



SPECTRUM

Operator's Manual



SPECTRUM

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Contents

Introduction..... 1

About the Spectrum Engraver.....1

 About this Manual 1

 Other Information Resources 1

Contacting Customer Support.....2

Technical Information3

 Engraving Speed..... 3

Safety.....4

 Pinch Points / Rotational Hazards..... 4

 Hearing Protection 4

 Cylinder Loading / Unloading..... 4

About Jobs, Cylinders, and Test Cuts.....5

Embedded PC.....5

Machine Controls6

 (A) Power Disconnect Switch 6

 (B) Power On Button..... 7

 (C) Emergency Stop Buttons 7

 (D) USB Port 7

 (E) KVM Switch – Vital Proof equipped machines only..... 7

 (F) Operator Display 7

 (G) Front Carriage Controls..... 8

 (H) Rear Panel 9

Turning ON the Spectrum 11

 From a Cold Start 11

 From a Warm Start 11

Turning OFF the Spectrum.....	12
Complete Power Down – Machine & Embedded PC	12
Machine Only Power Down	12
Restarting the Embedded Computer.....	12
Engraving Procedures	13
Introduction.....	13
Selecting a Cylinder for Engraving.....	15
Previewing a Cylinder.....	18
Zooming Up and Down	18
Measuring	19
Measure Units.....	20
Engraving Using EasyCell Converge – Semi-Automation	21
Flowchart of Engraving using EasyCell Converge and Semi-Automation	24
Engraving Using EasyCell Converge – Semi-Automation with Cylinder Supports.....	25
Flowchart of Engraving using EasyCell Converge and Semi-Automation with Cylinder Supports.....	28
Engraving Using EasyCell Converge – Engrave Automation.....	29
Flowchart of Engraving using EasyCell Converge and Engrave Automation.....	32
Engraving Using QuickCell Converge – Semi-Automation	33
Flowchart of Engraving using QuickCell Converge and Semi-Automation	36
Engraving Using QuickCell Converge – Engrave Automation.....	37
Flowchart of Engraving using QuickCell Converge and Engrave Automation.....	40
Engraving a Job – Manual Procedure.....	41
Flowchart of Engraving using Manual Process.....	44
Loading a Cylinder	45
Loading – Using Operator Display.....	45
Loading – Using Rear Panel Controls	47
Unloading the Cylinder	49
Unloading – Using Operator Display.....	49
Unloading – Using Rear Controls	51
Truing the Cylinder.....	52
Cleaning the Cylinder	52
Floating the 1 Rev	53
Using Image Drop.....	53
Image Drop for the Production Cylinder.....	53
Image Drop for Testcuts only.....	53
Constant Tone Engraving - Manual Method	54
Constant Tone Engraving - QuickCell Method	56
Manually Measure Cells using the VISTA Camera.....	58
Measuring Cell Sizes with External Microscope.....	59

Converge Routine	60
Common Steps in all Converge Routines	61
Single Cell Locating	61
QuickCell – Continue and Restart	61
Mechanical Carriage Limits	62
Cleaning the Touchscreen.....	63
Operator Display Reference	65
Introduction: Using the Operator Pages	66
Machine Status	67
Color Changes in Windows	67
Color Changes in Buttons.....	68
Entering Values with the Numeric Keypad	69
Page Buttons - Moving From Page To Page	70
Common Action Buttons.....	72
Carriage Position and Menu	72
Carriage Position Menu	72
Exit	72
Zero Position.....	73
Set Engrave Limit	73
Cancel Engrave Limit.....	73
Go To Position.....	73
Carriage Left and Carriage Right	73
Jog Cylinder Up and Jog Cylinder Down.....	74
Start Cylinder Rotation.....	74
Stop Cylinder Rotation	74
Head In	74
Head Retract	74
AC/Vacuum On	74
Float 1 Rev	75
Mid-Tone Correction.....	75
Close/Open Covers	75
Exit Buttons.....	75
Yes/OK, No, Continue, Restart Buttons	76
Screen Page.....	77
Screen/Raster	77
Screen Angle	77
Cylinder Circumference & Cylinder Diameter.....	77
Stylus.....	78
Image Drop	78
Frequency Override – Changing Engraving Speed	78

Cylinder Handling Page	79
Home Carriage	79
Raise/Lower Cylinder Supports.....	80
Open/Close Chucks - AutoChucks	80
Locate AutoChuck	80
Open Stocks and Close Stocks.....	81
Lock/Unlock Stocks	81
Home Stocks	81
Keyway Detect	81
Cylinder Length Measuring	82
Insert/Remove Arbors/Cones into Chucks.....	82
TIR Measurement	82
Run Semi-Automation.....	82
Resume Semi-Automation	82
Perform Load	83
Perform Unload	83
Cell Setup Page	85
Target Values	86
Measured Values	86
Change Values.....	86
Scum Dot.....	86
Image Drop – Test Cuts Only.....	87
Tip Cal	87
Perform Test Cuts	87
Find Test Cut	87
Learn a Screen.....	88
Clear Displayed Values.....	88
VISTA Page.....	89
Video Display Area	89
Measure Functions.....	89
Changing Target Value	90
Gap / Cell Height	90
Measurement Controls	91
Movement	92
Line Select	92
Alternative Methods for Moving Cursors	92
Exit	92
Live Video Toggle	93
Converge.....	93
VISTA Calibration	93
Perform Test Cuts	93
Midtone Testcut.....	93
Save Image	93

Converge Page	94
Start Converge - EasyCell or QuickCell.....	94
View Nested Full	94
View Stripe Full	95
View Channel	95
View Highlight.....	95
Start Mid-tone – Can be either EasyCell or QuickCell.....	95
View Light Mid-tone	95
View Heavy Mid-tone	95
Change EasyCell Converge to QuickCell.....	96
Restarting QuickCell.....	96
VISTA Calibration Menu	97
Light Calibration.....	97
Auto Focus	97
Manual Focus In.....	98
Manual Focus Out.....	98
Focus Distance	98
Shoe Move	98
Burr Cutter	98
Camera Vertical Position	98
Camera Horizontal Position	98
Burr Cutter Alignment Menu	99
Move Burr Cutter.....	99
Burr Cutter Offset	99
Measure Currents Page	100
Black Current	100
White Current	100
Current Scale.....	101
Read Currents	101
Balance Currents.....	101
Mid-Tone Correction Page	102
Test Block Values	102
Target Values	102
Measured Values	103
Change Values	103
Perform Test Cuts	103
Find Test Cut	103
Clear Displayed Values.....	103
Mid-Tone Enabled.....	103
3-Point Curve Example.....	104
4-Point Curve Example.....	105

Engrave Page	106
Load Job	106
Toggle Job List.....	107
Select Source.....	108
Refresh	108
Job Successfully Loaded	109
Cylinder Information.....	109
Close Job	110
Preview Cylinder	110
Job Notes	110
Testcut – EasyCell or QuickCell	111
Run Semi-Automation.....	111
Engrave Start.....	111
Engrave Stop	112
Sequence Engraving (Over-Engraving)	112
Real-Time Video	113
Engraving Status.....	113
Log Page	114
Learn Table / Stylus Life Page	115
Learn Table.....	115
Erase Functions	116
Stylus Life Table.....	116
Information Table	116
Selecting a Stylus for Tracking	117
Adding a Stylus to the Table	117
Removing a Stylus from the Table	117
Tune Page.....	119
Exit Software	121
Engrave Head Operation	123
Overview	123
Engrave Head Diamonds.....	123
Sliding Shoe.....	123
Sliding Shoe Installation and Replacement.....	123
Stylus.....	125
Stylus Installation and Replacement.....	125
Burr Cutter	127
Burr Cutter Installation and Replacement	128
Burr Cutter Alignment.....	128
Burr Cutter Setup Hints.....	130
Pivot Pin	132
Frequency Override – Changing Engraving Speed	133

Engrave Head Operation - *continued*

Vacuum Bag Replacement 135
 Changing the Engrave Head Air Filters..... 136

Miscellaneous 137

Manually Focusing the Vista System 137

Aligning and Calibrating the Vista System Camera 139

Camera Alignment 139
 Alignment of the VISTA Camera 140
 Camera Magnification Calibration 143

OHIO Dashboard 145

Birth Certificate..... 145
 Using the OHIO Dashboard 146
 Basic Information on Main Window 147
 Daily Window Information..... 147
 Weekly and Monthly Window Information 148
 Dashboard Settings..... 148

Hardware (HW) Debugger 151

What It Does 151
 Hardware Debugger..... 151
 Sensor Description 152
 Enclosure Diagnostics 153
 Stocks Diagnostics..... 154
 Carriage Diagnostics 156
 Engrave Head Diagnostics..... 157

Using the Vital Proof System™ 159

Introduction 159
 Toggling Between Engrave Interface and Vital Proof 160
 Using the Vital Proof System..... 160
 The Parts of the Vital Proof Interface 161
 About the Panes 161
 The Main Buttons..... 162
 Display: Proof Data 162
 Display: Difference Data 162
 Panning 162
 Zoom In 162
 Zoom Out 163
 Zoom to the whole image..... 163
 Status and Errors..... 163
 Birth Certificate..... 164
 Using the Vital Proof Viewer 164



Introduction

About the Spectrum Engraver

The Spectrum is a semi-automated engraver. With optional features, the Spectrum can be a fully-automated engraver integrated into an automated plating/finishing/engraving line. It works with the Collage Layout System which supplies job and image data via a network connection or from a CD/DVD.

The operator controls the engraver using a graphical user interface. A built-in camera provides automatic and semi-automatic cell setup and the ability to view cells during engraving.

About this Manual

This Operator's Manual contains information on the function and operation of the Spectrum. This manual is intended for operators trained by Ohio GT; it is a reference manual, not a tutorial workbook. The manual contains the following sections:

- Chapter 1* General Information
- Chapter 2* Engraving Procedures
- Chapter 3* Operator Display Reference
- Chapter 4* Engrave Head Operation
- Chapter 5* Miscellaneous: Adjusting the VISTA® System Camera, Using the OHIO Dashboard
- Chapter 6* Using the Vital Proof System (optional)

This manual does not include information on configuration or maintenance.

Every effort has been made to ensure the accuracy of the information in this manual. Please contact Customer Support to report any errors or suggestions for improving this manual.

Other Information Resources

OHIO maintains a website with an ever-growing knowledge base. On the OHIO website you can find the latest manuals as well as videos and online tutorials on using various functions and features. In addition, Customer Information Bulletins presenting the latest news on features can be found here. We encourage you to visit our website periodically to see what is new!

Visit: <https://ohiogt.com/train/catalog.html>

Contacting Customer Support

Contact your local sales or service agent if you have any questions or problems with your engraver. You can also contact the Ohio GT Customer Support.

In the USA contact the Ohio GT Customer Support Department between 8:00 a.m. and 5:00 p.m. (EST USA) Monday through Friday:

Telephone: +1 937-439-1589

Email: service@ohiogt.com

Technical Information

The Spectrum is available in several sizes: Compact, Packaging, Decorative, and Large Format. The cylinder type accepted can be either integral shaft or shaftless (tube) based on machine fixturing.

The Compact unit is available with direct cones only (shaftless cylinders).

The Packaging, Decorative and Large Format are available with the following cylinder fixturing options:

- Direct cones (integral shaft and shaftless capable)
- 3-Jaw or 4-Jaw chucks (integral shaft capable) with independently adjustable jaws
- Cones & Arbors (placed into the chucks for shaftless capability)
- 3-Jaw automated chucks (integral shaft capable) without independently adjustable jaws
Optional equipment

Please consult your Ohio GT sales representative for engraver size and cylinder size information for your specific machine, or visit the Ohio GT website at www.ohiogt.com

Engraving Speed

The Spectrum is equipped with the VISION 3 engrave head as standard equipment. There are several different models of VISION 3 head. Each head is capable of at least three engraving depths. Your specific tunes are based on your production requirements and were set during manufacturing. The following chart shows the speeds and depths for normal tunes.

Head Type	Engraving Depth	Engraving Speed	
VISION 3	Cells depths to 35µm	8600 Hz.	Standard
	Cells depths to 63µm	8100 Hz.	Standard
	Cells depths to 70µm	3200 Hz.	Standard
	Cells depths to 90µm (Impact)	1700 Hz.	<i>Optional</i>
	tranScribe	4500 Hz.	<i>Optional</i>
	Hybrid to 60µm depth (extended to 90µm depth if purchased with Impact option)	Variable rate, based on depth	<i>Optional</i>
High Output Head*	Cells depths from 100 to 130µm	2000 Hz.	<i>Optional</i>
High Output Hybrid Head*	Hybrid depths from 100 to 130µm	1300 Hz.	<i>Optional</i>
Mega Extreme Depth Head*	Cells up to 300µm deep!	800 Hz.	<i>Optional</i>

Specialty heads may be used depending on your applications. Please consult your Ohio GT sales representative for additional information.

