

INSTRUCTION MANUAL

July 2020

CNC QUILTER



INSTRUCTION MANUAL

ABM Internationa	l, Inc.	

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1. OPERATOR SCREENS

Operator Technician	Lock
Machine Not Initial	IZED
The machine must be initialized before	e operation.
Initialize	
Control Information Sewing Speed (spm) Frame:	Statistics Chart Export
Pattern: Inches of sewing:	Hourly Production
440 Estimated run time: Estimated bobbin remaining: 0.000 in.	
2200 Sewing Progress	
1.764%	
	<u>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 </u>
Clear Fault Reset Bobbin	Chart Options

Figure 1.1 – Initialize Screen

When the machine is started the first screen is the initialize screen. The machine must be initialized prior to operation. When the Initialize button is pressed the machine will find the zero position for each axis. First the foot motor will move to find its proximity sensor and set zero. The needle will cycle to find an encoder marker and move to the up position. The X and Y axis will move to the front left most point where the proximity sensors are located. Once the X and Y sensors are tripped the X and Y axis will move to the offset position and set zero. Any sewing fixtures need to be removed from the clamps prior to initializing the machine.

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Operator Technician	Unlock
Not In Position	1
The machine is not in a safe starting position. Please remove the frame and p	ress the Home button to move to the correct position.
Control Information	Statistics
Sewing Speed (spm) Frame: Pattern: Inches of sewing: Inches of sewing: I	Chart Export Hourly Production

Figure 1.2 – Not In Position Screen

The machine must be moved to the common starting point prior to starting sewing. This position where the needle is half way between the frame lock clamps and the clamps are seven inches back from the needle. A sewing fixture must not be in the clamps when making this move.

-

Operator Technician		Lock
	Load Frame	LUCK
	Please scan the barcode of the frame you wish to load.	
	Çş	
Control Sewing Speed (spm) 440 2200 2200 Clear Fault Reset Bobbin	Information Statistics Frame: Patern: Inches of sewing: Estimated run time: Estimated run time: Mourly Production Sewing Progress 1.764%	0 0 4 5

Figure 1.3 – Load Frame

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Once the machine is initialized and in the starting position a fixture can be loaded. Scan the fixture then place it into the clamps and press the frame lock button. If there is only one pattern assigned to the frame it will automatically be loaded. If there are multiple patterns assigned to a frame the operator will be prompted to select one.

Operator Technician			Lock
	Select Pattern		
	x x x x x x x x x x x x x x x x x x x		
Cancel	Page 1 of 1 Previous	Next	ЭК
Control	Information	Statistics	
Sewing Speed (spm) 440 2200	Frame: 25X16 INSIDE AREA NO ARCS Pattem: Inches of sewing: Estimated run time: Estimated bobbin remaining: 0.000 in.	Chart Export Hourly Production	
2200 Ctear Fault Reset Bobbin	Sewing Progress 0%	0 0 0 0 0 0 0 0 9 10 11 12 1 2 3 Chart Options	0 4 5

Figure 1.4 – Select Pattern

All of the patterns that have been imported to the scanned frame will be displayed. A pattern is selected by pressing it then pressing OK.

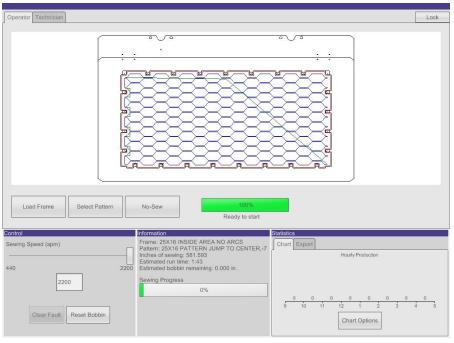


Figure 1.5 - Sew Screen

After the pattern is done loading the machine can be started using the start button and stopped with the stop button. The Load Frame button will take make the Load Frame screen appear allowing for a new frame to be scanned and loaded. The select pattern button can be used to choose a different pattern if there is more than one assigned to the current frame. The No-Sew button can be used to disable the sew head. The slider in the lower left of the screen adjusts the sewing speed. By pressing on the sewing speed box a speed can be typed in using an onscreen keypad. The Reset Bobbin button can be used if the bobbin check is setup. The Information box shows basic information about the current frame, pattern and sewing progress.

