procedures. The Slow Arrows move at approximately half of this speed. The speed can also be edited directly within the window.

Pushbutton	Function
	Position Axis— This Button is used to move the carriage to a specific position for testing, similar to a manual move.
	Stop/Exit – This button returns the user to the Machine Setup Menu. If the encoder test program is running, this button stops it and returns the user to the Machine Setup Menu.

Timer Menu

Figure 14.9 Timer Screen

Timer Buttons 1-10 – Use these buttons to set the delay timers for any optional Smartscript machine operations. To set a timer, press the appropriate button and enter the new timer value via the number pad.

Cancel — The cancel button causes the system to disregard any changes made and returns the user to the Machine Setup Menu.

Update – The update button allows the user to save any changes made and returns the user to the Machine Setup Menu.

Production Report

Figure 15.0 Report Screen

Reset – Use the Reset buttons to set the material data to zeros and set the "**As Of**" date to the current date. This allows the user to track machine statistics on two separate counters. It can be used to track daily, weekly, monthly, or annual production.

Cut Reminder - Use the Cut Reminder button to set the number of cuts to be performed before the calibration or maintenance warning appears.

Done – Use the done button to return to the Main Menu.

Production Report Display Windows

1) **Current & Cumulative Totals**

 > **As of –** Shows the date when the window counter was last reset.

 > **Pieces –** Shows the number of pieces cut since the "As of" date.

 > **Cuts –** Shows the number of cuts made since the "As of" date.

 > **Stock Lengths –** Shows the number of stock lengths used since the "As of" date.

 > **Yield –** Shows the percentage yields obtained from the total cuts since the "As of" date.
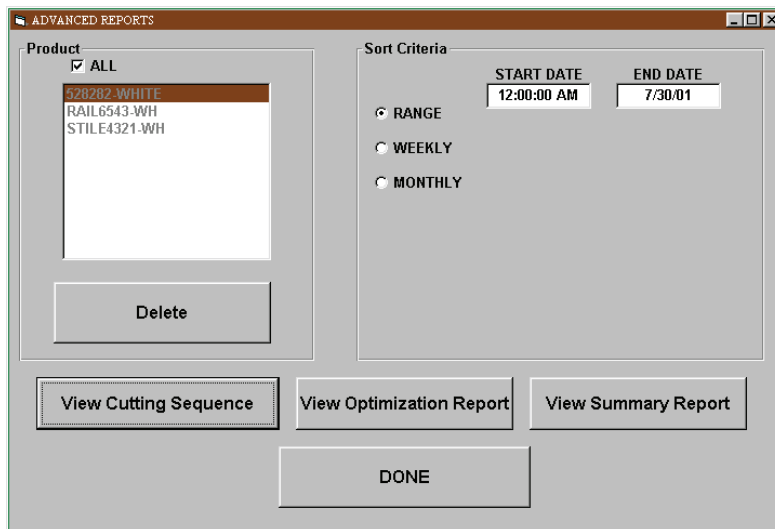
Figure 15.1 Advanced Reports

Level II: Drop Bins

Drop Bins

This feature enables the automated drop-tracking feature of your TPS positioner. Once enabled the system will automatically keep track parts left over from each optimization run. The system will then call for these drops in subsequent optimizations to maintain the highest possible yields for your materials.

ACCESSING DROP BINS
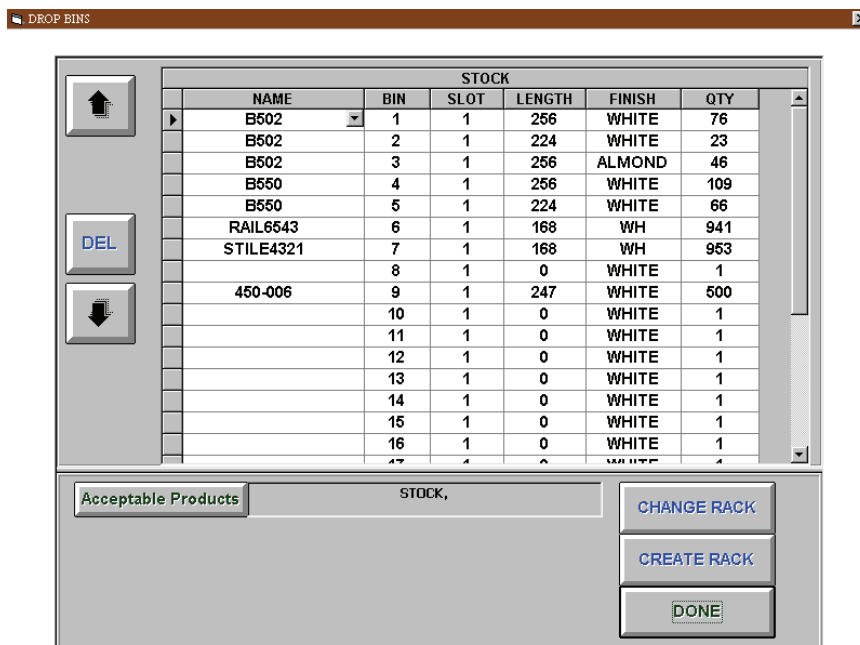
Figure 15.2 Drop Bin Screen

1   Enter the Drop Bin inventory list by calling your cutlist and selecting the EDIT Drops pushbutton. (Figure 15.2)
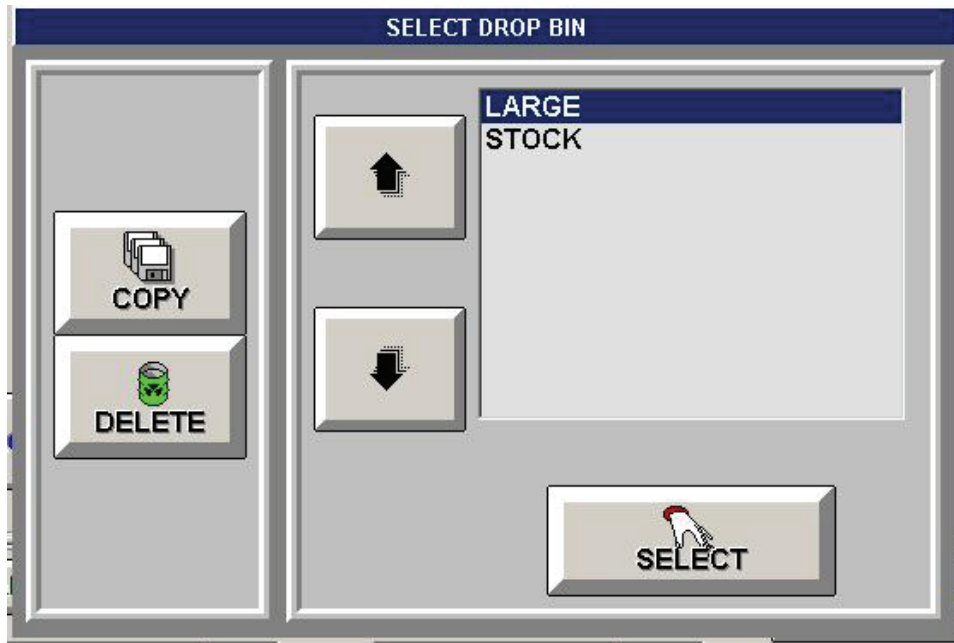
Figure 15.3 Select Drop Bin Screen