*These Specialty heads require removing the VISION 3 head and replacing with the Specialty head.

Safety

The Spectrum engraver is equipped with safeguards and interlocks, but as with any industrial equipment the possibility of injury always exists. Read the following warnings before operating the engraver.

Pinch Points / Rotational Hazards

WARNING! Rotating and moving equipment can cause serious injury.

Rotating and moving components can pinch hands or grab loose clothing and jewelry. Use extra care when you are working near the following areas of the engraver:

- ❖ Headstock and Tailstock, including chucks, cones and arbors, and auto-chuck power drives – Rotating Hazard
- ❖ Auto-chucks (*optional*) – Pinch and Rotating Hazard
- ❖ Engrave Carriage – Pinch Hazard
- ❖ Head Lift – Pinch Hazard
- ❖ Telescoping enclosures – Pinch Hazard
- ❖ Cylinder supports (*optional*) – Pinch Hazard
- ❖ Cylinder piers (*optional*) – Pinch Hazard

Hearing Protection

WARNING! Wear hearing protection when operating the engraver.

The Spectrum machine uses a high-speed engrave head that presents a noise hazard. Ohio GT *strongly recommends* the use of earplugs or over-the-head ear muffs anytime the engraver's vacuum and engrave head are turned on. Whenever possible keep the engraver doors closed during engraving.

Cylinder Loading / Unloading

WARNING! Secure the cylinder before loading or unloading the cylinder.

When loading a cylinder into the engraver, do not release the cylinder from the hoist until you have completely secured the cylinder in the chucks or cones. Releasing the cylinder too soon could cause the cylinder to fall, resulting in personal injury or damage to the engraver.

When unloading a cylinder from the engraver, the cylinder must be secured with a hoist before releasing the cylinder and moving the headstock and tailstock away. Opening the chucks and moving the stocks too soon could cause the cylinder to fall, resulting in personal injury or damage to the engraver.

If your machine is equipped with optional cylinder supports, use the supports to hold the cylinder during cylinder loading and unloading. These position the cylinder at the proper position for loading and unloading.

About Jobs, Cylinders, and Test Cuts

A job is created on a layout system, such as the Collage Layout System. In addition to the cylinder layout, the Collage operator also specifies the cylinder size, screen and angle for the cylinder (or all cylinders in the job), test cut parameters, and other information.

After the layout operator sets the job Ready for Print, the cylinders in the job are available for engraving. (Note: The layout operator typically refers to a "job" as a collection of cylinders. Frequently, an engraver operator means a single cylinder when the term "job" is used.)

The Spectrum includes a built-in RTI (Real-Time Interface) for generating engraving data. You, the engraver operator, select the job to engrave on the operator touchscreen and then start the engraving. Information about a job is displayed on the screen, such as the cylinder size, screen and angle. After you select the job to be engraved, it is downloaded to the Spectrum. The name of the job displays on the Engrave page of the Spectrum's touchscreen.

Test cuts are made before engraving the production cylinder to ensure the proper cell sizes are met. The Spectrum can perform the cuts automatically – EasyCell – or the operator can be involved through the use of QuickCell or Manual test cuts.

Embedded PC

The Spectrum has an embedded computer, or PC, on-board the engraver. This PC has two primary functions:

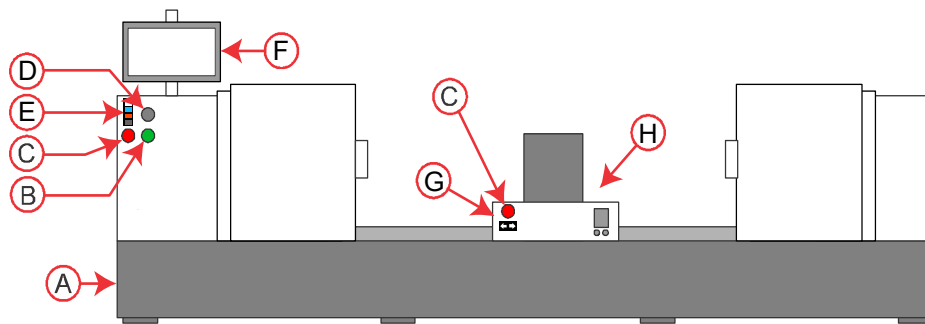
- ❖ To control the engraver
- ❖ To act as an RTI, processing the image data

The PC is not controlled by the Emergency Stop switches and has its own power source. The PC will continue to run even with the engraver turned off. The PC can be turned off through the use of the Spectrum application software.

Note: The power disconnect switch removes power from both the engraver and the PC. Follow proper shut-down procedures before using the power disconnect switch.

A UPS, also on-board, provides temporary battery back-up for the embedded PC only in the event of a power failure or voltage drop. This UPS will not keep the engraver running.

Machine Controls



- A Power Disconnect Switch – On back of machine
- B Power On button
- C Emergency Stop Buttons
- D USB Port
- E KVM selector (for displaying Vital Proof information)
- F Operator Display
- G Front Carriage Control Panel
- H Rear Control Panel – on back of carriage

Important! If you power down the engraver, wait at least 60 seconds before turning power back on.

(A) Power Disconnect Switch



The Power Disconnect switch disconnects all power to the engraver. The disconnect switch is designed with a slot to accommodate proper lock-out/tag-out procedures for servicing the equipment. The Power Disconnect switch is located on the rear of the engraver near the floor.

WARNING! Unless the power is disconnected at the source – a circuit breaker or fuse box – you should always consider the disconnect switch to be powered.

I on the disconnect switch indicates power is connected to the electronics panel and the machine can be turned on.

O on the disconnect switch indicates power is removed from the electronics panel and the machine cannot be turned on.

(B) Power On Button

Press the Power ON button to start the engraver only. The PC can be powered ON even when the engraver power is turned OFF.

Note: The Power Disconnect switch must be in the I position and the Emergency Stop switches unlocked for the Power ON button to power on the machine.



(C) Emergency Stop Buttons

Emergency stop buttons are located near the monitor, on the front carriage control panel, and on the rear carriage control panel.

To power off the engraver, press an Emergency Stop button. The button locks when pressed.

To restart the engraver, you must first release the Emergency Stop by turning it clockwise, as indicated by the arrows on the button.

(D) USB Port

Located above the Power On button is an auxiliary USB port. This port can be used for reading engrave ready jobs – Ready for Print – from a USB Flash/Thumb Drive. The engraver automatically recognizes the Flash drive and adds this to the Job Source list. The Job Source is found on the Engrave page.

The USB can also be used to backup and restore machine configurations.

(E) KVM Switch – Vital Proof equipped machines only

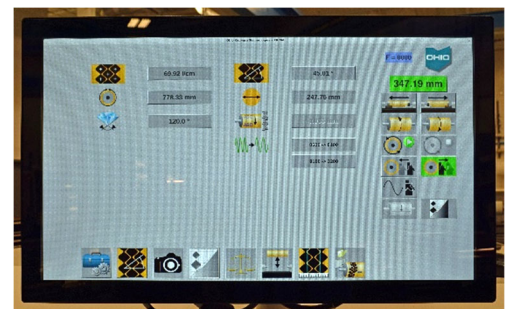
The Vital Proof feature adds a second computer to the engraver. This KVM switch – Keyboard, Video, Mouse – allows one keyboard, mouse and monitor to be used for both computers. Pressing the appropriate button toggles the display between the Embedded GUI for the engraver and the Vital Proof GUI and also activates the keyboard and mouse for that app.

(F) Operator Display

The monitor displays the user interface of the machine.

This is a touchscreen so machine interaction is performed by touching the display. The touchpad on the front carriage control panel is a second way to interact with the user interface to control the engraver.

This monitor also supports the Vital-Proof feature (optional). See KVM switch above for more information.



(G) Front Carriage Controls

The carriage controls are on the front of the machine and are only accessible when the covers are open.

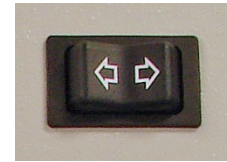
The following controls are available:

- an emergency stop button
- a rocker switch to move the carriage left or right
- a touch pad to interact with the user interface



Move Carriage

Both the front and rear control pods include a switch to move the carriage left or right.



Touch Pad

The touch pad works like a touch pad on a laptop. Use the touch pad or the touchscreen monitor to interact with the user interface.

Move your finger on the touchpad to move the arrow cursor on the monitor.

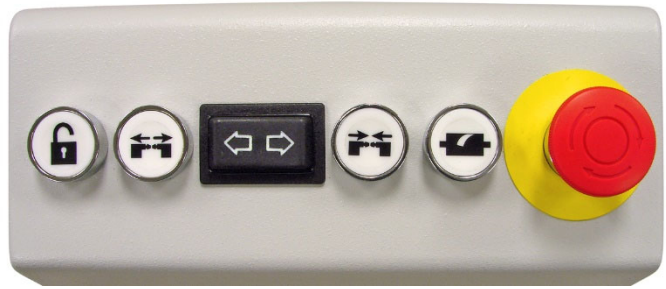
Select by positioning the cursor arrow over the button and clicking the left button on the touchpad or with a tap of the touchpad.



(H) Rear Panel

The rear panel is on the back of the carriage and is only accessible when the covers are open.

It includes the following controls:



- The Unlock button – Press and hold this button when using either of the move stocks buttons.
- Two Stock Move buttons (must also hold the Unlock button while pressing a move button).
 - Press the ARROWS OUT button to move the stocks away from the center.
 - Press the ARROWS IN button to move the stocks towards the center.
- A dual-purpose Clean button rotate the cylinder.
 - Cylinder Cleaning – Press and release to start the cylinder rotating for the purpose of cleaning the cylinder. Press and release a second time to stop cylinder rotation.
 - Cylinder Jog – Press and hold to rotate the cylinder slowly for checking the run-out of the cylinder. As long as the button is held, the cylinder turns at a slow speed.
- A rocker switch to move the carriage left or right.
- An emergency stop button.

Turning ON the Spectrum

From a Cold Start

Use this procedure when all power has been removed from the machine (embedded PC is turned off).

1. Rotate the Power Disconnect switch to the 'I' ON position.
2. Ensure all Emergency Stop buttons are released.
3. Power up the machine by pressing the Power ON button.

The PC starts automatically and takes several minutes to boot up. Boot-up is complete when the desktop and program icons display.

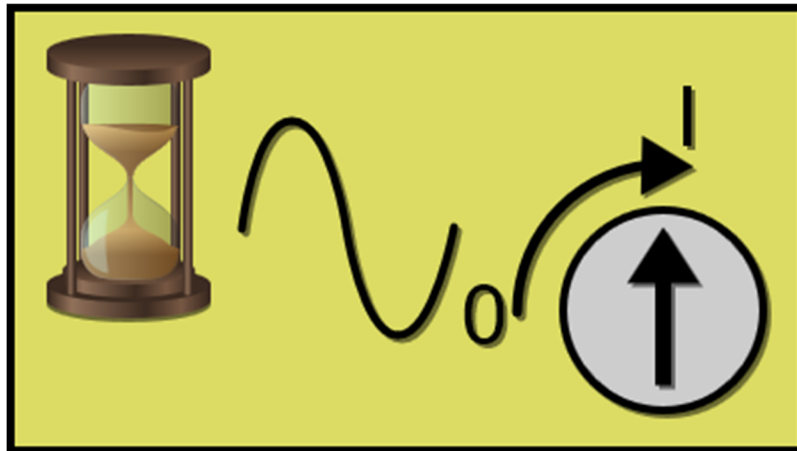
5. The Spectrum operator interface starts automatically during boot-up.

If the interface fails to start, double tap the Embedded icon on the touchscreen. The Spectrum interface starts and configures the machine for operation.

The machine is ready for use when the 'Screen' page is shown.

From a Warm Start

Use this procedure when the machine is turned off but the embedded PC is running. The window shown below is displayed in this condition.



1. Release the Emergency Stop button if necessary. Power up the machine by pressing the Power ON button.
2. The Spectrum application software starts automatically and configures the machine for operation.

The machine is ready for use when the 'Engrave' page is shown.

Turning OFF the Spectrum

Complete Power Down – Machine & Embedded PC

Use this procedure to turn off both the Spectrum and embedded PC.



1. Open the Utilities menu bar.



2. Select the Prompt icon.



3. Touch the Shutdown icon to power down the embedded PC in the Spectrum. The PC conducts an orderly shutdown.

4. Turn OFF the Spectrum by pressing the Emergency Stop button.

5. Rotate the Power Disconnect Switch to the 'O' OFF position to completely remove power to the electronics of the Spectrum. This is not a common situation.

Use the *From a Cold Start* instructions to restart the Spectrum and embedded PC.