Fault Recovery

A fault can occur for reasons such as: an estop button is pressed, a limit is exceeded, an axis goes down, or a connection is lost between the controller and a drive. In the event of a fault the machine will stop all motion and turn off all of the outputs. A message will be displayed in the Information section of the screen. In order to recover from a fault the condition causing the fault must be fixed and the Clear Fault button in the lower left Control section of the screen must be pressed. After recovering from a fault the machine must initialize again.

Statistics

In the lower right corner of the screen is the Statistics section. Pressing the Chart Options button can configure the chart. The chart can be grouped by Hour, Day or Week. It can either display all patterns sewn or just one based on a selection and the completion status. The data can also be exported to a USB drive using the Export option.

2. TECHNICIAN SCREENS

To enter the technician screens the machine must be unlocked by pressing the lock/unlock button in the upper right corner of the screen. An onscreen keyboard will appear to type in the password. By default there is no password. To lock the machine the lock/unlock button is pressed again.

Operator Technician	Lock
Setup Machine Settings Status Inputs Outputs Jog Needle Foot Encoder Che	eck Password Exit To Windows
Fram	es
	import
16X18 INSIDE ARE, 17X15 INSIDE ARE, 25X16 IN	SIDE ARE.
	Delete
Page 1 of 1 Previous N	ext
Control Information	Statistics
Sewing Speed (spm) Patien: Patien: Patien: Patien: Patien: Patien: Patien: Patien: Patien: Estimated run time: Estimated bobbin remaining: 0.000 i	Chart Export Hourly Production
2200 Sewing Progress 0%	0 0 0 0 0 0 0 0 0 10 11 12 1 2 3 4 3 Chart Options

Figure 2.1 – Frames

The frames screen is used to manage the frames on the machine. A frame can be selected by highlighting it. The settings button can be used to change the settings of the selected frame. The patterns button will switch to the pattern management screen for the selected frame. The delete button can be used to delete selected frames. The Import button will switch to the import frames screen.

Operator Technician	Lock
Setup Machine Settings Status Inputs Outputs Jog Needle Foot Encoder Check Password Exit To Windows	
Import Frames	
Select USB Drive:	
E:\	
NF FULL FRAME 3 SEGMENTS.dxf	2
SEARAY 49.5 X 29.5 FRAME PLINE INSIDE.dxf	
16X18 INSIDE AREA NO ARCS.dxf	
16X18 PATTERN JUMP TO CENTER7.dxf	
17X15 INSIDE AREA NO ARCS.dxf	
17X15 INSIDE AREA NO ARCS.001 17X15 PATTERN JUMP TO CENTER,-7 SHORT Y.dxf	
25X4 4 16 3PCS PATTERN JUMP TO CENTER, -7.dxf	
25X16 INSIDE AREA NO ARCS.dxf	
25X16 PATTERN JUMP TO CENTER7.dxf	
FOOT RECLASE	
Back Select All Import	
Control Information Statistics	
Sewing Speed (spm) Frame: Chart Export	
Pattern:	
Inches of sewing: Hourly Production Estimated run time:	
440 2200 Estimated bobbin remaining: 0.000 in.	
2200 Sewing Progress	
0%	
	0
9 10 11 12 1 2 3 4	5
Clear Fault Reset Bobbin Chart Options	

Figure 2.2 – Import Frames

A USB drive can be placed in the port on the right side of the operator panel. The drawings must be placed directly on the root of the drive (not in any folders). The drive letter is selected using the drop down menu. The .dxf files on the drive will be displayed and multiple files can be selected at once by tapping on the file name. Files can be unselected by tapping them a second time. When the import button is pressed the selected frames will be imported. If a file fails to import a message will appear along with the files name.

Operator Technician	Lock
Setup Machine Settings Status Inputs Outputs Jog Needle Foot Encoder Check Passw	ord Exit To Windows
Frame: 25X16 INSIDE ARE	A NO ARCS
Image: State of the s	
Back	
Control Information	Statistics
Sewing Speed (spm) Frame: Pattern: Patt	Chart Export Hourly Production
2200 Sewing Progress 0%	0 0 0 0 0 0 0 0 0 9 10 11 12 1 2 3 4 5 Chart Options

Figure 2.3 – Frame Settings

From the frame settings screen the name of the frame and the barcode can be changed. The barcode can be typed in manually or scanned by pressing the Scan Barcode button and scanning the barcode.