2   Select the appropriate list for drops. (Figure 15.2)
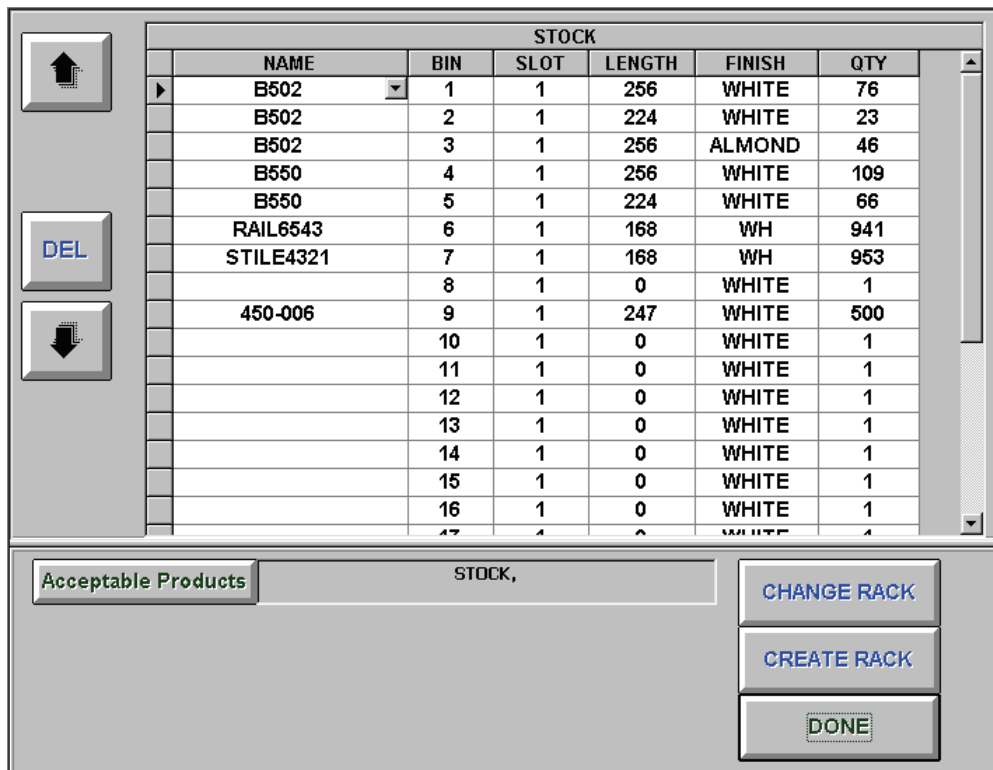
Figure 15.4 Stock Bin Main Screen

3   Verify Inventory list and quantities and press done to continue.

User Defined Drop Bins

Figure 15.5 User Drop Bin Screen

When a new drop bin is created, the default is to allow all products in the material database to be stored in the drop bin.   This can be changed by modifying the Acceptable Products. This allows different drop bins to be created for different material types, uses, or finishes.

Minimum Drop: The minimum part length to be considered a drop. Parts shorter than this length are considered scrap and discarded.

Maximum Drop: The maximum length of a part to be considered for this drop bin. Used to create drop bins for short or long parts.

Preference: The preference weighting to be given to this drop bin for optimization purposes.

Length offset: Used to specify a desired minimum length difference between parts stored in adjacent bins, to allow for easier drop identification based on length.

Print Tag: Used to print a drop tag for a part (requires label printer option be installed and enabled).
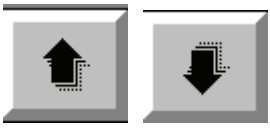
Drop Bins:

In Level 2, the STOCK drop bin contains the stock inventory quantities.

Warning: The STOCK drop bin must not be deleted or the program will not function properly.

Additional drop bins can be created corresponding to the carts or racks used to store the drops. Use the CREATE RACK button to create a new drop bin.   The drop bin name can only be a combination of letters or numbers, no characters!   Dashes, spaces, apostrophes, underscores, etc are not allowed in the bin name!

Drop Bin Controls

Pushbutton	Function
	Up & Down Arrows – These arrows allow the user to scroll through the Cutlist list.
DEL	**Delete** – This button removes the selected item from the drop bin list.
Acceptable Products	**Acceptable Products** – This button selects the acceptable products for the current drop bin list..
CHANGE RACK	**Change Rack** – This button changes the current drop list to another stored drop list.
CREATE RACK	**Create Rack** - Creates a new drop bin list.
DONE	**Done** - Takes you back to the cutlist main menu.

How Do I?

EDIT/LOAD CUTLIST
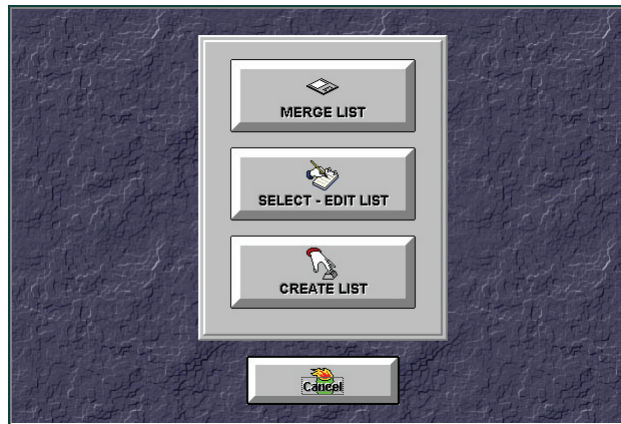
Figure 16.1 Edit /Load Cutlist

Edit/Load Cutlist Window Displays

List – The field at the top of the screen displays the name of the list. This can be set when the list is created. All of the following cells can be edited directly by selecting the cell and typing in the information.

Name – This column of cells stores the list of part names.

Finish – This column stores the finish color for each part.

Qty – This column stores the number of each part that will be cut.

Cut – This column stores the number of each part that has already been cut. This column will be updated automatically by the system as the list is cut. This serves as a reminder to the user editing a list after completing a portion of it.

Length – This column stores the length of each part.

Bin – This column stores the number of the bin where each part is stored.

Order – This column stores the Order Number for each part.

Remarks – This column stores any special comments for the system operator.

Make a Manual Cut

To make a manual cut, all you need is the distance, part name and how many you want to cut.

1   Press the Manual Positioning pushbutton to enter the manual mode main screen.

2   Set the appropriate part to be cut.

3   Set the repeat for how many you wish to cut.

4   Enter the cut distance you want the positioner to move to from the current home position.

5   Press the start button to move.

6   Press the continue button to move each additional piece in place.

Make a Pattern

Patterns are similar cuts that are made such as dado cuts on a board, weep holes for drilling \ router stations, or stock cuts.

Patterns can be merged in from a comma-delimited file, or can be entered through the pattern mode main menu.

1   Select Pattern Mode.

2   Select Edit Pattern from the Pattern Mode Main screen.

3   Enter Passkey to continue.

4   Select a current pattern to change or select the add pattern button.

5   Key in pattern name, description and up to 25 distances for the pattern to move to.

6   Select done when finished.

Merge Cut List

When you want to merge a cut list, you have to make sure that the cut list has some definable breaks between fields. This is referred to as delimited. You can create this field by opening notepad and placing a comma between each field.

```
I.e.    p502a,white,2,3,1234,Bin1,none

        P502b,white,3,4,1234,Bin2,none
```

You can also create this file in excel or any other spreadsheet and save it as a .CSV.

The primary information used is:

    ⊠ Part Number

    ⊠ Finish

    ⊠ Length

    ⊠ Quantity

    ⊠ Order #

Secondary information includes:

    ⊠ Machine #

    ⊠ Bin #

    ⊠ Remarks

    ⊠ Batch #

Once you have created the file, you have to tell the TPS software how to import it.

1   Go to SETTINGS dropdown menu.

2   Select Merge field.

3   Key in Passkey.

4   Set the type of file and how it is separated or delimited.

5   Set the fields for the appropriate settings and press the test merge button.

6   Select the OK pushbutton to accept merge instructions.

NOTE: Make sure the fields populated properly prior to finishing the merge settings.