Machine Only Power Down

Use this procedure to turn off the Spectrum only. The embedded PC will continue to run.

1. Turn OFF the Spectrum by pressing an Emergency Stop button.

Use the *From a Warm Start* instructions to restart the Spectrum and application software

Restarting the Embedded Computer

Use this procedure to reset the PC.



6. Open the Utilities menu bar.



7. Select the Prompt icon.



8. Touch the Restart icon to restart the embedded PC in the Spectrum. The PC conducts an orderly shutdown and then restart. When finished, the desktop and icons are shown, as well as the Spectrum application software.



Engraving Procedures

Introduction

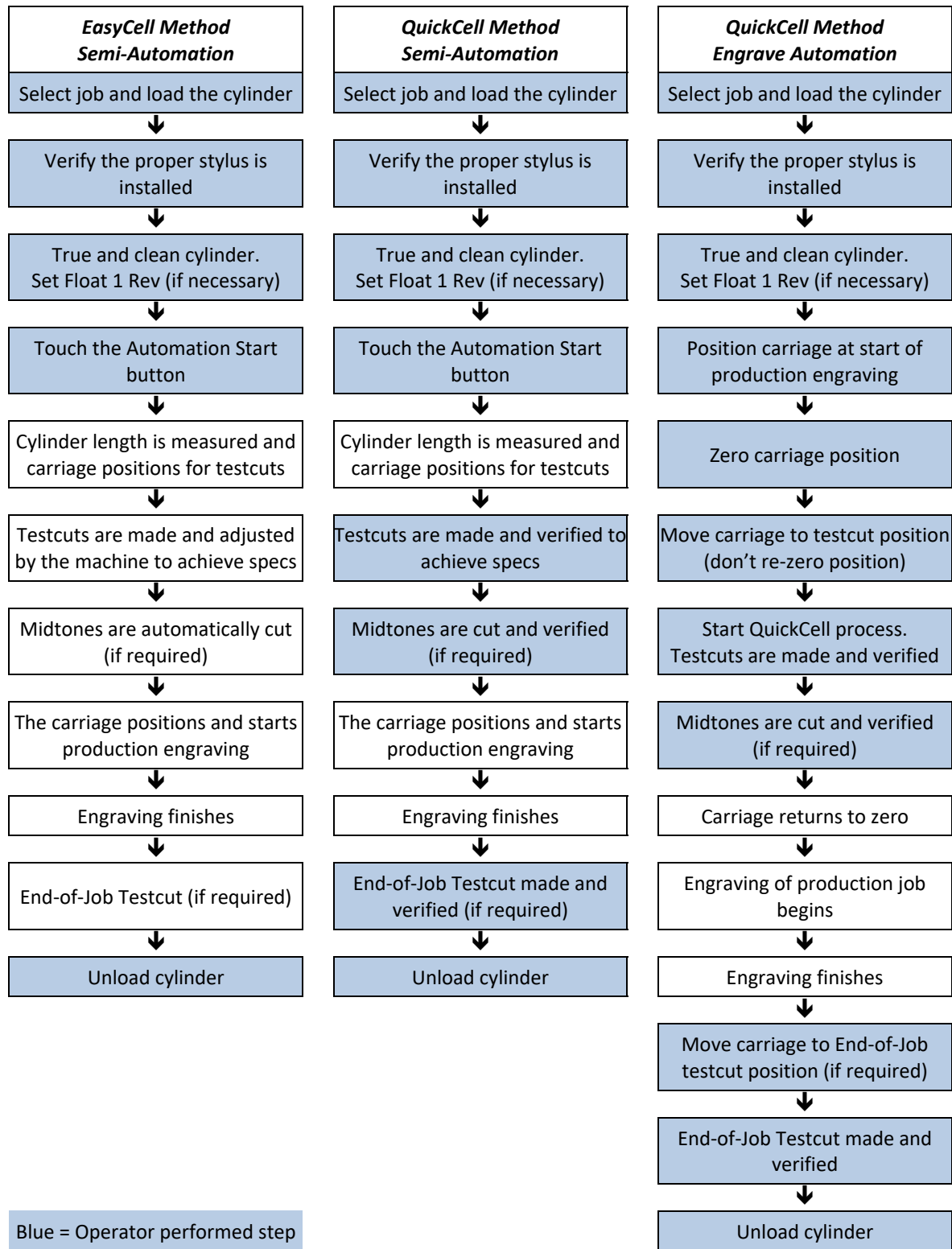
This chapter provides step-by-step procedures for various operations on the Spectrum engraver, including engraving a cylinder. Generally, cylinder production involves the steps shown in the following flowcharts. This is a greatly simplified workflow but identifies the primary steps in the process.

This chapter also includes information about engraving constant tone cylinders, in-progress cylinder inspection, and the methods of relocating the circumferential engraving start.

About Automated Vista

All Spectrum engravers are equipped with the Vista system for semi-automatic and fully-automatic testcut setup. The testcut setup is also called a 'converge'.

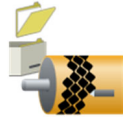
This document provides instructions for engraving with EasyCell for fully automatic testcut setup, QuickCell for semi-auto testcut setup, and also instructions for performing steps manually.



Selecting a Cylinder for Engraving

You must select a cylinder, sometimes called a job, before engraving can occur. Engraving information – cylinder size, screen and screen angle, etc. – are included in the job. Use the following instructions for selecting a job for engraving.

1. Unload the previous cylinder as described in *Unloading a Cylinder* on page 56.



2. Open the Engrave page to select a cylinder for engraving. If the previous cylinder is still selected, un-select it now.



3. Touch the Select Job button to open a list of jobs available for engraving. These can include jobs found on Collage, a CD and a USB flash drive depending on the source. Collage is the default source.



To change the job source, touch the Select Source button and select the appropriate location for the job you need.

Note: This page may take several seconds to display so be patient.

The list shows the job name, which more commonly is a number for tracking in a companies system. This job name is actually a folder and the cylinders making up the job are found inside.

When you open the Job List again, the position is remembered so that you do not have to scroll as often when engraving all cylinders in a job.

- a) Use the Up/Down buttons to move through the job list and locate the correct job. Only jobs with cylinders still to be engraved are displayed. In addition to the job name, the cylinder circumference and diameter used in the job are shown.



K-AutoTest	959.15	305.31
K012017	721.38	229.62
K020518 9 DC	719.76	229.11
K022818	957.56	304.80
K042417	720.16	229.24
K091117	959.55	305.43
K11072016	706.86	225.00
K11072018	720.32	229.29
K22102018	959.15	305.31
KATP12"	971.60	309.27
KATP9"	718.17	228.60
MiamiValley 1up	279.40	88.94
PrATP 12	963.54	306.71
PrATP 9 17-32	718.82	228.81
PrATP 9 81	712.53	226.81
PrATP 9 81_CodySEQ	957.03	304.63
PrATP 9.7 17-32	775.62	246.89
PrATP-SO 9	718.82	228.81
TBK--9in	718.17	228.60

- b) Select a job name to display the cylinders in the job. The cylinders are indented. The black text color indicating they have not been engraved.

K-AutoTest	959.15	305.31		
K012017	721.38	229.62		
K020518 9 DC	719.76	229.11		
K022818	957.56	304.80		
K042417	720.16	229.24		
K091117	959.55	305.43		
K11072016	706.86	225.00		
K11072018	720.32	229.29		
K22102018	959.15	305.31		
K22102018.B	70/45	Cold Seal	120°	0:43
K22102018.C	70/60	Magenta	120°	0:44
K22102018.D	70/37	Black	120°	0:43
K22102018.E	70/45	Yellow	120°	0:43
K22102018.F	70/60	Spot 1	120°	0:44
K22102018.G	80/37	Spot 2	120°	0:57
K22102018.H	80/45	80/45°	120°	0:57
K22102018.I	80/60	80/60°	120°	0:57
K22102018.J	70/37	70/37°	120°	0:43



- c) Select a cylinder from the list and tap OK.

The cylinder begins downloading and is finished when the screen colour changes from yellow to blue.

When all cylinders in a job are engraved, the job is no longer shown on the job list. The same is true of cylinders in a job, so if a job has six cylinders and two have been engraved, only the four remaining cylinders are shown in the job.



Jobs and cylinders that have already been engraved can be viewed using the Toggle Jobs button. Completed jobs and engraved cylinders are shown in grey text rather than black. Once the list is closed, it returns to only showing jobs and cylinders still to be engraved.

K-AutoTest	959.15	305.31		
K012017	721.38	229.62		
K020518 9 DC	719.76	229.11		
K022818	957.56	304.80		
K042417	720.16	229.24		
K091117	959.55	305.43		
K11072016	706.86	225.00		
K11072018	720.32	229.29		
K22102018	959.15	305.31		
K22102018.A	70/37	70/37°	120°	0:43
K22102018.B	70/45	70/45°	120°	0:43
K22102018.C	70/60	70/60°	120°	0:44
K22102018.D	70/37	70/37°	120°	0:43
K22102018.E	70/45	70/45°	120°	0:43
K22102018.F	70/60	70/60°	120°	0:44
K22102018.G	80/37	80/37°	120°	0:57
K22102018.H	80/45	80/45°	120°	0:57
K22102018.I	80/60	80/60°	120°	0:57

Cylinders that are part of a sequenced group, which can also be called over-engraving, are identified by a number in parenthesis. In the following graphic the first cylinder in the selected job has (2) behind the name. This indicates a sequenced group with two engraving passes being made on one cylinder. This permits multiple screens/images on one cylinder in registration with each other. This is often used on

black/key cylinders where one screen is used for the linework for text clarity and a second screen used for the process image to avoid moiré.

K091117	959.55	305.43			
K11072016	706.86	225.00			
K11072018	720.32	229.29			
K11122018	712.53	226.81			
PrATP 9 81.A (2)	60/38	60/37°	120°	0:01	
└PrATP 9 81.B	70/30	69/30°	120°	0:02	
PrATP 9 81.C	70/34	69/33°	120°	0:02	
PrATP 9 81.D	70/45	69/44°	120°	0:02	
PrATP 9 81.E	70/60	69/60°	120°	0:02	
K22102018	959.15	305.31			
KATP12"	971.60	309.27			
KATP9"	718.17	228.60			

As part of the sequence group, the second cylinder in the sequence is shown with a L symbol left of the name, showing the connection between the first and second cylinder.

Sequenced engraving sets are created in the Collage system. Please see the Collage online help on the Collage workstation for information. Additional information can also be found on the OHIO website, www.ohiogt.com



- The loaded cylinder can now be previewed if desired. Touch the Preview button to display the cylinder for reviewing the image. See *Previewing a Cylinder* on page 18.

Note: Only the first cylinder in a sequenced group can be viewed.

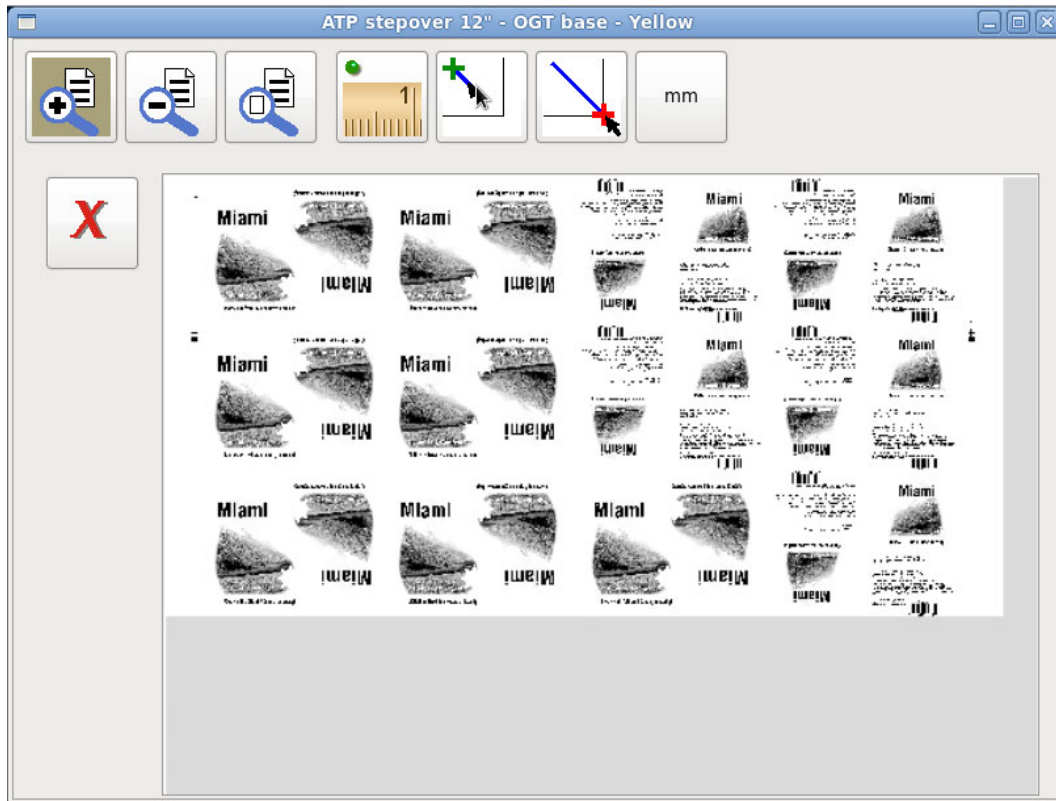
- Verify the screen, screen angle, cylinder size and stylus angle are correct for the job using the data shown across the top of the Engrave page.