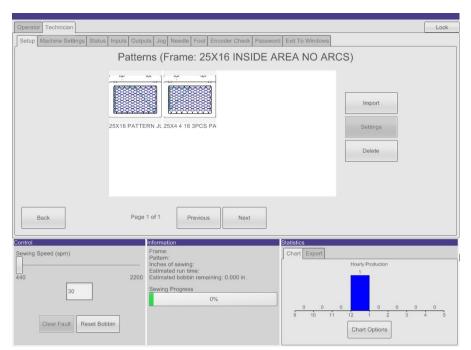


Figure 2.4 – Patterns

The patterns screen is used to manage the patterns assigned to each frame. The import button will open the Import Patterns Screen. The import patterns screen operates the same way that the Import Frames

screen does. The settings button will open the Pattern Settings screen. Settings for the back tack, back tack length and *(the other setting)* can be changed here or set to use the machine setting. The delete button can be used to delete selected patterns.

Operator Technician Lock Setup Machine Settings Status Inputs Ouputs Jog Needle Foot Encoder Check Password Exit To Windows Maximum Sewing Speed (Cont.): 2200 spm Wiper: On Off Maximum Sewing Speed (Interm.): 1500 spm Aux Foot: On Off Back Tack Length: 0 in. On Off On Off Number of Back Tacks: 0 in. Inc. Stitches Per Inch: 6.5 Set Set Full Bobbin Length: 0 in. (0=disabled) ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Frame: (6X18 PATTERN JUJMP TO CENTER, 7 Set/stides Frame: (6X18 PATTERN JUJMP TO CENTER, 7 Hourly Productor 440 2200 Sewing Progress Sewing Progress Set/stide Set/stide Hourly Productor							
Maximum Sewing Speed (cont.): 2200 spm Wiper: On Or Maximum Sewing Speed (Interm.): 1500 spm Aux Foot: On Or Back Tack Length: 0 in. On Or Or But State 0 in. On Or Or Stitches Per Inch: 6.5 in. On Or Full Bobbin Length: 0 in. (0=disabled) Thread Break Threshold: 200 ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Statistics Centrol Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409, 126 Fourth Export Hourly Production 440 2200 Estimated bobbin remaining: 0.000 in. Hourly Production Hourly Production	Operator Technician						Lock
Maximum Sewing Speed (Interm.): 1500 spm Aux Foot: On Off Back Tack Length: 0 in. Number of Back Tacks: 0 Stitches Per Inch: 6.5 Full Bobbin Length: 0 in. (0=disabled) Thread Break Threshold: 200 ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Frame: 15X18 COMPLETE WITH INSIDE AREA, Pattern: 15X18 PATTERN. JUMP TO CENTER, 7 Hoches of sewing: 409, 126 Estimated bobbin remaining: 0.000 in.	Setup Machine Settings Status Inp	uts Outputs Jog	Needle Foot Encode	r Check Password	Exit To Windows		
Maximum Sewing Speed (Interm.): 1500 spm Aux Foot: On Off Back Tack Length: 0 in. Number of Back Tacks: 0 Stitches Per Inch: 6.5 Full Bobbin Length: 0 in. (0=disabled) Thread Break Threshold: 200 ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Frame: 15X18 COMPLETE WITH INSIDE AREA, Pattern: 15X18 PATTERN. JUMP TO CENTER, 7 Hoches of sewing: 409, 126 Estimated bobbin remaining: 0.000 in.							
Maximum Sewing Speed (Interm.): 1500 spm Aux Foot: On Off Back Tack Length: 0 in. in. On Off Number of Back Tacks: 0 Stitches Per Inch: 6.5 Inc. Full Bobbin Length: 0 in. (0=disabled) Inc. Thread Break Threshold: 200 ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN, JUMP TO CENTER, 7 Inches of sewing: 409, 126 Statistics 440 2200 Estimated bobbin remaining: 0.000 in. Hourly Production	Maximum Sewing Speed (Cont.):	2200 spm		Wiper:		On Off	
Back Tack Length: D in. Number of Back Tacks: 0 Stitches Per Inch: 6.5 Full Bobbin Length: 0 Inread Break Threshold: 200 Stote Speed (spm) Intermittent	Maximum Sewing Speed (Interm.):	1500 spm					
Number of Back Tacks: 0 Stitches Per Inch: 6.5 Full Bobbin Length: 0 in. (0=disabled) Thread Break Threshold: 200 200 ms (0=disabled) Motion Type: Continuous Calibrate Offset Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN, JUMP TO CENTER, 7 Inches of sewing: 409, 126 Estimated bobbin remaining: 0.000 in.				Aux Foot:		On Off	