1 Select Optimizer.

2 Select Edit List.

3 Select merge

4 Select the file you wish to merge.

5 Select done when finished.

Reverse Home Direction

If the pusher or stop is setting the home position to the wrong side, then you have to reinitialize the axis to fix the problem.

1. Select Machine Setup.

2. Select Initialize Axis.

3. Clear home path and select OK.

4. If machine homed to wrong side, then select no at the prompt.

5. Once machine homes to the correct side, select Yes.

6. Select Done when complete.

Insert a Back Off after each cut

Some saws have no space to remove the cut part, unless the positioner moves out of the way temporarily. You can set a back off that will move the positioner out of the way after a cut has been performed.

1 Go to Machine Setup.

2 Enter Passkey.

3 Go to System Settings.

4 Set back off position. 1 = 1 inch backup.

5 Exit Setup.

Every cut will have an additional step that backs the positioner off to remove the cut part.

Troubleshooting

Troubleshooting: Questions & Answers

Q1. The machine accuracy seems to vary from part to part, what are some of the causes.

A1. Typically, CALIBRATION is the biggest contributor. Try re-calibrating the machine, if that does not help then there may be a problem with the ENCODER/MEASUREMENT system. Use AXIS Diagnostics from the Machine Setup menu to test the encoder.

Q2. The machine is accurate within one area or length and then is out of tolerance on all other points.

A2. This is a combination of parameter errors. The home position is likely off by a small amount and the calibration value is off, forcing the system to be accurate at only one point. Try re-calibrating the machine, if that does not help then there may be a problem with the ENCODER/MEASUREMENT system. Use AXIS Diagnostics from the Machine Setup menu to test the encoder.

Q3. The system vibrates, oscillates or moves erratically.

A3. The most likely cause is the PID Parameters in the MOVE SETTINGS screen. These parameters need to be adjusted to stop the vibration. Lower the Proportional term and retest until the vibration stops.

Q4. The system displays a "Machine Jammed" message during moves.

A4. The most likely cause is the PID Parameters in the MOVE SETTINGS screen. Slowly raise the I-LIMIT term until the system no longer jams.

WARNING: Adjust these settings CAREFULLY. If care is not used the system could become unstable and damage the machine. Call ATI at (480) 985-4926 if you have any questions about adjusting these parameters.

Q5. The touch screen still displays the menus but no longer responds to touch.

A5. This problem is most likely due to the mouse cable being loose at either the computer or the monitor. If there was a "Touch Screen is not Responding" message when the machine was first turned on then the cable was probably not connected. Check to see that the cable is secure. If you cannot remedy the touch screen problem, you can still operate the system as long as your computer also has a mouse or a keyboard. If you have a mouse, the system buttons will respond to the **primary mouse button** in the same way that it would respond to touch, just point and click. If you only have a keyboard then the v (tab) key will highlight on a different button each time it is pressed. Simply tab to the appropriate selection and hit enter to select it. The drop down menus can be accessed by pressing **Alt-F**, **Alt-S**, and **Alt-H** respectively. Once the menus are selected, the arrows and the Enter key on the keyboard can be used to highlight and select the correct option.

Q6. The system displays a "Power is Not On" message from any screen.

A6. This system message is designed to notify the operator that the controller box is either not turned on or not plugged in.

Error message: "TPS Data Error"

Solution: This is usually due to a comma in the Customer Name field in the setup.

The TPS.INI is a csv file, so the comma throws off the data fields in the INI file.

Error message: "Total cut length exceeds available material. Add more stock and retry"

This error happens when the cutlist contains a piece that is longer than the stock length minus the trim cut. For example, if the stock length is 289" with a 1" trim, if the cutlist calls for a 288.001" part this error message will be displayed.

Solution: This can be fixed by increasing the stock length or reducing the trim cut in material parameters.

Problem: Parts not being acknowledged as cut in the list. Ie – the merged cutlist "drops" parts that are shown in the printed cutting instructions.

Solution: The problem is a result of an apostrophe in the BIN field. For example, the text in the BIN field might contain the phrase "Children's Hospital". If the text is changed to "Childrens Hospital", the cutlist will work fine.

Glossary

CUTLIST

A list of cutting instructions for the machine to use. It contains LENGTHS, MATERIALS and QUANTITIES. It may also contain Bin Information, Colors, or Remarks.

DERIVATIVE

The derivative represents a force applied, in an opposite direction to the system's movement, to slow down the machine as it approaches the desired position. **Do not adjust this value unless you have contacted ATI.**

HOME

Position that represents absolute zero for the Controller. This position is usually where the saw blade is located. The Offset is then added to get the true HOME position.

I-LIMIT

The Integration Limit sets the "wind up" for the system. The higher the value, the larger the "BUMP". If the system is close to the correct position, this term allows a BUMP to nudge it to the position. If the bump is too big, the system will oscillate. **Do not adjust this value unless you have contacted ATI.**

INTEGRAL

The system calculates a set time limit for the material to reach each position. The integral term increases the value of the proportional term to ensure that the system reaches the desired position within the time limit.

NUMBER PAD

A screen that allows the user to input numerical data using a calculator like touch screen display.

MAXIMUM SPACING

The maximum distance that the machine can travel, this can be set by initializing the machine.

OFFSET/MINIMUM SPACING

The offset refers to an additional position that will be added to any positions entered for that material. The fence cannot actually reach the motor end of the rail because of space taken up by the motor and its assembly. The offset is the minimum spacing between the fence position closest to the home end of the rail and the saw blade.

PASSKEY

Security Key Code that restricts access to certain control areas of the program. It can be set and changed from the Machine Setup menu.

PROPORTIONAL

The proportional term is related to the power applied compared with the distance away from the desired location. If the distance away is 1 inch the power is x, if the distance away is 2 inches the power is 2x. Increasing the proportional term increases the power.

WARNING: Too large a setting will cause the system to move erratically. Do not adjust this value unless you have contacted ATI.

SAW KERF

The amount of material removed by the saw blade in ONE cut.

STOCK LENGTH

Total length of material in a STOCK part.

TOLERANCE

The required accuracy that the material is to be cut to. The default TPS tolerance is 1/64 in.

TRIM

The amount of unusable material that is trimmed from the stock length to create a usable length.

ECL-Enclosure Systems

ECL-Enclosure Systems

Model: ECL-3400-2

System includes:
1 - ECS-1000 Enclosure Stand
1 - ECL-3000-2 Enclosure with Fan Filter Kit
1 - ECS-1200 Keyboard Tray
1 - PM-400 Printer Base

Model: ECL-3500-2

System includes:
1 - ECS-1000 Enclosure Stand
1 - ECL-3000-2 Enclosure with Fan Filter Kit
1 - ECS-1200 Keyboard Tray
1 - PM-500 Printer Base