Note: If the wrong job was selected, press the Un-Select button, then press the Select button to again show the job list and select the proper cylinder.

Previewing a Cylinder

To use the job preview function:

1. With a job loaded, touch the Preview button. A separate window opens. While the image is being loaded, a progress dialog displays. When loaded, the image displays in the preview window:



To close the Preview window, touch the Exit button. 

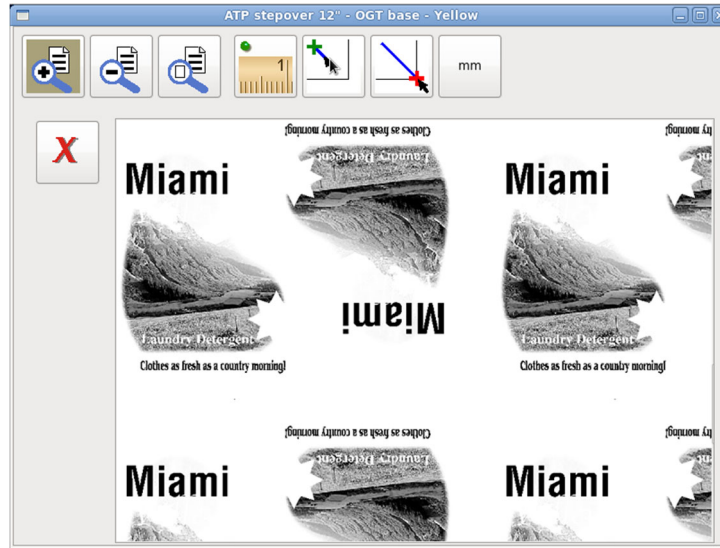
Note: Previewing a Hybrid job is slower than an AC job. Please be aware this can take considerably more time.

Zooming Up and Down



To zoom up on the image, drag a rectangle around the area you want to see: touch the screen at the top left corner and drag down to the right to define the area to enlarge.

A rectangle displays to show you the area, but the rectangle goes away when you lift your finger. The view changes to show just the part inside that rectangle. This function can be repeated as necessary to enlarge the image multiple times.



To return to the previous view, touch the Zoom Down button. Each time you touch this button, it displays the previous view until the Top view (the entire cylinder) is displayed.



To view the entire cylinder, touch the Zoom Top button.

Measuring

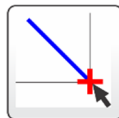


Measure the distance between two points on the preview image.



1. To start Measure Mode, touch the Measure button. The next three buttons become active.

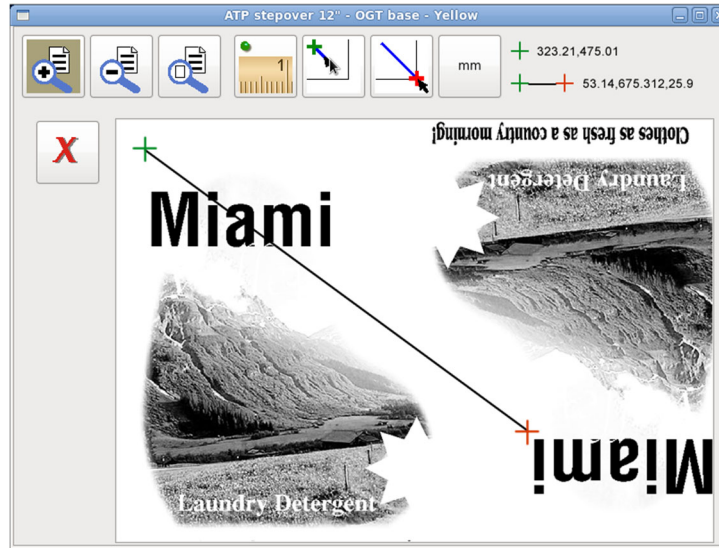
2. To set the start point, touch the Measure Start button, then touch the first point you want to measure from. A green + displays at that point.



3. To set the end point, touch the Measure Stop button, then touch the end point. A red + displays at that point, with a line between the two points.

The measurement displays at the top of the window:

- ❖ The top values show the coordinates of the start point – the green +.
- ❖ The lower values show the distance to the end point – the red +. These values are:
 - X Distance
 - Y Distance
 - Point to Point Distance



To exit Measure Mode, touch the Measure button again.

Measure Units



To change the measure units, touch the button to toggle between mm, cm and inch.
The display of the measure distances changes instantly to the new units.

Engraving Using EasyCell Converge – Semi-Automation

The EasyCell Converge is a machine-controlled testcut process to achieve cell specifications. The machine begins engraving the production cylinder when completed. A process flowchart is shown on page 24.

Semi-Automation performs all setup and engraving functions automatically – the operator only loads the cylinder into the machine. The machine confirms the cylinder face length using end-seeking and positions the carriage for testcuts and production engraving. Positioning parameters are entered in the Collage job.

These instructions also explain what happens with Sequenced Cylinders. Sequenced Groups are created in Collage and combine two or more cylinders into one cylinder. Each cylinder can have different engraving screen/screen angles.

Select the Job for Engraving



Start this process with the machine idle and no cylinder installed.

1. From the Engrave page, select the cylinder for engraving. See *Downloading a Job* on page 15.

Stylus Angle

2. Verify the correct stylus angle is installed in the engraver. The machine prompts you to change the stylus if the wrong angle is installed. If necessary, change the stylus.

Load Cylinder into Machine

3. Refer to *Loading a Cylinder* on page 45.

True the Cylinder

4. Verify cylinder run-out and correct if necessary.

Align Circumferential Start with Keyway

5. Set the image drop or float the 1-Rev, if necessary, as described in *Floating the 1-Rev* and *Setting the Image Drop* on page 53.

Start EasyCell Converge



6. Return to the Engrave page. Press the Run Semi-Automation button to start the sequence.
7. The engraver moves the carriage to the Home position, lowers the head against the cylinder, then raises it to the end-seeking position.
8. End-seeking begins with the carriage moving to the right end of the cylinder. There may be a slight pause as the carriage nears the expected end of the cylinder, this is normal.
Note: The cylinder must be a clean non-engraved cylinder. Using end-seeking on cylinders with engraving may produce false indications of the cylinder end and disrupt the process.
9. When the right end is found, the carriage reverses travel and moves to the left end of the cylinder. Again, a slight pause may occur and this is normal.

10. The cylinder face length is compared against the job parameters. If the length is within tolerance, the machine positions the carriage at the testcut position.
Note: Cylinder Face Length Tolerance is found on the Configuration page:
Automation>Cylinder Face Length Tolerance
This is normally set to 10mm.
11. The EasyCell converge starts automatic setup of cell sizes to the job requirements.
 - a) First the EasyCell sequence performs several sub-routines:
 - Tip calibration (situation dependent)
 - Camera focus to ensure good focus on the cylinder surface
 - Light calibration to compensate for surface reflectivity
 - Check and balance the engrave currents
 - b) Next, a single cell routine to locate the testcut position.
 - c) Testcuts of full and highlight cells are made and measurements are taken of the cell and channel sizes, based on the job information. Additional adjustment cuts are made until the target sizes are achieved.
If difficulties arise with cell measurements, go to step 12. Otherwise go to step 13.

QuickCell Assist with EasyCell Converge

12. Some conditions like soft copper, compressed screens, or small channels make measuring difficult for the VISTA system. If this happens during an EasyCell Converge:



- a) Press the QCell button to interrupt the EasyCell function. The converge routine is now converted to the QuickCell method where the operator verifies the measurements being made. This includes Mid-Tone Correction as well. Be patient after pressing the button, it may take one EasyCell cycle before QuickCell is active.
For additional information on QuickCell, see *Start QuickCell Converge* on page 38.
- b) Verify, and if necessary adjust, all three cell variables.
- c) Press the QCell button to perform another testcut with the needed corrections and verify the resulting cells. Repeat this until the full, highlight and channel are within spec.
- d) When all the sizes are correct, press the Exit button.
- e) Engraving currents are checked. If within the proper range, the cell setup is automatically stored to the Learn Table. Go to step 12f.



- If the currents are out of range, the shoe is repositioned and another set of testcuts are made to verify the new shoe position. The process starts again at step 11a.
- f) A Mid-Tone test cut is made and measured (if called for in Collage job or machine configuration). Verify the size. If out of spec, touch the MidTone QCell button to make an adjustment cut. Press the Exit button when correct. Go to step 15.



EasyCell Converge Finishes



13. Engraving currents are checked when the correct cell sizes are achieved. If within the proper range, the machine goes to step 14.

If the currents are out of range, the shoe is repositioned and testcuts are repeated. After running an auto-focus routine, the process starts again at step 11c.

Mid-tone Correction



14. A mid-tone testcut is automatically made and measured (if called for in Collage job or by machine configuration). The machine measures the mid-tone cells, determines the corrective action required, and turns on the feature.

Carriage Re-positions and Engraving Starts



15. The carriage moves to the start of engraving and the production job begins cutting.

Note: The engraver may not automatically start engraving. If the PAUSE AFTER TESTCUT configuration item is set to YES, the machine waits for the operator to review. To continue, Press the EZCell Complete button.

Engraving Ends

16. When the engraving finishes, the machine can:
 - Stop the cylinder and wait for the operator to unload the cylinder from the machine.
 - Engrave a second 'end-of-job' testcut. This is job dependent and set in Collage.
 - Starts the testcut for the second engraving in a sequenced group. See *Sequenced Engraving* below.

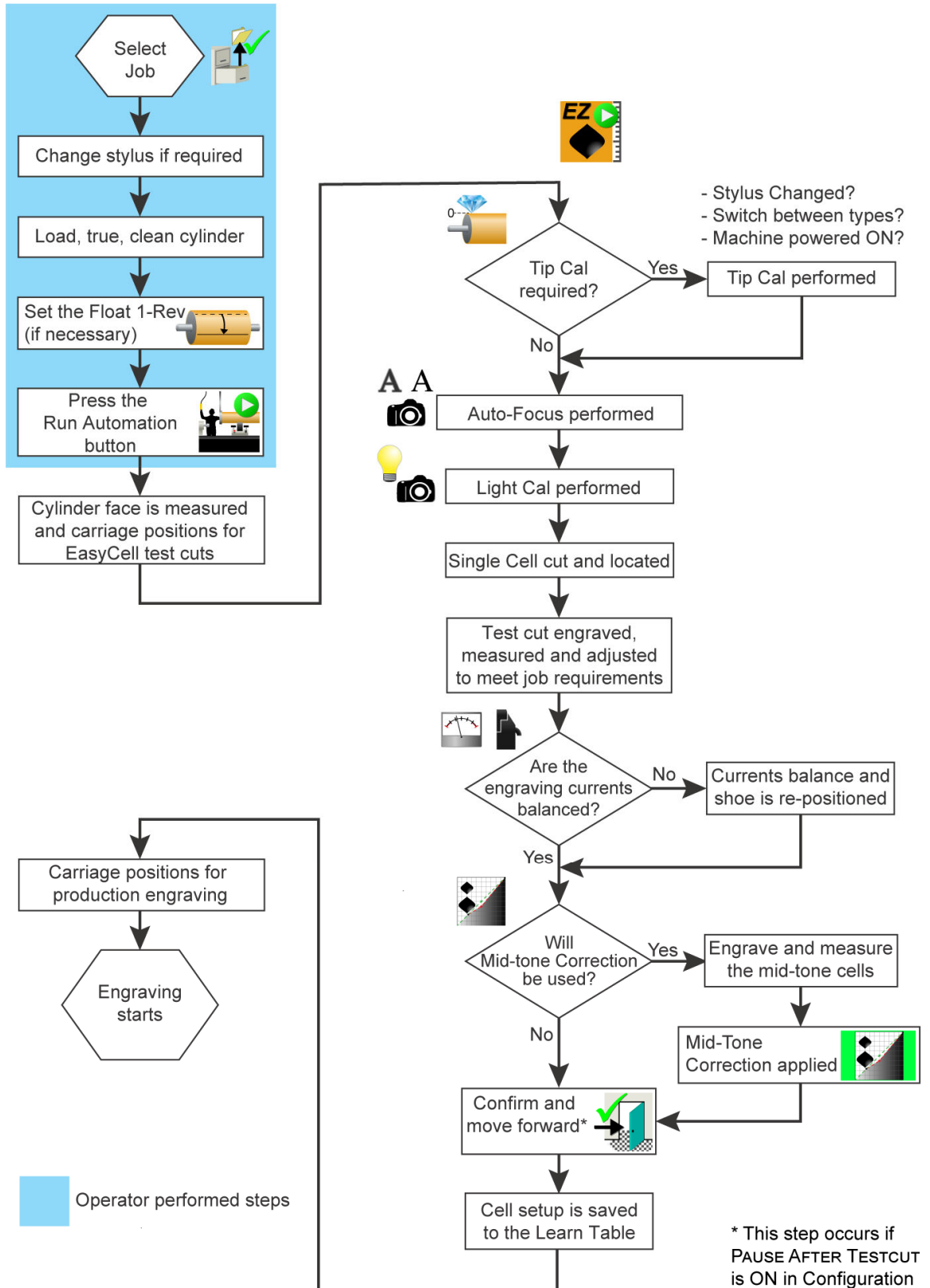
Sequenced Engraving



17. The Spectrum loads the second job in a sequenced group (set in Collage). The carriage moves to the testcut position of the job and starts an EasyCell converge (restarts at step 11 earlier). When testcuts are achieved, the production engraving of the second cylinder begins.