Stitches Per Inch: 6.5 Full Bobbin Length: 0 in. (0=disabled) Thread Break Threshold: 200 ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Control Frame: 16X18 COMPLETE WITH INSIDE AREA Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN, VIUMP TO CENTER, 7 Inches of sewing: 409, 126 Estimated bobbin remaining: 0.000 in.	Back Tack Length:	0 in.					
Full Bobbin Length: 0 in. (0=disabled) Thread Break Threshold: 200 ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Control Information Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409.126 Estimated bobbin remaining: 0.000 in. Statistics	Number of Back Tacks:	0					
Full Bobbin Length: 0 in. (0=disabled) Thread Break Threshold: 200 ms (0=disabled) Motion Type: Continuous Intermittent Calibrate Offset Control Information Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409.126 Estimated bobbin remaining: 0.000 in. Statistics	Stitches Per Inch:	6.5					
Intermittent Statistics Control Information Control Information Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409, 126 Estimated bobbin remaining: 0.000 in. Chart							
Motion Type: Continuous Intermittent Calibrate Offset Information Statistics Control Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409, 126 Estimated bobbin remaining: 0.000 in. Statistics	Full Bobbin Length:	0 in. (0=d	sabled)				
Control Contro	Thread Break Threshold:	200 ms (0=c	isabled)				
Control Information Sewing Speed (spm) 	Motion Type:	Continuour	Intermitteet				
Control Information Statistics Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409.126 Estimated bobbin remaining: 0.000 in. Chart Export 440 2200 Estimated bobbin remaining: 0.000 in. Hourly Production		Continuous	internitterit				
Control Information Statistics Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER.7 Inches of sewing: 409.126 Estimated bobbin remaining: 0.000 in. Chart Export 440 2200 Estimated bobbin remaining: 0.000 in. Hourly Production	Outburk Officer						
Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER,-7 Inches of sewing: 409.126 Estimated bobbin remaining: 0.000 in.	Calibrate Offset						
Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER,-7 Inches of sewing: 409.126 Estimated rout time: 1:12 Estimated bobbin remaining: 0.000 in.							
Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER,-7 Inches of sewing: 409.126 Estimated rout time: 1:12 Estimated bobbin remaining: 0.000 in.							
Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER,-7 Inches of sewing: 409.126 Estimated toobin remaining: 0.000 In. Hourly Production	Control	Inform	ation		Statistics		
Inches of sewing: 409,126 Hourly Production Estimated rout lime: 1:12 Estimated bobbin remaining: 0.000 in.	Sewing Speed (spm)	Frame	16X18 COMPLETE WIT	TH INSIDE AREA	Chart Export		
440 2200 Estimated bobbin remaining: 0.000 in.		Inche	of sewing: 409.126	P TO CENTER,-7		Hourly Production	
	440			000 in.			
	2200						
0%	2200						
					0 0	0 0 0 0 0	0
Clear Fault Reset Bobbin	Clear Fault Reset Bobbin				8 10 1		4 5
Chart Options]				Chart Options	

Figure 2.5 – Machine Settings

Continuous or Intermittent motion can be selected from this screen. Using intermittent motion the frame will only move when the needle is out of the material. The Maximum sewing speed can be set for both types of motion. The minimum speed that the machine will run is 150 SPM. Settings for stitches per inch, back tack, bobbin check and thread break can also be set here. The outputs for the Wiper and Aux Foot can be enabled or disabled here.