ECS-1000 Enclosure Stand
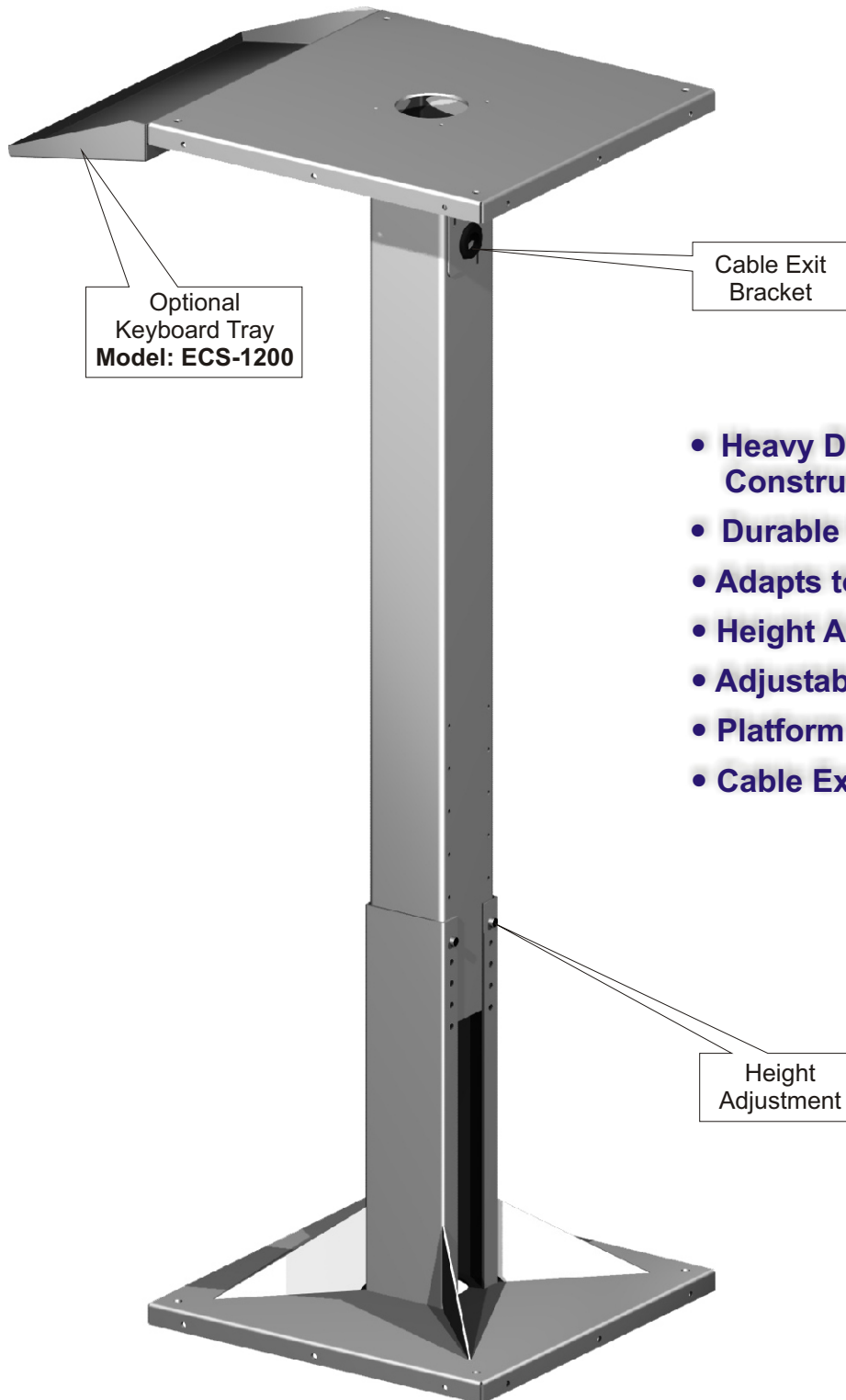# Height Adjustable

Model: ECS-1000

ECS-1000 Enclosure Stand

Optional
Keyboard Tray
Model: ECS-1200

Cable Exit
Bracket

Height
Adjustment

- **Heavy Duty 10 Gauge Steel Construction**
- **Durable Powder Coating Finish**
- **Adapts to All ATI-Enclosures**
- **Height Adjustment: 46.0" - 56.0"**
- **Adjustable in 1" Increments**
- **Platform Size: 18.0" x 18.0"**
- **Cable Exit on Top and Bottom**

ECL-3000 Enclosure

Model: ECL-3000-1

ECL-3000 Enclosure

- **Heavy Duty 14 Gauge Steel Enclosure**
- **Durable Powder Coating**
- **Front & Rear Door for easy access**
- **External PC-On/Off Switch & 2 x USB Ports**
- **Designed to enclose: TPS-250/200 controller, LCD-Monitor with Touch Screen, Computer, Keyboard and Mouse**
- **Adapts to ATI-Enclosure Stand Model: ECS-1000**
- **Rubber Gaskets around Doors**
- **Size: H=16", W=18", D=20"**
- **Optional Fan Filter Cooler & Vortex Cooler available**

Optional 15 Inch LCD-Monitor
Model: LCD-TS15

PC-Start Button
2 x USB Ports

**Vortex Cooler
Model: TCCK-4225**

Includes water/oil filter and thermostat.
The vortex cooler creates positive air pressure in the enclosure keeping dust and debris from entering air holes. The vortex cooler also emits cool air to protect your PC, controller and monitor from overheating. An electric thermostat allows the cooler to run only when the temperature exceeds a preset value to avoid wasting compressed air.
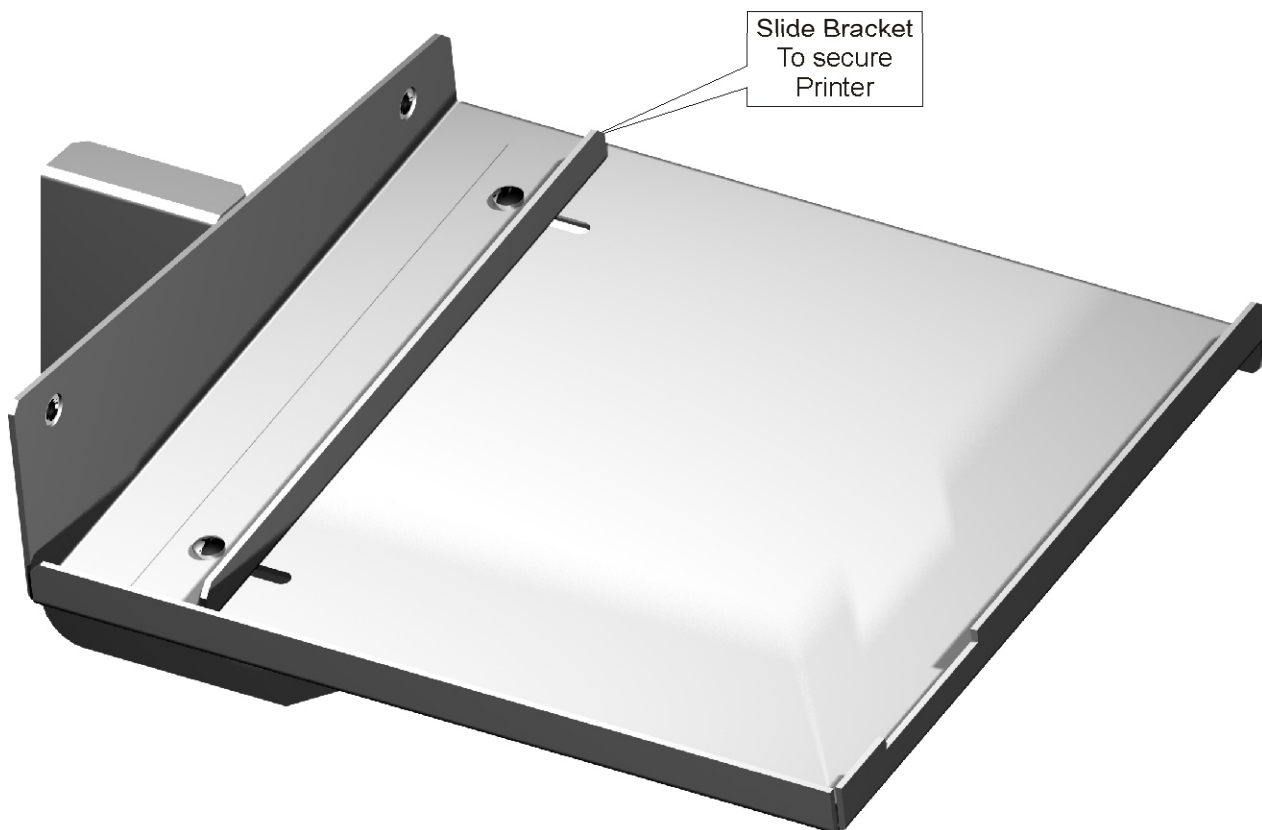
**Filter Fan Cooler
Model: FF-018**