As with the first job in the sequenced group, an end-of-job testcut can be made after engraving finishes.

Flowchart of Engraving using EasyCell Converge and Semi-Automation



Engraving Using EasyCell Converge – Semi-Automation with Cylinder Supports

The EasyCell Converge is a machine controlled testcut process for achieving cell specifications. When completed, the machine begins engraving the production cylinder. A flowchart of this process is shown on page 28.

Semi-Automation performs all setup and engraving functions automatically – the operator only loads the cylinder into the machine. The machine confirms the cylinder face length using end-seeking and positions the carriage for testcuts and production engraving. Positioning parameters are entered in the Collage job.

These instructions also explain what happens with Sequenced Cylinders. Sequenced Groups are created in Collage and combine two or more cylinders into one cylinder. Each cylinder can have different engraving screen/screen angles.

Select the Job for Engraving

Start this process with the machine idle and no cylinder installed.



1. From the Engrave page, select the cylinder for engraving. See *Downloading a Job* on page 15.

Stylus Angle

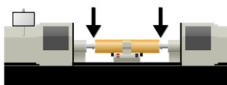
2. Verify the correct stylus angle is installed in the engraver. The machine prompts you to change the stylus if the wrong angle is installed. If necessary, change the stylus.

Start Semi-Automation



3. Return to the Engrave page. Press the Run Semi-Automation button to start the sequence.
4. The carriage homes (if not already at home).
5. The headstock and tailstock move for cylinder loading.
6. The cylinder supports position at the proper height for the circumference of the selected job.

Load Cylinder into Machine



7. The machine then prompts you to load the cylinder. Set the cylinder onto the cylinder supports. At this point the cylinder diameter is verified (optional feature). The machine signals if the cylinder is out of specification.
8. Move the headstock and tailstock into position and secure the cylinder using cones or chucks, depending on your machine configuration.
9. When the cylinder is secured, press OK.



The cylinder supports lower back into the machine bed.

10. End-seeking begins with the carriage moving to the right end of the cylinder. There may be a slight pause as the carriage nears the expected end of the cylinder, this is normal.

Note: The cylinder must be a clean non-engraved cylinder. Using end-seeking on cylinders with engraving may produce false indications of the cylinder end and disrupt the process.

11. When the right end is found, the carriage reverses travel and moves to the left end of the cylinder. Again, a slight pause may occur and this is normal.
12. The cylinder face length is compared against the job parameters. If the length is within tolerance, the machine positions the carriage the the testcut position.

Note: Cylinder Face Length Tolerance is found on the Configuration page:
Automation>Cylinder Face Length Tolerance
This is normally set to 10mm.

13. The EasyCell converge starts automatic setup of cell sizes to the job requirements.

- a) First the EasyCell sequence performs several sub-routines:
 - Tip calibration (situation dependent)
 - Camera focus to ensure good focus on the cylinder surface
 - Light calibration to compensate for surface reflectivity
 - Check and balance the engrave currents
- b) Next, a single cell routine to locate the testcut position.
- c) Testcuts of full and highlight cells are made and measurements are taken of the cell and channel sizes, based on the job information. Additional adjustment cuts are made until the target sizes are achieved.

If difficulties arise with cell measurements, go to step 11. Otherwise go to step 12.

QuickCell Assist with EasyCell Converge

14. Some conditions like soft copper, compressed screens, or small channels make measuring difficult for the VISTA system. If this happens during an EasyCell Converge:



- a) Press the QCell button to interrupt the EasyCell function. The converge routine is now converted to the QuickCell method where the operator verifies the measurements being made. This includes Mid-Tone Correction as well. Be patient after pressing the button, it may take one EasyCell cycle before QuickCell is active.

For additional information on QuickCell, see *Start QuickCell Converge* on page 38.
- b) Verify, and if necessary adjust, all three cell variables.
- c) Press the QCell button to perform another testcut with the needed corrections and verify the resulting cells. Repeat this until the full, highlight and channel are within spec.



- d) When all the sizes are correct, press the Exit button.
- e) Engraving currents are checked. If within the proper range, the cell setup is automatically stored to the Learn Table. Go to step 12f.

If the currents are out of range, the shoe is repositioned and another set of testcuts are made to verify the new shoe position. The process starts again at step 11a.



- f) A Mid-Tone test cut is made and measured (if called for in Collage job or machine configuration). Verify the size. If out of spec, touch the MidTone QCell button to make an adjustment cut. Press the Exit button when correct. Go to step 14.

Carriage Re-positions and Engraving Starts



15. The carriage moves to the start of engraving and the production job begins cutting.

Note: The engraver may not automatically start engraving. If the PAUSE AFTER TESTCUT configuration item is set to YES, the machine waits for the operator to review. To continue, Press the EZCell Complete button.

Engraving Ends

16. When the engraving finishes, the machine can:
 - Stop the cylinder and wait for the operator to unload the cylinder from the machine.
 - Engrave a second 'end-of-job' testcut. This is job dependent and set in Collage.
 - Starts the testcut for the second engraving in a sequenced group. See *Sequenced Engraving* below.

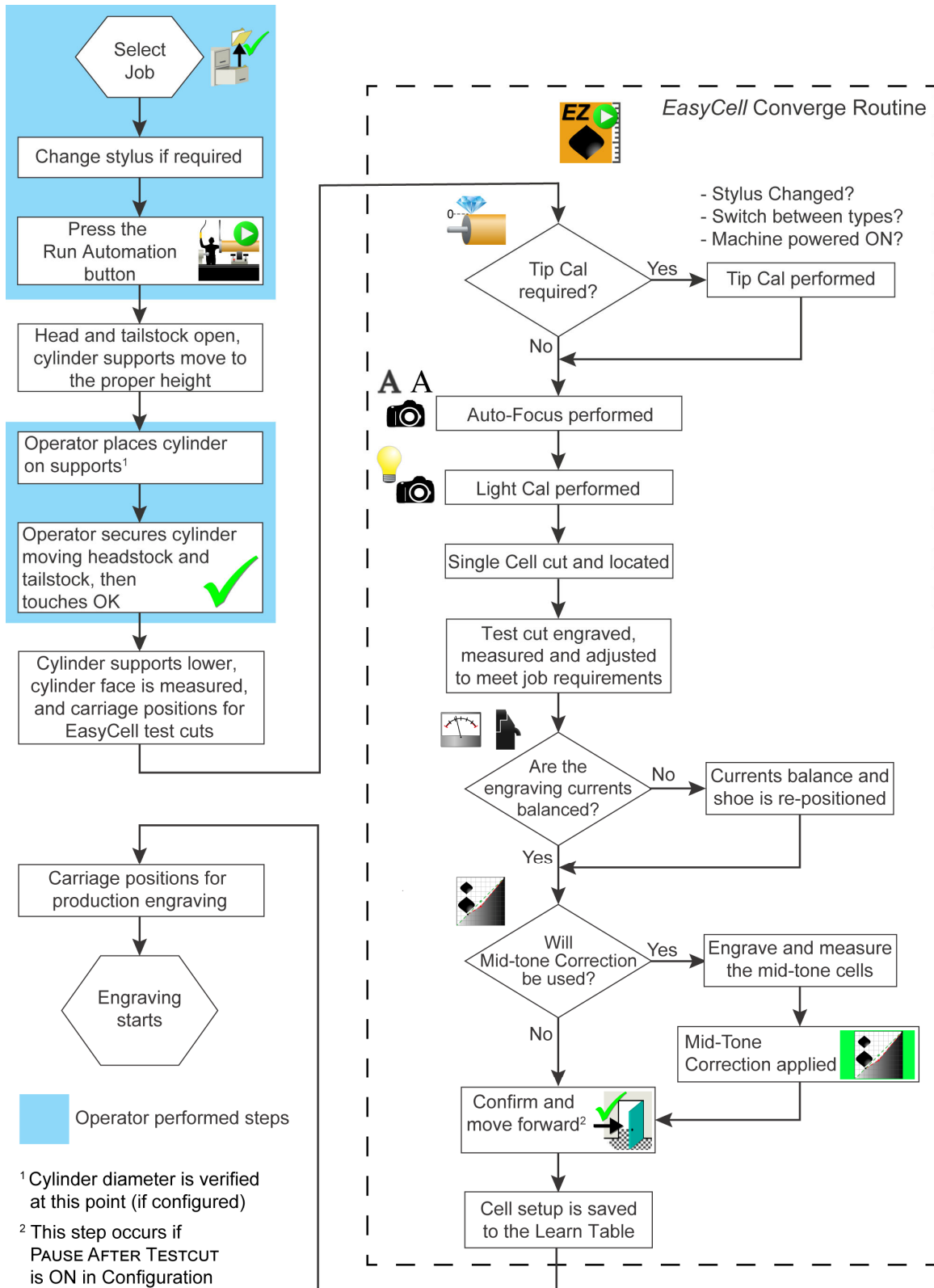
Sequenced Engraving



17. The Spectrum loads the second job in a sequenced group (set in Collage). The carriage moves to the testcut position of the job and starts an EasyCell converge (restarts at step 13 above). When testcuts are achieved, the production engraving of the second cylinder begins.

As with the first job in the sequenced group, an end-of-job testcut can be made after engraving finishes.

Flowchart of Engraving using EasyCell Converge and Semi-Automation with Cylinder Supports



Engraving Using EasyCell Converge – Engrave Automation

The EasyCell Converge is a machine controlled testcut process for achieving cell specifications. When completed, the machine begins engraving the production cylinder. A flowchart of this process is shown on page 32.

Engrave Automation requires the operator to position the carriage at the engraving start position and zero the Carriage location.

If testcut position information is set in the Collage job, the carriage automatically positions for the testcut location.

If testcut position information is not in the Collage job, the operator must move the carriage to the testcut position. Do not reset the Carriage location.

These instructions also explain what happens with Sequenced Cylinders. Sequenced Groups are created in Collage and combine two or more cylinders into one cylinder. Each cylinder can have different engraving screen/screen angles.

Select the Job for Engraving

Start this process with the machine idle and no cylinder installed.



1. From the Engrave page, select the cylinder for engraving. See *Downloading a Job* on page 15.

Stylus Angle

2. Verify the correct stylus angle is installed in the engraver. The machine prompts you to change the stylus if the wrong angle is installed. If necessary, change the stylus.

Load Cylinder into Machine

3. Refer to *Loading a Cylinder* on page 45.

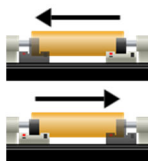
True the Cylinder

4. Verify cylinder run-out and correct if necessary.

Align Circumferential Start with Keyway

5. Set the image drop or float the 1-Rev, if necessary as described in *Floating the 1-Rev* and *Setting the Image Drop* on page 53.

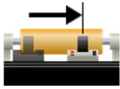
Position Carriage



6. Use the Carriage Left/Right buttons to move the carriage to the start-of-engrave position.

1234.56 mm

7. Zero the carriage position using the Carriage toolbar.



8. Move the carriage to the testcut position. Use the Carriage Left/Right buttons or the 'Go To Position' button on the Carriage toolbar. This can be either a negative or positive position with respect to carriage zero.

Do not zero the carriage position again. Close the Carriage toolbar.