Operator Technician		Lock
Setup Machine Settings Status Inputs Outp	uts Jog Needle Foot Encoder Check Password	·
Setup Machine Setungs Status Inputs 2	uis Jug Needle Foot Encoder Check Fassword	EXITO WINDOWS
Sewing		e locked
Suspended		Y limit exceeded
Thread break enabled		ize not complete
Thread break detected		t or fault expecting reset
Y axis servo fault		m fault
Needle axis fault		
Foot fault		in empty Ifset out of range
XY initialized		er error
Sew head initialized		art position
Con ligad initialized	M AL SI	ar position
Control		Statistics
Sewing Speed (spm)	Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER,-7	Chart Export
	Inches of sewing: 409.126	Hourly Production
440 2200	Estimated run time: 1:12 Estimated bobbin remaining: 0.000 in.	
2200	Sewing Progress	
2200	0%	
		0 0 0 0 0 0 0 0 0 9 10 11 12 1 2 3 4 5
Clear Fault Reset Bobbin		9 10 11 12 1 2 3 4 5
Reset Bobbin		Chart Options

Figure 2.6 – Status

The status screen shows the current state of the bits in the status register.

Operator Technician		Lock
Setup Machine Settings Status Inputs Outp	uts Jog Needle Foot Encoder Check Password	Exit To Windows
X Limit Left Y Limit Front Foot Limit Thread Break E Stop Left E Stop Right E Stop Center	Home PB Restart PB Bobbin PE Start PB Stop PB	8
Control	Information	Statistics
Sewing Speed (spm)	Frame: Pattern:	Chart Export
	Inches of sewing:	Hourly Production
440 2200	Estimated run time: Estimated bobbin remaining: 0.000 in.	1
30	Sewing Progress 0%	
	0%	0 0 0 0 0 0 0
		9 10 11 12 1 2 3 4 5
Clear Fault Reset Bobbin		
		Chart Options
		<u> </u>

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Figure 2.7 – Inputs

The Inputs screen shows the state of the inputs.

Operator Technician									Lock
Setup Machine Setting	s Status In	puts Outpu	ts Jog Needle Fo	ot Encoder Check	Password	Exit To Windows			
Frame Lock	Set	Clear]		Top Air	Set	Clear		
Plate	Set	Clear]		Bottom Air	Set	Clear		
Thread Cut	Set	Clear]		Wiper	Set	Clear		
Thread Tension]		Aux Foot				
Clamp	Set	Clear]	_		Set	Clear		
	Set	Clear							
ontrol			Information		c	Statistics			
Sewing Speed (spm)			Frame: Pattern:			Chart Export			
440		2200	Inches of sewing: Estimated run time: Estimated bobbin re	maining: 0.000 in.			Hourly Produc	tion	
30			Sewing Progress	0%					
			-			0 0 9 10 1	0 0	0 0	0 4 5
Clear Fault	Reset Bobbin						Chart Optio	ons	

Figure 2.8 – Outputs

The Outputs screen has buttons to set and clear each of the outputs. The check boxes indicate the status of the output.

Operator Technician		Lock
	s Outputs Jog Neer e Foot Encoder Check Password Exit To Windows Jog RPM:	
Control Sewing Speed (spm) 440 2200 Ctear Fault Reset Bobbin	Information Statistics Information Complete WITH INSIDE AREA Pattern: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER,-7 Estimated run time: 1:12 Estimated bobbin remaining: 0.000 in. Sewing Progress 0% 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 5

Figure 2.9 – Jog

The jog screen consists of controls to jog the frame. The speed can be changed by tapping the Jog RPM box and typing in a new speed.

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	<u> </u>
Operator Technician	Lock
Setup Machine Settings Status Inputs Outputs Jog Needle - Encoder Check Password Exit To Windows	
Jog RPM:	
- Jac Nacilla	
30 Jog Needle	
Set Needle Up Go To Needle Up	
Control Information Statistics	
Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Chart Export	
Pattern: 16X18 PATTERN JUMP TO CENTER,-7 Inches of sewing: 409.126 Hourly Production	
Estimated run time: 1:12	
440 2200 Estimated bobbin remaining: 0.000 in.	
2200 Sewing Progress	
0%	
	0
Clear Fault Reset Bobbin	2
Chart Options Chart Options	

Figure 2.10 – Needle

Consists of controls to jog the needle, go to needle up and set needle up. The set needle up button will make the current position of the needle the up position.