- Provides optimum climate in enclosure
- Very low noise
- Airflow: 24 CFM
- Power Consumption: 15Watt
- User replaceable filter media

PM-400 Printer Stand

Model: PM-400

PM-400 Printer Stand

Slide Bracket
To secure
Printer

- **Heavy Duty 16 Gauge Steel**
- **Durable Powder Coating Finish**
- **Adapts to All ATI-Enclosure Stands**
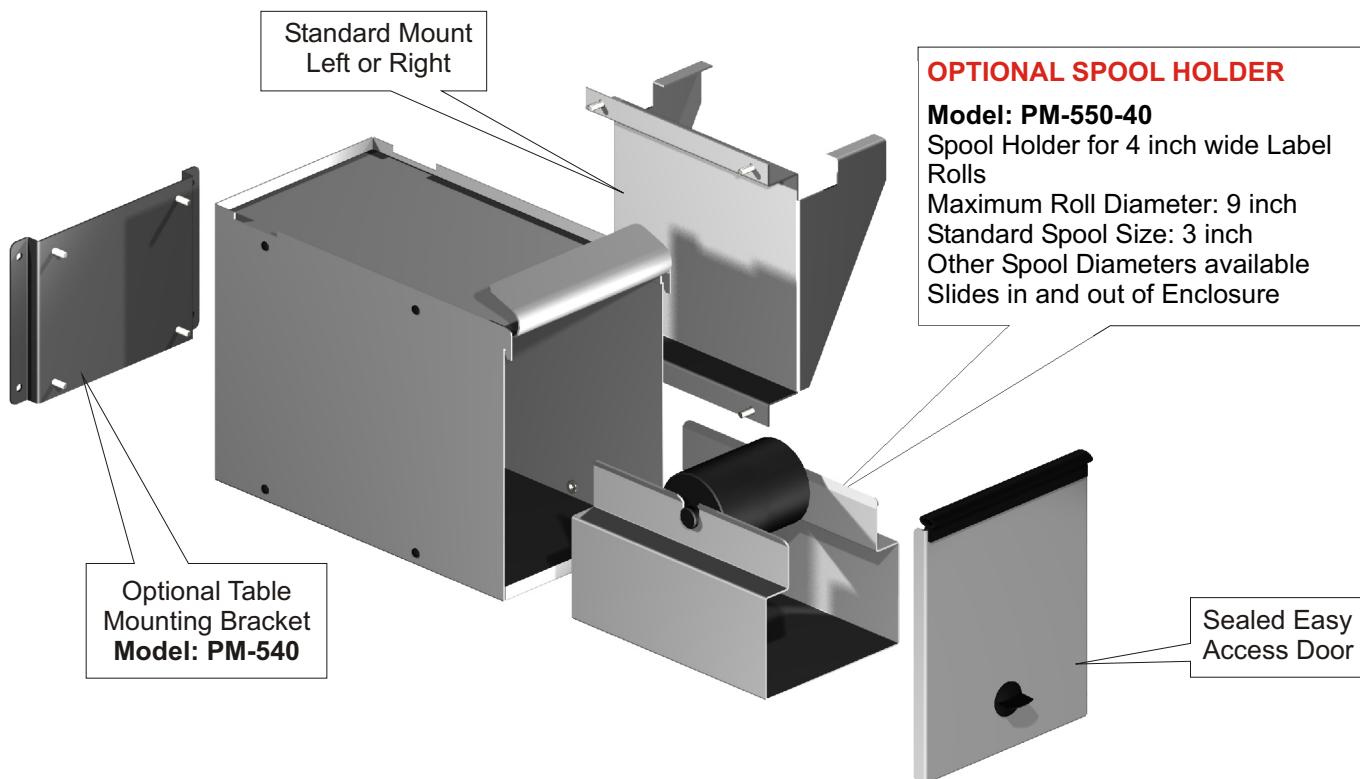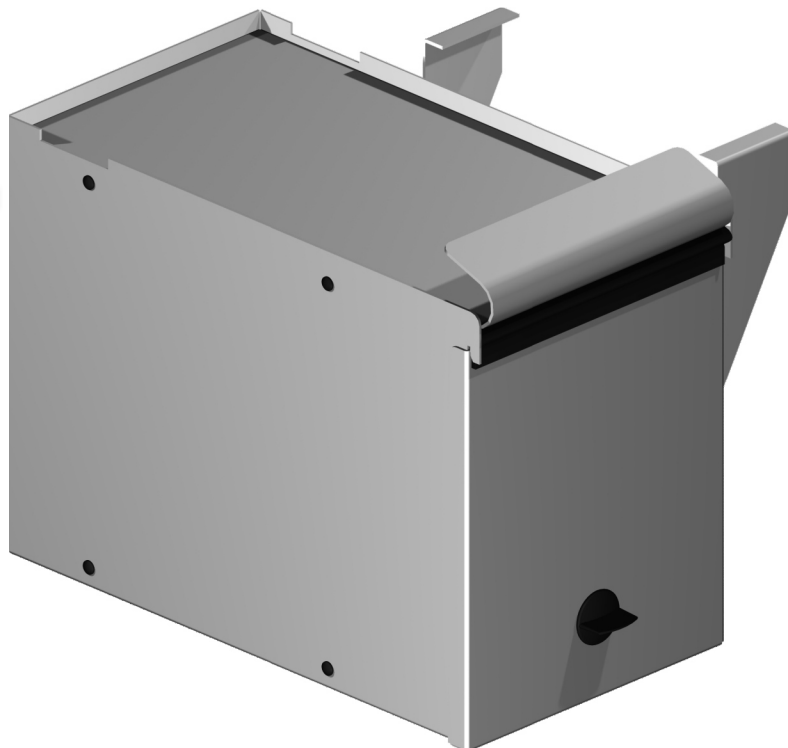- **Attaches to Right Side of Enclosure**
- **Printer Platform Size: 7.3" x 8.5"**