Start EasyCell Converge



9. Return to the Engrave page. Press the EZ button to start the EasyCell converge routine.
10. The EasyCell converge starts automatic setup of cell sizes to the job requirements.
 - a) First the EasyCell sequence performs several sub-routines:
 - Tip calibration (situation dependent)
 - Camera focus to ensure good focus on the cylinder surface
 - Light calibration to compensate for surface reflectivity
 - Check and balance the engrave currents
 - b) Next, a single cell routine to locate the testcut position.
 - c) Testcuts of full and highlight cells are made and measurements are taken of the cell and channel sizes, based on the job information.

If difficulties arise with cell measurements, go to step 11. Otherwise go to step 12.

QuickCell Assist with EasyCell Converge

11. Some conditions like soft copper, compressed screens, or small channels make measuring difficult for the VISTA system. If this happens during an EasyCell Converge:



- a) Press the QCell button to interrupt the EasyCell function. The converge routine is now converted to the QuickCell method where the operator verifies the measurements being made. This includes Mid-Tone Correction as well. Be patient after pressing the button, it may take one EasyCell cycle before QuickCell is active.

For additional information on QuickCell, see *Start QuickCell Converge* on page 38.

- b) Verify, and if necessary adjust, all three cell variables.
- c) Press the QCell button to perform another testcut with the needed corrections and verify the resulting cells. Repeat this until the full, highlight and channel are within spec.



- d) When all the sizes are correct, press the Exit button.

- e) Engraving currents are checked. If within the proper range, the cell setup is automatically stored to the Learn Table. Go to step 11f.

If the currents are out of range, the shoe is repositioned and another set of testcuts are made to verify the new shoe position. The process starts again at step 10a.



- f) A Mid-Tone test cut is made and measured (if called for in Collage job or machine configuration). Verify the size. If out of spec, touch the MidTone QCell button to make an adjustment cut. Press the Exit button when correct. Go to step 14.

EasyCell Converge Finishes



12. Engraving currents are checked when the correct cell sizes are achieved. If within the proper range, the machine goes to step 13.

If the currents are out of range, the shoe is repositioned and testcuts are repeated. After running an auto-focus routine, the process starts again at step 10a.

Mid-tone Correction



13. A mid-tone testcut is automatically made and measured (if called for in Collage job or by machine configuration). The machine measures the mid-tone cells, determines the corrective action required, and turns on the feature.

Carriage Re-positions and Engraving Starts



14. The carriage moves to the start of engraving and the production job begins cutting.

Note: The engraver may not automatically start engraving. If the PAUSE AFTER TESTCUT configuration item is set to YES, the machine waits for the operator to review. To continue, Press the EZCell Complete button.

Engraving Ends

15. When the engraving finishes, the machine can:
 - Stop the cylinder and wait for the operator to unload the cylinder from the machine.
 - Engrave a second 'end-of-job' testcut. This is job dependent and set in Collage.
 - Starts the testcut for the second engraving in a sequenced group. See *Sequenced Engraving* below.

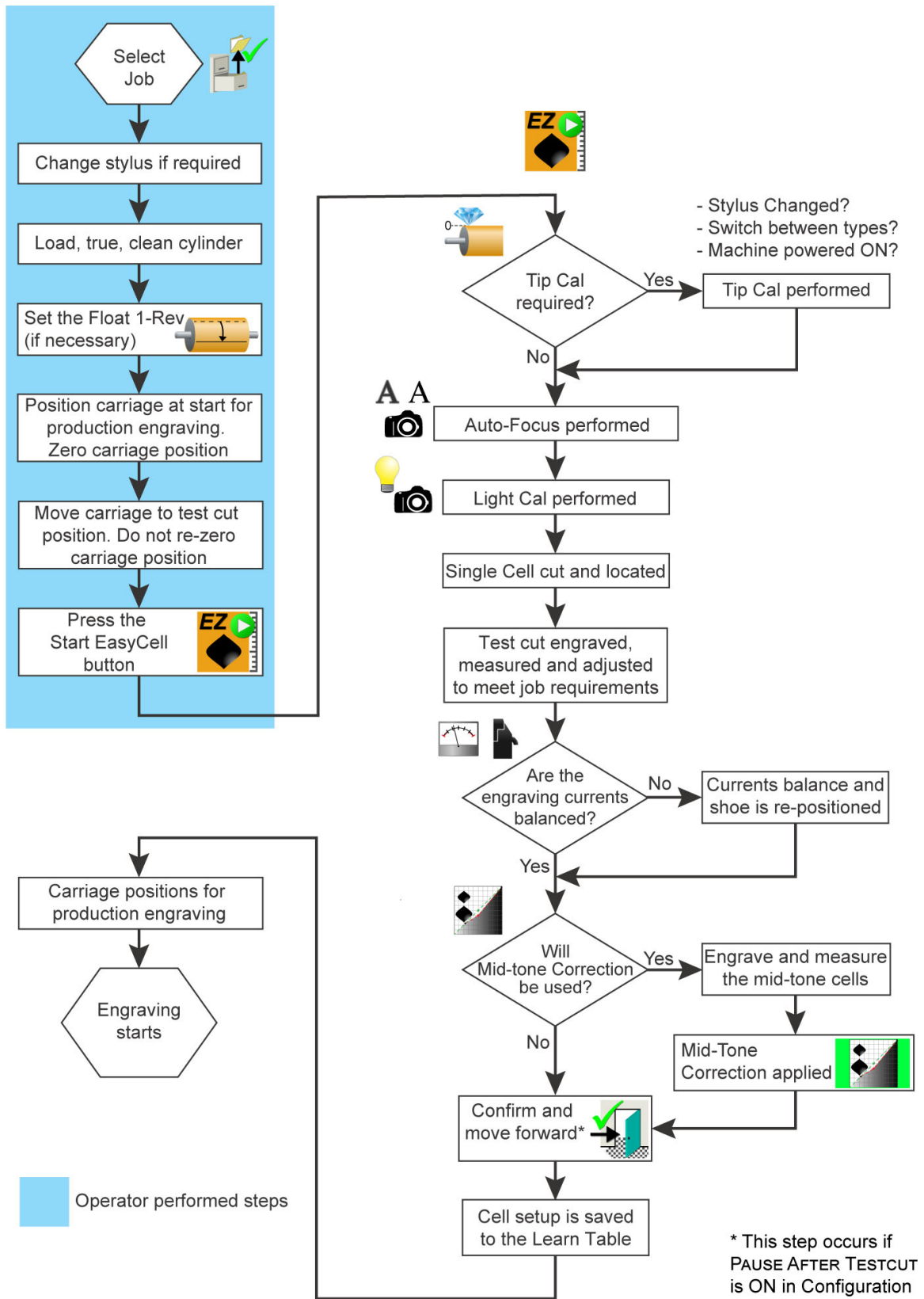
Sequenced Engraving



16. The Spectrum loads the second job in a sequenced group (set in Collage). The carriage moves to the testcut position of the job and starts a QuickCell converge (restarts at step 10 earlier). When testcuts are achieved, the production engraving of the second cylinder begins.

As with the first job in the sequenced group, an end-of-job testcut can be made after engraving finishes.

Flowchart of Engraving using EasyCell Converge and Engrave Automation



Engraving Using QuickCell Converge – Semi-Automation

The QuickCell Converge is an operator-controlled testcut process. When completed, the machine begins engraving the production cylinder. A flowchart of this process is shown on page 36.

Semi-Automation with QuickCell performs all setup and engraving functions automatically except for the testcuts. The machine confirms the cylinder face length using end-seeking and positions the carriage for the testcuts, at which time the operator verifies the cells sizes. When the sizes are achieved, the carriage moves to the start location and production engraving. These positioning parameters are entered in the Collage job.

Start this process with the machine sitting idle with no cylinder installed.

Select the Job for Engraving



1. From the Engrave page, select the cylinder for engraving. See *Downloading a Job* on page 15.

Stylus Angle

2. Verify the correct stylus angle is installed in the engraver. The machine prompts you to change the stylus if the wrong angle is installed. If necessary, change the stylus.

Load Cylinder into Machine

3. Refer to *Loading a Cylinder* on page 45.

True the Cylinder

4. Verify cylinder run-out and correct if necessary.

Align Circumferential Start with Keyway

5. Set the image drop or float the 1-Rev, if necessary as described in *Floating the 1-Rev* and *Setting the Image Drop* on page 53.

Start QuickCell Converge



6. Return to the Engrave page. Press the Run Semi-Automation button to start the sequence.
7. The engraver moves the carriage to the Home position, lowers the head against the cylinder, then raises it to the end-seeking position.
8. End-seeking begins with the carriage moving to the right end of the cylinder. There may be a slight pause as the carriage nears the expected end of the cylinder, this is normal.
Note: The cylinder must be a clean non-engraved cylinder. Using end-seeking on cylinders with engraving may produce false indications of the cylinder end and disrupt the process.
9. When the right end is found, the carriage reverses travel and moves to the left end of the cylinder. Again, a slight pause may occur and this is normal.

10. The cylinder face length is compared against the job parameters. If the length is within tolerance, the machine positions the carriage the the testcut position.

Note: Cylinder Face Length Tolerance is found on the Configuration page:
Automation>Cylinder Face Length Tolerance
This is normally set to 10mm.

11. The EasyCell converge starts automatic setup of cell sizes to the job requirements.
 - a) First the EasyCell sequence performs several sub-routines:
 - Tip calibration (situation dependent)
 - Camera focus to ensure good focus on the cylinder surface
 - Light calibration to compensate for surface reflectivity
 - Check and balance the engrave currents
 - b) Next, a single cell routine to locate the testcut position.
 - c) Testcuts of full and highlight cells are made and measurements are taken of the cell and channel sizes. At this point the machine pauses to allow the operator to review the measured cells and make corrections if necessary.



- d) The operator verifies the measurements. If the measurements are not within specifications, an adjustment cut is started by pressing the Q button. Go to step 11e.
- If the sizes are correct, go to step 12.
- e) Another testcut is made and measured, and the operator again reviews the cell/channel sizes – steps 11c and 11d. This routine continues until the proper cell sizes are achieved, usually in 2-3 testcuts.

QuickCell Converge Finishes



12. When all sizes are correct, press the Exit button.
Engraving currents are checked. If within the proper range, the cell setup is automatically stored to the Learn Table. Go to step 13.
If the currents are out of range, the shoe is repositioned and another set of testcuts are made to verify the new shoe position. After running an auto-focus routine, the sequence returns to step 11c.

Mid-tone Correction



13. (Optional step) A Mid-Tone test cut is made and measured (if called for in Collage job or machine configuration). Verify the size. If out of spec, touch the MidTone QCell button to make an adjustment cut.



Press the Exit button when correct.

Carriage Re-positions and Engraving Starts



14. The carriage moves to the start of engraving and the production job begins cutting.

Engraving Ends

15. When the engraving finishes, the machine can:

- Stop the cylinder and wait for the operator to unload the cylinder from the machine.
- Engrave a second 'end-of-job' testcut. This is job dependent and set in Collage.
- Starts the testcut for the second engraving in a sequenced group. See *Sequenced Engraving* below.