Operator Technician	Lock
Setup Machine Settings Status Inputs Outputs Jog Needle Foot Encoder Check Password Exit To Windows	
Seruh Machine Serungs Status inputs Outputs 30g readie Foot Enclose Flassword Exit to Windows	
Collision Area	
Raise Foot Enable Needle	
+ Load Drawing	
Lower Foot Disable Needle	
Set Sew Position Set Up Position	
Set Sew Position Set Up Position	
	C3
Go To Sew Position Go To Up Position Go To Down Position	
Control Information Statistics	
Sewing Speed (spm) Frame: Chart Export	
Inches of sewing: Hourly Production	
440 Estimated run time: Estimated bobbin remaining: 0.000 in.	
2200 Sewing Progress	
2200 Sewing Progress	
	0 0
	4 5
Clear Fault Reset Bobbin Chart Options	

Figure 2.11 - Foot

The foot screen has controls for moving the foot, positioning the foot, setting the positions, and loading a drawing for the outline of the foot. The sew position is the position that the foot will be in when sewing, up position is where the foot is at its highest position.

To set the sew position the foot should be jogged to the expected position and then the Set Sew Position button is pressed. This will overwrite the previous sew position setting.

To set the up position the Set Up Position button is pressed. The needle will be moved to the up position and the foot will be moved to zero and disabled. The cover over the foot servomotor is removed. The shaft of the motor then needs to be rotated to the mechanical maximum height for the foot. With the shaft is held at the highest position the Set Up Position button is pressed. This sets the maximum foot height for the machine and overwrites the old setting.

A drawing of the outline of the foot can be imported using the Load Drawing button. The procedure for loading the foot outline is the same as loading frames and patterns.

Operator Technician	Lock
Setup Machine Settings Status Inputs Outputs Jog Needle Foot Encoder Check Password Exit To Windows	
Disable X X Position: 599057	
Disable Y Y Position: -102174	
Disable Z Z Position: 158	
Control Information Statistics	
Pattem: 16X18 PATTERN JUMP TO CENTER,-7	
Inches of sewing: 409.126 Hourly Production Estimated run time: 1:12	
440 2200 Estimated bobbin remaining: 0.000 in.	
2200 Sewing Progress	
0%	
	0
Clear Fault Reset Bobbin	3
Chart Options	

Figure 2.12 – Encoder Check

In this screen the X, Y, and Needle motors can be disabled and enabled. The value of the encoders is displayed.

-

Operator Technician		Lock
	Its Jog Needle Foot Encoder Check Password Exit To Windows New password: Re-enter new password: Save	
Control Sewing Speed (spm) 440 2200 2200 Clear Fault Reset Bobbin	Information Statistics Frame: 16X18 COMPLETE WITH INSIDE AREA Pattern: 16X18 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409.126 Estimated run time: 112 Estimated run time: 112 Estimated bobbin remaining: 0.000 in. Sewing Progress 0% 0 0 0 0 0 0 0 0 0 9 10 11 12 1 2 3 (Chart Options)	0 4 5

Figure 2.13 – Password

The technician password can be changed.

Operator Technician	Lock
Setup Machine Settings Status Inputs Outputs Jog Needle Foot Encoder Check Password	Exit To Windows
Launch at startup Launch in fullscreen mode	
Control Information Sewing Speed (spm) Frame: 16X18 COMPLETE WITH INSIDE AREA Patter: 16X19 PATTERN JUMP TO CENTER, 7 Inches of sewing: 409.126 Estimated run time: 1:12 Estimated bobbin remaining: 0.000 in.	Statistics Chart Export Hourly Production
2200 Sewing Progress 0%	0 0 0 0 0 0 0 0 0 9 10 11 12 1 2 3 4 5 Chart Options

Figure 2.14 – Exit To Windows In the exit screen the settings for launching the program on startup of the computer and launching in full screen mode are present. The application can be closed from this screen.