PM-500 Printer Stand

Model: PM-500

PM-500 Printer Stand

- **Heavy Duty 16 Gauge Steel Enclosure**
- **For use with Fan-Fold or Optional Roll Labels**
- **Fan-Fold Label Size: W=4.0", D=12.0", H=10.0"**
- **Adapts to All ATI-Enclosure Stands**
- **Optional Table Mount Available**
- **Can be mounted on Left or Right Side**
- **Sealed, Easy Access Door for Loading**
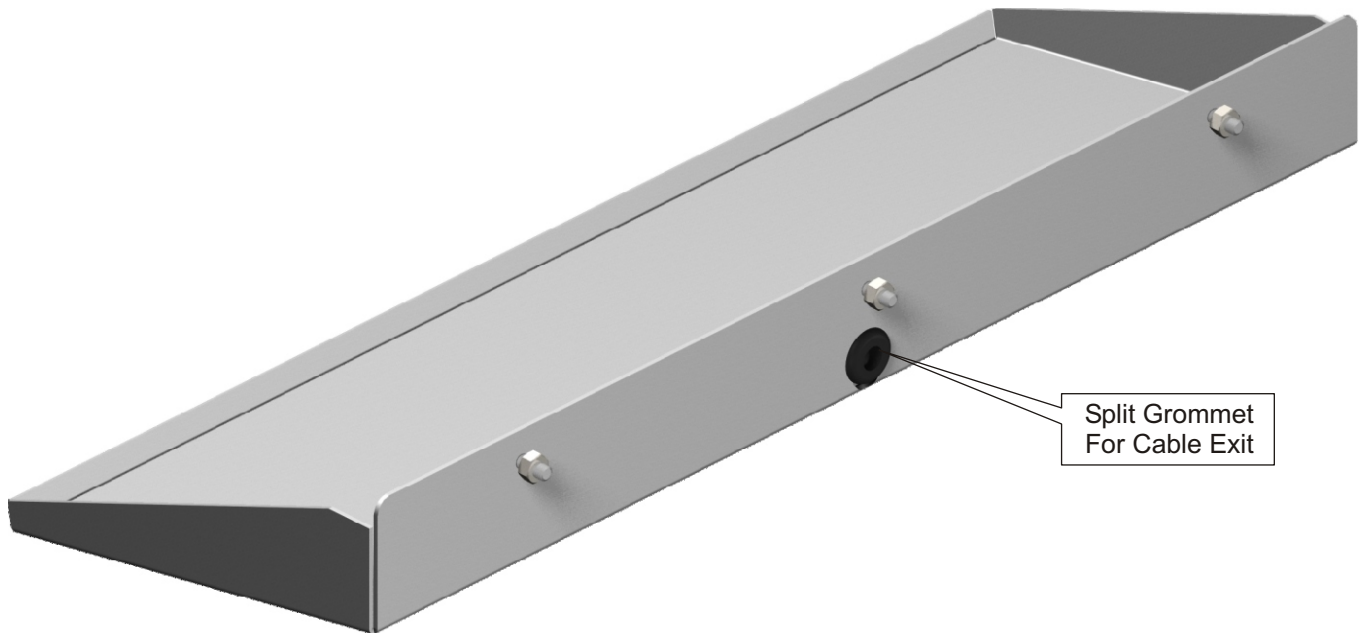- **Printer Platform Size: 7.3" x 12.0"**

Standard Mount Left or Right

OPTIONAL SPOOL HOLDER

Model: PM-550-40
Spool Holder for 4 inch wide Label Rolls
Maximum Roll Diameter: 9 inch
Standard Spool Size: 3 inch
Other Spool Diameters available
Slides in and out of Enclosure

Optional Table Mounting Bracket
Model: PM-540

Sealed Easy Access Door

ECS-1220 Keyboard Tray

Model: ECS-1220-1

ECS-1220 Keyboard Tray

Split Grommet For Cable Exit

- **External Keyboard Tray to eliminate the opening of front door**
- **Heavy Duty 14 Gauge Steel Construction**
- **Durable Powder Coating Finish**
- **Adapts to All ATI-Enclosure Stands**
- **Attaches to existing mounting holes**
- **Accommodates small Keyboard and Track Ball or Full Size Keyboard with integrated Track Ball**
- **Keyboard Tray Size: W = 19.8", D = 7.3"**

Digital Length Measuring Device

SuperCaliper

- **Sturdy aluminum guide profile with machined aluminum parts**
- **Display resolution to 3 decimal places for inch readout, 2 decimal place for metric readout**
- **Measuring length from 1 to 4 meters (3 to 13 ft)**
- **Internal & External Measuring with Lock**
- **6 month battery life with 1 "AA" cell**
- **Decimal and fractional display mode**
- **Large, easy to read LCD display**
- **Custom lengths available**

MA504 DISPLAY

Decimal and fractional display mode
1/64" display resolution in fractional
0.001" display resolution in decimal inch
0.01mm display resolution in metric
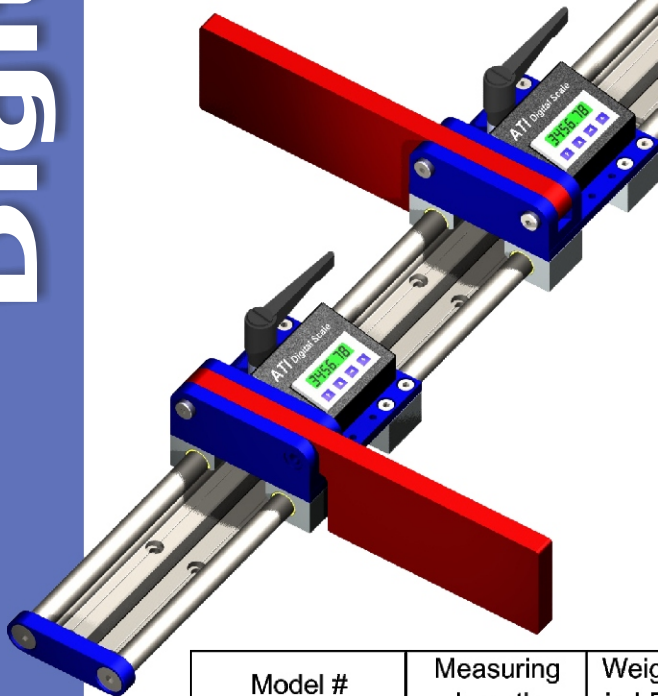**User replaceable battery**
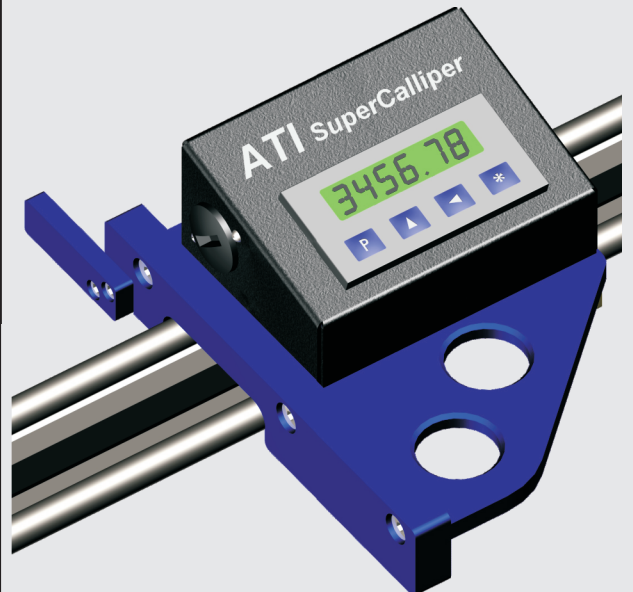
| Model #	Measuring Length	Weight in LBS	Price
SC-1.0-MA504	1m (40")	4.5	$1,600.00
SC-1.5-MA504	1.5m (60")	5.6	$1,700.00
SC-2.0-MA504	2m (79")	6.7	$1,800.00
SC-2.5-MA504	2.5m (98")	7.8	$1,900.00
SC-3.0-MA504	3m (118")	8.9	$2,100.00
SC-3.5-MA504	3.5m (138")	9.9	$2,300.00
SC-4.0-MA504	4m (157")	11.0	$2,500.00

MPS1-Digital Length Stop

Digital Stop

- Sturdy aluminum guide profile with machined aluminum parts
- Display resolution to 3 decimal places for inch and 2 decimal places for metric readout
- Measuring length from 1 to 4 meters (3 to 13 ft)
- Single or Multiple Stop Heads with Lock
- 6 month battery life with 1 "AA" cell
- Decimal and fractional display mode
- Large, easy to read LCD display
- Left or Right Infeed availabe
- Inch or Metric readout
- Flip or Fixed Stop