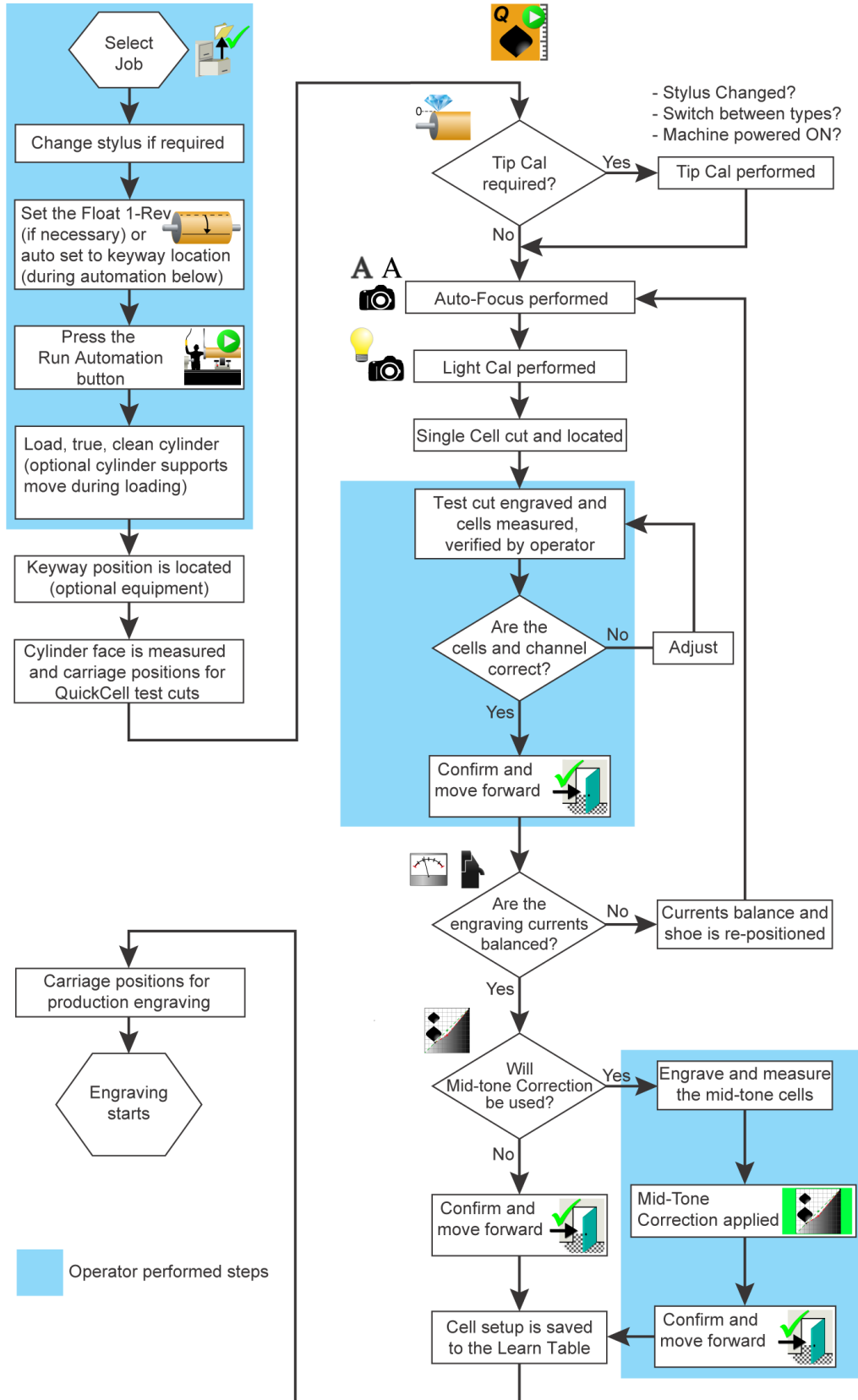
Sequenced Engraving



16. The Spectrum loads the second job in a sequenced group (set in Collage). The carriage moves to the testcut position of the job and starts a QuickCell converge (restarts at step 11 earlier). When testcuts are achieved, the production engraving of the second cylinder begins.

As with the first job in the sequenced group, an end-of-job testcut can be made after engraving finishes.

Flowchart of Engraving using QuickCell Converge and Semi-Automation



Engraving Using QuickCell Converge – Engrave Automation

The QuickCell Converge is an operator-controlled testcut process. When completed, the machine begins engraving the production cylinder. A flowchart of this process is shown on page 40.

Engrave Automation requires the operator to position the carriage at the engraving start position and zero the Carriage location.

If testcut position information is set in the Collage job, the carriage automatically positions for the testcut location. This information is required for sequenced cylinder engraving.

If testcut position information is not in the Collage job, the operator must move the carriage to the testcut position. Do not reset the Carriage location.

These instructions also explain what happens with Sequenced Cylinders. Sequenced Groups are created in Collage and combine two or more cylinders into one cylinder. Each cylinder can have different engraving screen/screen angles.

Select the Job for Engraving



Start this process with the machine sitting idle with no cylinder installed.

1. From the Engrave page, select the cylinder for engraving. See *Downloading a Job* on page 15.

Stylus Angle

2. Verify the correct stylus angle is installed in the engraver. The machine prompts you to change the stylus if the wrong angle is installed. If necessary, change the stylus.

Load Cylinder into Machine

3. Refer to *Loading a Cylinder* on page 45.

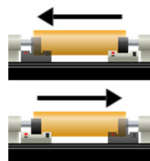
True the Cylinder

4. Verify cylinder run-out and correct if necessary.

Aligning Start with Keyway

5. Set the image drop or float the 1-Rev, if necessary as described in *Floating the 1-Rev* and *Setting the Image Drop* on page 53.

Set Engraving Start Position

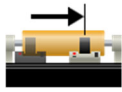


6. Use the Carriage Left/Right buttons to move the carriage to the start-of-engrave position.

1234.56 mm

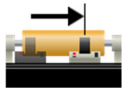
7. Zero the carriage position using the Carriage toolbar.
-

Test Cut Positioning – Defined in Collage



- 8A. The carriage automatically positions for testcuts when the QuickCell Converge is started. No further positioning is required.

Test Cut Positioning – Set by Operator



- 8B. Move the carriage to the testcut position. Use the Carriage Left/Right buttons or the 'Go To Position' button on the Carriage toolbar. This can be either a negative or positive position with respect to carriage zero.

Do not zero the carriage position again.

Start QuickCell Converge



9. Return to the Engrave page. Press the Q button to start the QuickCell converge routine.
10. The machine begins the QuickCell Converge process to manually setup the cell sizes to the job requirements.

- a) First the QuickCell Converge sequence performs several sub-routines:
 - a tip calibration (situation dependent)
 - a camera focus to ensure good focus on the cylinder size
 - a light calibration to compensate for surface reflectivity
 - a check of the engrave current balance
- b) Next, a single cell routine to locate the testcut position.
- c) Testcuts of Full and highlight cells are made and initial measurements taken of the cell and channel sizes. At this point the machine pauses to allow the operator to review the measured cells and make corrections if necessary.



- d) If the measurements are not within job specifications, the operator makes the necessary corrections and pushes the Q button again to make the adjustment. Go to step 10e.

If the sizes are correct, go to step 11.

- e) Another testcut is made and measured, and the operator again reviews the cell/channel sizes – step 10c and 10d. This routine continues until the proper cell sizes are achieved, usually in 2-3 testcuts.

QuickCell Converge Finishes



11. When all sizes are correct, press the Exit button.

Engraving currents are checked. If within the proper range, the cell setup is automatically stored to the Learn Table. Go to step 12.

If the currents are out of range, the shoe is repositioned and another set of testcuts are made to verify the new shoe position. After running an auto-focus routine, the press starts again at step 10c.

Mid-tone Correction



12. A Mid-Tone test cut is made and measured (if called for in Collage job or machine configuration). The operator verifies the size. If out of spec, touch the MidTone QCell button to make an adjustment cut.



Press the Exit button when correct.

Carriage Re-positions and Engraving Starts



13. The carriage moves to the start of engraving and the production job begins cutting.

Engraving Ends

14. When the engraving finishes, the machine can:
 - Stop the cylinder and wait for the operator to unload the cylinder from the machine.
 - Engrave a second 'end-of-job' testcut. This is job dependent and set in Collage.
 - Start the testcut for the second engraving in a sequenced group. See *Sequenced Engraving* below.

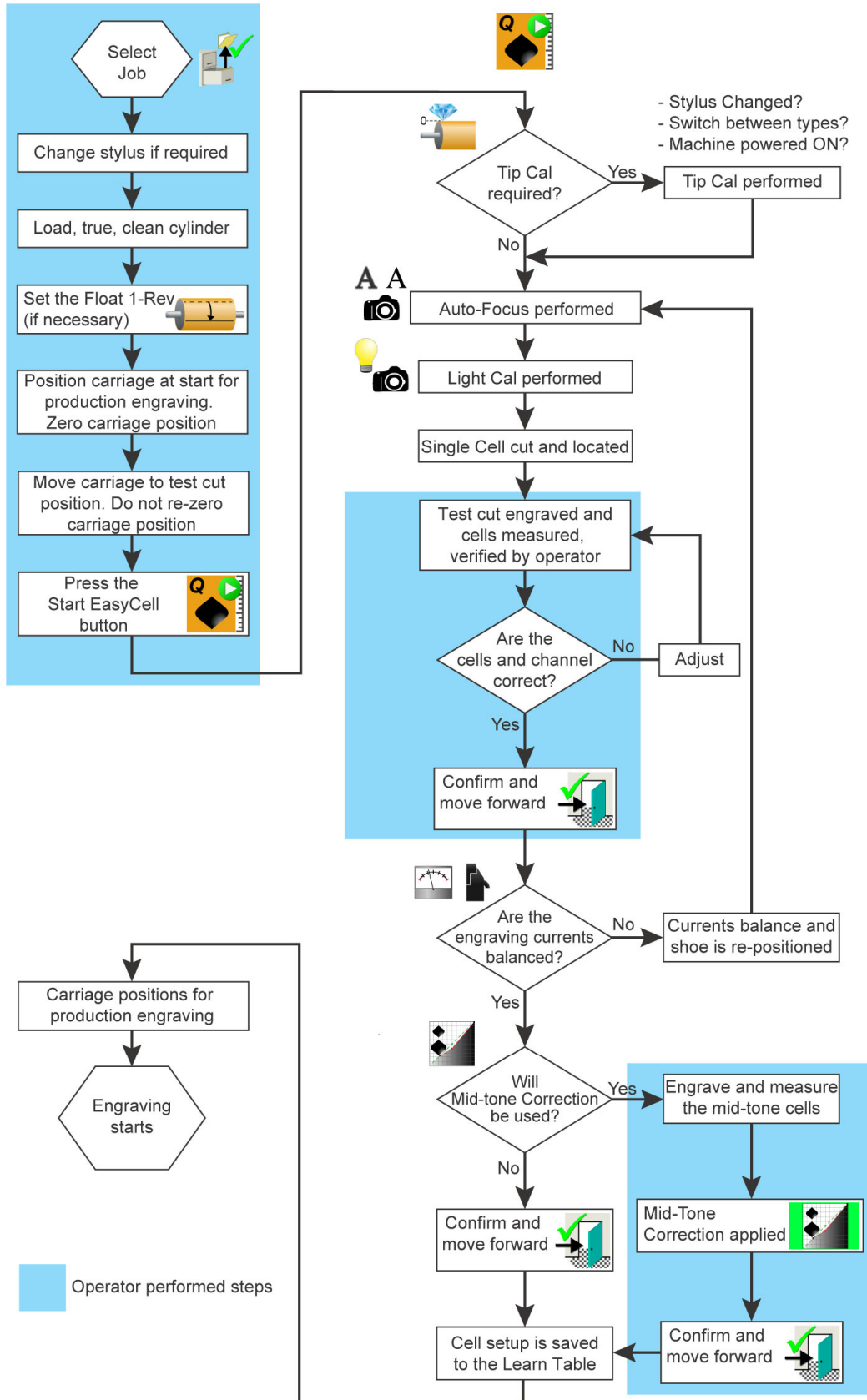
Sequenced Engraving



15. The Spectrum loads the second job in a sequenced group (set in Collage). The carriage moves to the testcut position of the job and starts a QuickCell converge (restarts at step 10 earlier). When testcuts are achieved, the production engraving of the second cylinder begins.

As with the first job in the sequenced group, an end-of-job testcut can be made after engraving finishes.

Flowchart of Engraving using QuickCell Converge and Engrave Automation



Engraving a Job – Manual Procedure

Although the EasyCell or QuickCell procedures work for nearly all of your engraving needs, there may be times when you want to perform some or all steps manually. This is especially true for unique engraving requirements where extremely large cells are being engraved or very poor copper quality exists. This section takes you through the steps necessary for manual engraving.

A flowchart of this process is shown on page 44.

Select the Job for Engraving



1. From the Engrave page, select the cylinder for engraving. See *Downloading a Job* on page 15.

Stylus Angle

2. Verify the correct stylus angle is installed in the engraver. The machine prompts you to change the stylus if the wrong angle is installed. If necessary, change the stylus.

Load Cylinder into Machine

3. Refer to *Loading a Cylinder* on page 45.

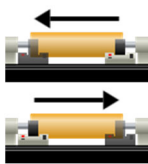
True the Cylinder

4. Verify cylinder run-out and correct if necessary.

Align Circumferential Start with Keyway

5. Set the image drop or float the 1-Rev, if necessary as described in *Floating the 1-Rev* and *Setting the Image Drop* on page 53.

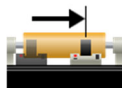
Position Carriage



6. Use the Carriage Left/Right buttons to move the carriage to the start-of-engrave position.



7. Zero the carriage position using the Carriage toolbar.



8. Move the carriage to the testcut position. Use the Carriage Left/Right buttons or the 'Go To Position' button on the Carriage toolbar. This can be either a negative or positive position with respect to carriage zero.

Do not zero the carriage position again. Close the Carriage toolbar.

Engrave Currents



9. Open the Measure Currents Page, then press the Read Currents button. The engraver measures the engrave head currents and displays the results on the touchscreen.

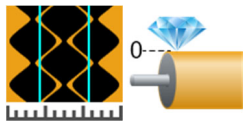
Note: The AC/Vacuum button must be on to measure currents.

Look at the results shown in the current difference box. Currents should be +/- 0.50 Amps or less to be considered balanced at this point. If the currents are balanced, go to step 10.



If the currents are out of balance, correct this by touching the Balance Currents button, then continue to step 10.