Operator Technician		Lock
Setup Machine Settings Status Inputs	Outputs Jog Needle Foot Encoder Check Password Exit To Windows	
	Calibrate XY Offset	
Move To Point	Jog RPM: 5 Left Right Disable Needle Fwd Set Offset Cancel	Enable XY Disable XY
Control	Information Statistics	
Sewing Speed (spm)	Frame: Pattern: Inches of sewing: Estimated run time: Destimated bobbin remaining: 0.000 in. Sewing Progress	duction

Figure 2.15 – Calibrate XY Offset

The Calibrate XY Offset screen is accessed from the Machine Settings screen. Using this screen and the calibration plate the offset can be reset. There is a hole in the center of the calibration plate located directly between the clamps in X and 4 inches from the clamps in Y. With this fixture in the clamps the jogging controls can be used to place the hole in the plate directly below the needle. It is recommended to use a low jog speed when the hole is close to make small adjustments. The Enable and Disable XY buttons can be used to disable the X and Y axis and to move them manually. The Move To Point button will move the fixture to the point based on the current offset. The X and Y axis must be enabled and the frame locked to use the Move To Point and the Jog functions. Once is the hole is directly below the needle the Set Offset button is pressed. After setting the offset the machine must be reinitialized.

3. FRAME CREATION

Frame drawings must be in the form of R2000 through R2013 ASCII .dxf drawing files, have the origin located at center of the left clamp, have a layer named INSIDE_AREA and be drawn to scale in inches. The INSIDE_AREA layer can have only one closed POLYLINE that represents the inside of the frame. The closed POLYLINE must be the only entity on this layer. The POLYLINE can be closed using either the closed property or by making the start and end point the same. The machine will use the inside of the closed POLYLINE on the INSIDE_AREA layer to check if a pattern will fit in the frame before running.

Any other layers and the entities on them will be used for display purposes only. The supported entities that can be used for display purposes are listed below. TEXT can be included but will not be displayed.

Supported entities for Frame drawings: LINE ARC POLYLINE SPLINE ELLIPSE CIRCLE BLOCKS

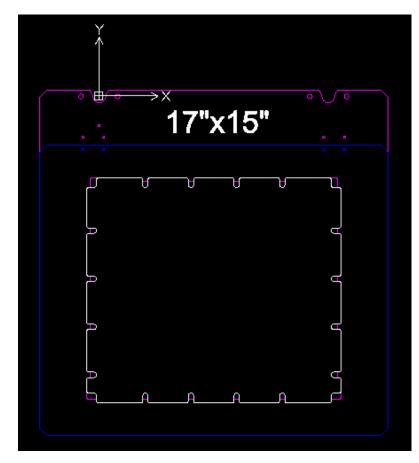
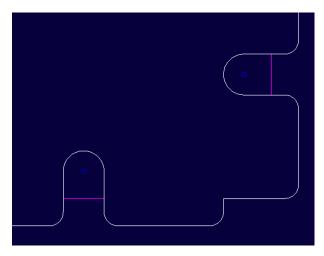


Figure 3.1 – Frame Example

The white shape in the center of the frame is the polyline on the INSIDE_AREA layer. All of the other entities are on separate layers and are only used for display purposes on the machine. The TEXT will not be displayed on the machine. All frames must be in this orientation. The complexity of the INSIDE_AREA layer will dictate how long the keep out zone check will take. On a frame like the one shown in Figure 3.1 the arcs on the inside area layer could be converted into straight lines as shown in Figures 3.2 and 3.3.



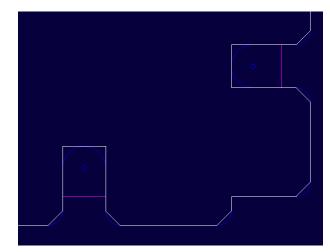


 Figure 3.2 – Outline with arcs
 Figure 3.3 – Outline without arcs

 The outline in Figure 3.2 is the original layout for the INSIDE_AREA layer. The INSIDE_AREA in Figure 3.3 was edited to remove all of the small arcs and decrease the keep out zone check time.

4. PATTERN CREATION

Patterns must be in the form of R2000 through R2013 ASCII .dxf drawing files, have the origin located at center of the left clamp and be drawn to scale in inches. All patterns must be a complete loop starting and ending at the point (7.874,-7.000). Patterns consist of two layers: SEW and NO_SEW. The SEW layer contains the pattern that will be sewn. The NO_SEW layer consists of jump movements that will connect the sew segments and move to the common starting and ending point. The NO_SEW layer should only contain LINE and POLYLINE entities. The .dxf can contain other layers however they will be used for display purposes only.

The supported entities for the SEW layer are: LINE ARC POLYLINE SPLINE ELLIPSE – ELLIPSES must be open (Elliptical Arc) BLOCKS

Any other types of entities must be converted to the supported types in order for the pattern to be imported. An example conversion is with a TEXT entity: in AutoCAD and DraftSight text can be converted to a closed POLYLINE using the command TXTEXP and can then be converted to LINES and ARCS using the EXPLODE command.