MA504 DISPLAY & Flip Stop

**Decimal and fractional display mode
1/64" display resolution in fractional
0.001" display resolution in decimal inch
0.01mm display resolution in metric
User replaceable battery**

| Model #	Measuring Length	Weight in LBS
MPS1-1.0-MA504	1m (40")	10.0
MPS1-1.5-MA504	1.5m (60")	13.9
MPS1-2.0-MA504	2m (79")	17.7
MPS1-2.5-MA504	2.5m (98")	21.6
MPS1-3.0-MA504	3m (118")	25.4
MPS1-3.5-MA504	3.5m (138")	29.3
MPS1-4.0-MA504	4m (157")	33.1
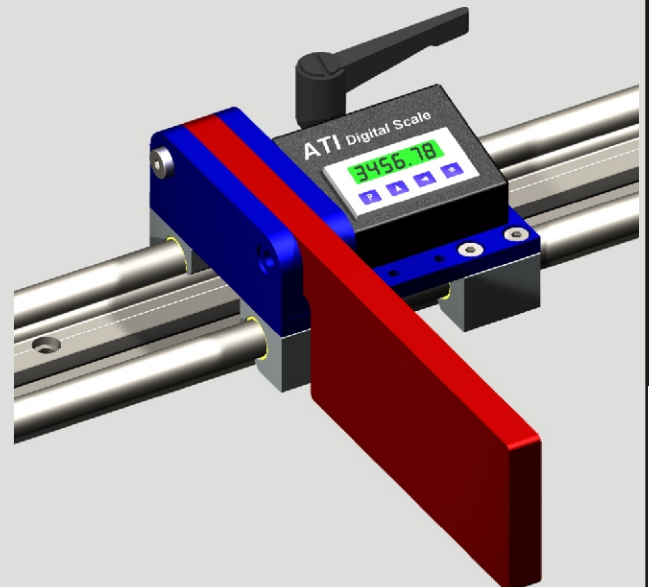
Digital Stop & Fence

MPS2-Digital Length Stop & Fence

- Sturdy aluminum guide profile with machined aluminum parts
- Display resolution to 3 decimal places for inch and 2 decimal places for metric readout
- Measuring length from 1 to 8.5 meters (3 to 28 ft)
- Order any Custom Lengths up to 28 feet
- Single or Multiple Stop Heads with Lock
- 6 month battery life with 1 "AA" cell
- Decimal and fractional display mode
- Use for Left or Right Infeed System
- Large, easy to read LCD display
- Inch or Metric readout
- Gang Stops Available
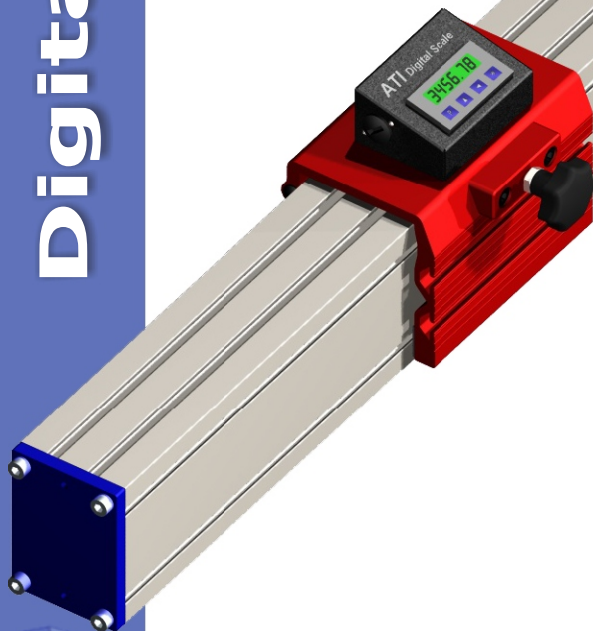
MA504 DISPLAY & Flip Stop

Decimal and fractional display mode
1/64" display resolution in fractional
0.001" display resolution in decimal inch
0.01mm display resolution in metric
**User replaceable battery**
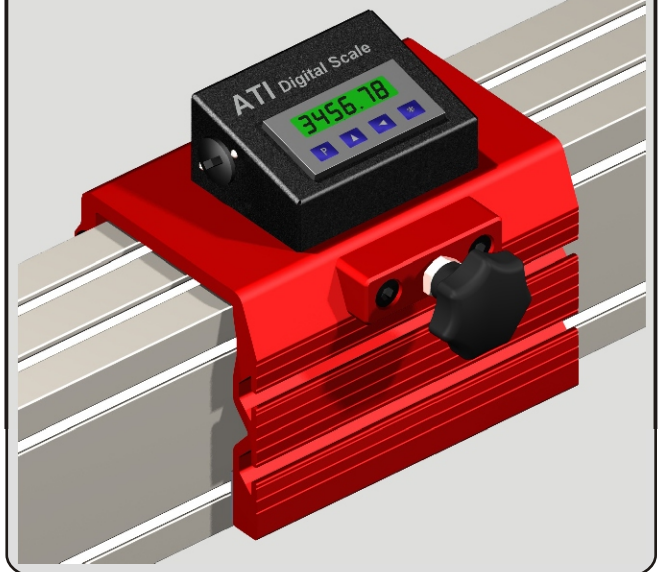
Technical Data