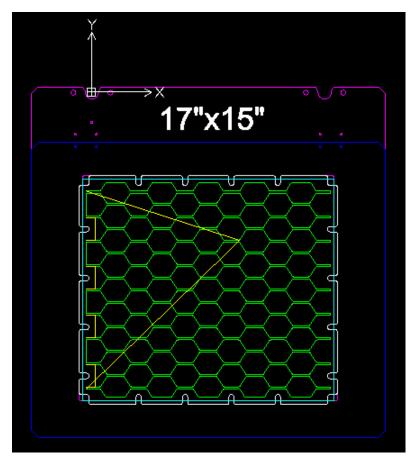
Entities on the SEW layer that are connected end-to-end will be merged into a single continuous sew segment. A thread cut will occur at the end of the sew segment when transitioning to a no-sew segment,

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or at the end of the pattern. The machine will also check before starting a new sew segment that there is enough bobbin thread to complete that segment. When designing the pattern, one should ensure that no single sew segment exceeds the length of a full bobbin, accounting for variations in length. A sew segment that is too long can be broken up by separating two points by a very small amount and connecting the two points with a NO_SEW line.

Sew segments can be stacked on top of one another to sew a segment multiple times. The NO_SEW jumps must start and end on the same points as the segments they are connecting. For patterns imported with "Automatic" stitch placement, back tacks are configured in the machine and pattern settings and do not need to be included in the drawing. For patterns imported with "Predefined" stitch placement, the SEW layer should only contain POLYLINE entities, where each point of the polyline is is the location of a stitch hole. Back tacks must be a part of the drawing for "Predefined" patterns.





The green entities make up the sew segments on the SEW layer. The yellow lines define the jumps on the NO_SEW layer. Note how the NO_SEW moves are used to move around the protrusions in the frame.

5. FOOT OUTLINE CREATION

Foot Outline drawings must be in the form of R2000 through R2013 ASCII .dxf drawing files, have the origin located at the needle and be drawn to scale in inches. The outline must be a closed POLYLINE. The POLYLINE can be closed using either the closed property or by making the start and end point the same. The POLYLINE must be the only entity in this drawing. The layer that the outline is on can have any name.

Note: The number of intersections of the outline will dictate how fast the pattern keep out zone will be checked. While the keep out zones only have to be checked once for each pattern and foot combination using a complex foot outline may be prohibitive due to the increased keep out zone check time. Arcs will significantly increase the time needed for the check. It is recommended to keep the Foot Outlines relatively simple. Refer to Figures 5.1 through 5.3 for an example of how to reduce the complexity of the foot outline.

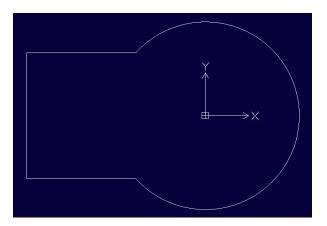


Figure 5.1 – Foot outline

This is a drawing of a foot that represents the actual outline of a foot. Because of the large circular arc section this outline may take a large amount of time to check the keep out zones.

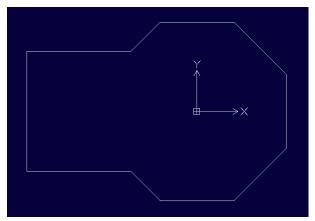


Figure 5.2 - Foot outline without arcs

In this outline the circular portion of the foot was converted to an octagon. This reduces complexity of the outline and the time required to check the keep out zones.

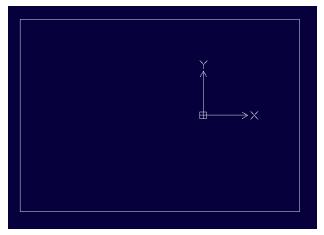


Figure 5.3 – Foot outline rectangle

Here the outline was expanded to be a rectangle, which further reduced the complexity of the drawing and the time required to check the keep out zones. This type of a drawing should work for most configurations.

Here the outline was expanded to be a rectangle, which further reduced the complexity of the drawing and the time required to check the keep out zones. This type of a drawing should work for most configurations.