## STOP SYSTEM WITH FLAT OR ROLLER TABLE

- Heavy Duty 12 Gauge Steel Construction
- Adjustable Height: 32 - 42 inch
- Micro Adjust Feet with Flour Anchoring
- Available Table Lengths: 6 & 8 Feet
- Combinations Available up to 28 Feet
- Roller Length: 18 inch
- Urethane Coded Rollers
- Durable Powder Coating
- Standard Colors: White & Green
- Custom Colors Available
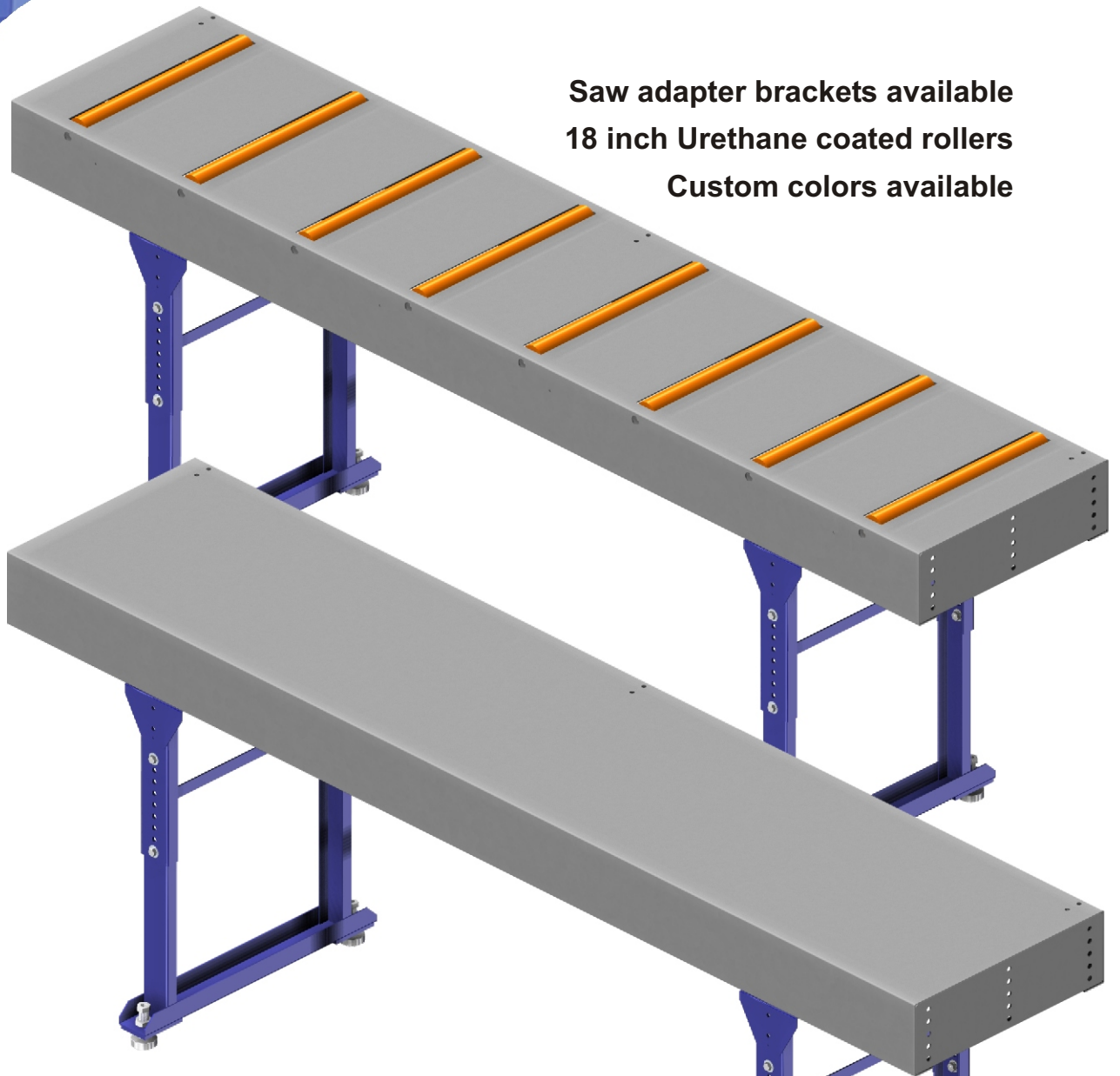- Saw Adapter Brackets Available
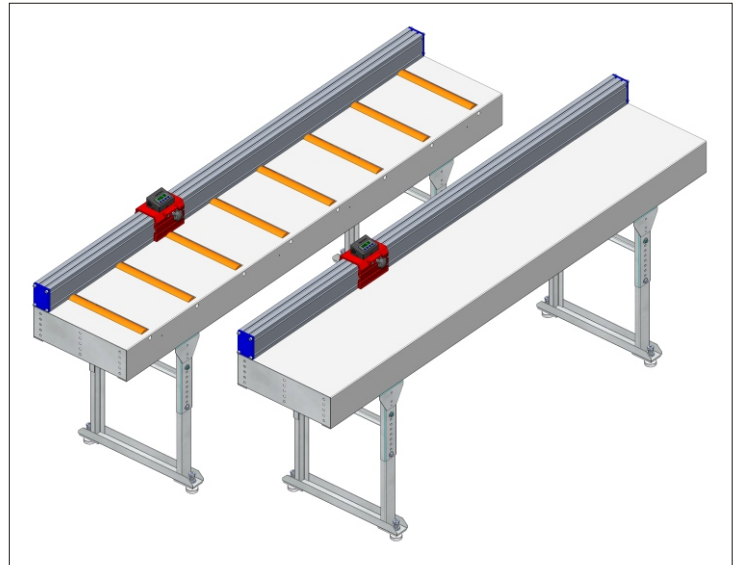
ROLLER TABLE
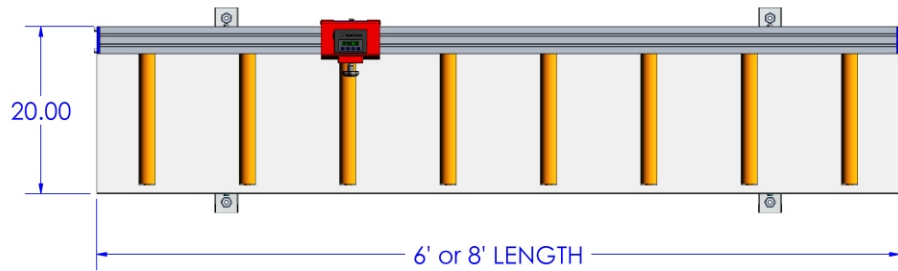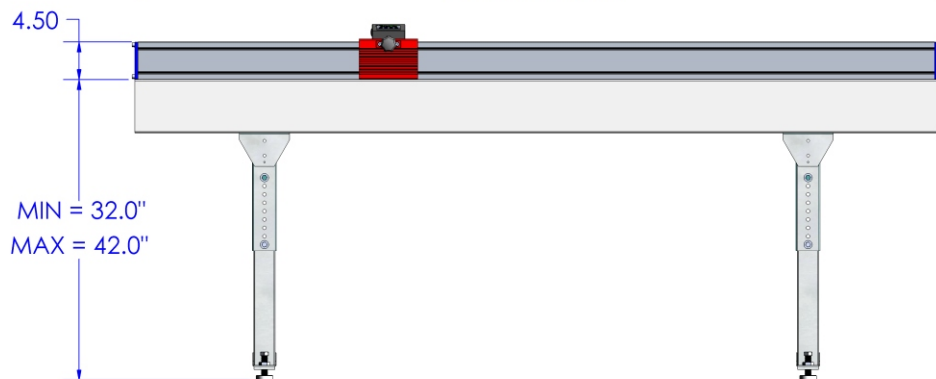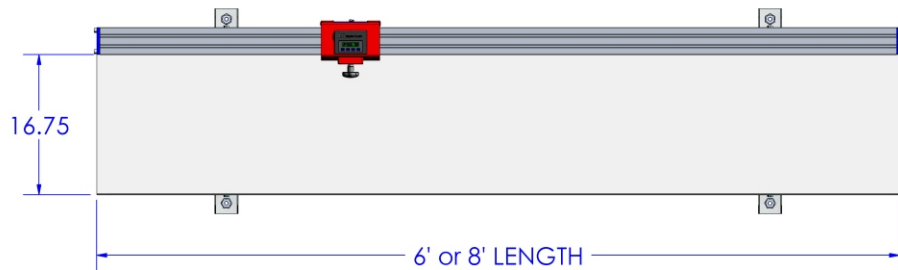
20.00

6' or 8' LENGTH

FLAT TABLE

16.75

6' or 8' LENGTH

4.50

MIN = 32.0"
MAX = 42.0"

24.50

Roller & Flat Tables

Saw adapter brackets available

18 inch Urethane coated rollers

Custom colors available

Heavy Duty 12 Gauge Steel Construction

Durable Powder Coating

Available Lengths: 6 & 8 feet

Adjustable Height: 35 - 41 inch

Micro Adjustable Feet with Bolt Down

Leveling Pad
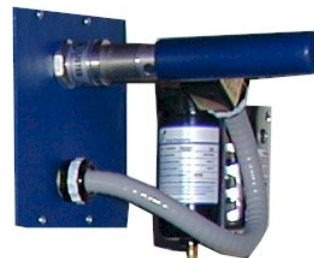
Bolt together any combination of lengths
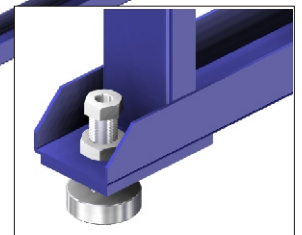
Bolt Down Micro Adjust Feet
with Leveling Pads

Accessories

Filter Fan Enclosure Cooler
Model: FF-018

✂ Provides optimum climate in enclosure
✂ Very low noise
✂ Airflow: 24 CFM
✂ Power Consumption: 15Watt
✂ User replaceable filter media

Vortex Cooler
Model: TCCK-4225

Includes water/oil filter and thermostat. The vortex cooler creates positive air pressure in the enclosure keeping dust and debris from entering air holes. The vortex cooler also emits cool air to protect your PC, controller and monitor from overheating. An electric thermostat allows the cooler to run only when the temperature exceeds a preset value to avoid wasting compressed air.

Thermal Label Printer
Model: 2742-DTLP

The optional direct thermal label printer allows the TPS[3] Positioner to print labels as the product is cut. This gives the operator quick identification of the products that are cut and the necessary information to prevent loss or mistakes at later assembly stations

Barcode Scanner
Model: SP-302/SP-370

Barcode scanner allows for quick pattern access in production environments. Also used at "Binsoft Workstations" to track products at various stages of assembly.
SP-302: with cable
SP-370: wireless