Tip Calibration

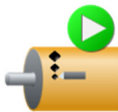


10. Open the Cell Setup page then press the Tip Cal button.


A Tip Calibration is only necessary if:

- The stylus was changed.
- The job type changes, from Hybrid to standard or standard to Hybrid.
- The machine was just powered ON.

Testcuts & Cell Measurement



11. Press the Perform Testcuts button. The machine prompts to 'Start Cylinder Rotation'.

Tap  to start rotation or  to cancel.

The machine lowers the head, makes a testcut, retracts the head and positions the testcut in front of the camera.



12. Open the VISTA page to measure the cells.

a) Touch the Start/Stop Live Video button.

b) Measure the shadow cell first by positioning the camera over the cell/channel. Touch the appropriate measure button on the left of the VISTA page then touch the matching cell or channel within the image. The image freezes when the display is touched and the Live Video button turns RED.



IMPORTANT: Always measure the shadow/full cell first. Measuring the highlight or channel first will cause measuring difficulties.



c) Adjust the cursors if necessary using the cursor controls.

d) Press the Start/Stop Live Video button to start live video. The button turns GREEN.

e) Re-position the camera to measure the channel or highlight cell. Repeat steps 12a through 12e until the shadow, channel and highlight are measured.



f) If the cells are within specification, exit the VISTA measurement page by pressing the Exit button and clicking Cancel. Go to step 13.

If the cells are out of range, click the Testcut button on the VISTA page to perform another manual testcut and return to step 12a.



Note: This is an operational change from earlier software. You no longer must exit the VISTA Page and return to the Cell Setup page for the next testcut.

Engrave Currents



13. Open the Measure Currents Page, then press the Read Currents button. The engraver measures the engrave head currents and displays the results on the touchscreen.



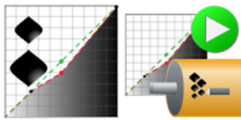
Look at the results shown in the current difference box. Currents should be +/- 2.00 Amps or less to be considered balanced at this point.

If the currents are balanced, go to step 14.



If the currents are out of balance, balance them by touching the Balance Currents button then return to step 11 to make more test cuts.

Mid-tone Correction



14. Enable Mid-tone Correction if required. Mid-tone correction is most often used with process (tone) engraving.

Open the MidTone Correction page and make a test cut.



15. Measure the midtone cells on the cylinder using the VISTA system camera. Perform a second testcut if the cell(s) are not within specification.

Re-position the Carriage for Engraving

1234.56 mm

16. Return the carriage to zero using the Carriage Position buttons or the GoTo function on the Carriage toolbar. Set the travel limit if required.

Note: If Zero Adjust Engraving is turned ON, the machine prompts you to move the carriage to zero when you start engraving (step 18). Zero Adjust Engraving is found on the Configuration page:

General>Zero Adjust Engraving

Start Engraving



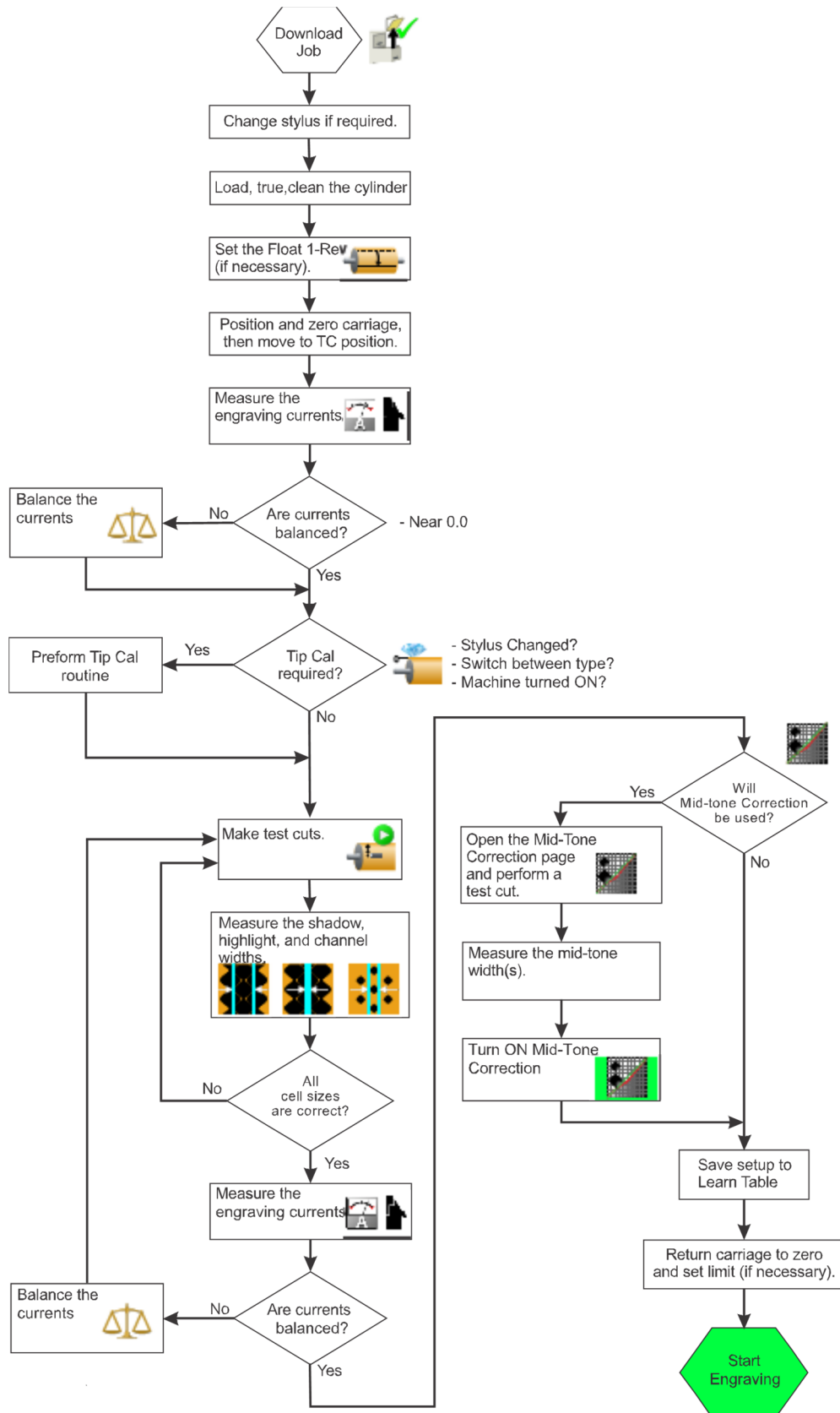
17. Go to the Engrave page.



18. Touch the Engrave Start button to begin engraving the cylinder. The machine prompts to start cylinder rotation and engraving starts. When the end is reached, the head retracts, the AC and vacuum turn OFF, and the cylinder rotation stops.

Note: If Zero Adjust Engraving is turned ON, the machine prompts you to move the carriage to zero when you start engraving.

Flowchart of Engraving using Manual Process



Loading a Cylinder

The cylinder loading procedure differs slightly depending on cylinder fixtures. The instructions include using the operator display or the rear panel buttons on the carriage. Experience shows that loading and unloading is easier using the rear panel buttons.

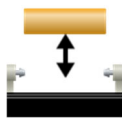
Loading – Using Operator Display



1. Select the required cylinder using the Engrave Page.



2. Fully retract the engrave head if it is not. This provides loading clearance for the cylinder.



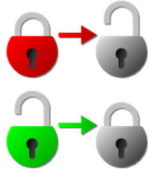
3. Open the Cylinder Handling page.



4. Park the carriage in the center if it is not using the Home button.



5. *Variation* – Raise the cylinder supports if your machine has this option. The supports position at the proper height for the cylinder size of the selected job.



6. Unlock the stocks.

The RED icon shows the stocks are *locked*. Pressing the button unlocks the stocks to allow movement.

The GREEN icon shows the stocks are *unlocked*. This is the icon needed to move the stocks. Pressing the button locks the stocks and disables movement.

Note: The stocks automatically lock after one minute of inactivity. At this point it is necessary to unlock the stocks again to move them.



7. Press and hold the Open Stock button to move the stocks out until the cylinder fits between the stocks.

The next step depends on your cylinder type.

See *Loading with Cones* if you are using tube/shaftless cylinders. See page 46.

See *Loading with Manual Chucks* if you are using integral shaft cylinders. See page 46.

See *Loading with Auto-Chucks* if you are using integral shaft cylinders and your machine has optional auto-chucks installed. See page 47.

Loading with Cones

8. Lower the cylinder down between the cones until the centerline of the cylinder is slightly below the stocks centerline.

Variation – If your machine has cylinder supports, set the cylinder on the supports and remove the hoist.



9. Press and hold the Close Stocks button to capture the cylinder. Hold the button for at least one second after the stocks stop moving to ensure there is enough pressure to hold the cylinder.

10. Check the cylinder runout. Runout should be 0.050 mm (0.002 inches) or less. If the runout is larger, it may be necessary to regrip the cylinder at a different circumferential position to improve runout. If this does not help, shims can be added between the cylinder and cones as necessary to achieve this tolerance.

WARNING: Securely support the cylinder before releasing and regripping the cylinder.



11. *Variation* – Lower the cylinder supports.

12. Clean and lubricate the cylinder. See *Cleaning the Cylinder* on page 52.

Loading with Manual Chucks

8. Lower the cylinder until the shafts are aligned with the centerline of the chucks.

Variation – If your machine has cylinder supports, set the cylinder on the supports and remove the hoist.

9. Open the jaws using the chuck key to allow clearance of the shaft diameter into the chuck jaws.



10. Close the stocks to position the chuck jaws over the shafts.

11. Tighten the chuck jaws.

CAUTION: Do not overtighten the chucks to prevent breakage.

– 200 mm (8 inch) chucks – No more than 140 Nm.

– 315 mm (12 inch) chucks – No more than 180 Nm.



12. *Variation* – Lower the cylinder supports if necessary.

13. Indicate the cylinder to within 0.050 mm (0.002 inches) or less. See *Truing the Cylinder* on page 52.

14. Clean and lubricate the cylinder. See *Cleaning the Cylinder* on page 52.

Loading with Auto-Chucks

Auto-Chucks are optional equipment. The Auto-Chucks open to meet the shaft size of the cylinder selected for engraving in step 1. The shaft size is defined in the Collage job as part of the Cylinder Geometry.

- Lower the cylinder until the shafts are aligned with the centerline of the chucks.

Variation – If your machine has cylinder supports, set the cylinder on the supports and remove the hoist.



- Close the stocks to position the chuck jaws over the shafts.



- On the Touchscreen, press the Close Chucks button to tighten the chuck jaws on the shafts.



- Variation* – Lower the cylinder supports if necessary.

- Clean and lubricate the cylinder. See *Cleaning the Cylinder* on page 52.

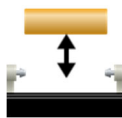
Loading – Using Rear Panel Controls



- Select the required cylinder using the Engrave Page.



- Fully retract the engrave head if it is not. This provides clearance for the cylinder during loading.



- Open the Cylinder Handling page.



- Park the carriage in the center if it is not using the Home button.



- Variation* – Raise the cylinder supports if your machine has this option. The supports position at the proper height for the cylinder size of the selected job.

Go to the rear of the machine to continue loading.



- Press and hold the Unlock and Open Stock buttons simultaneously to move the stocks out until the cylinder will fit between the stocks.

The next step depends on your cylinder type.

See *Loading with Cones* if you are using tube/shaftless cylinders. See page 47.

See *Loading with Manual Chucks* if you are using integral shaft cylinders. See page 48.

Loading from the rear is not recommended with machines equipped with Auto-Chucks.

Loading with Cones

7. Lower the cylinder down between the cones until the centerline of the cylinder is slightly below the stocks centerline.

Variation – If your machine has cylinder supports, set the cylinder on the supports and remove the hoist.



8. Press and hold the Unlock and Close Stock buttons simultaneously to capture the cylinder. Hold the buttons for at least one second after the stocks stop moving to ensure there is enough pressure to hold the cylinder.



9. *Variation* – Lower the cylinder supports if necessary.

10. Check the cylinder runout. Runout should be 0.050 mm (0.002 inches) or less. If the runout is larger, it may be necessary to regrip the cylinder at a different circumferential position to improve runout. If this does not help, shims can be added between the cylinder and cones as necessary to achieve this tolerance.

WARNING: Securely support the cylinder before releasing and regripping the cylinder.

11. Clean and lubricate the cylinder. See *Cleaning the Cylinder* on page 52.

Loading with Manual Chucks

7. Lower the cylinder until the shafts are aligned with the centerline of the chucks.

Variation – If your machine has cylinder supports, set the cylinder on the supports and remove the hoist.

8. Open the jaws using the chuck key to allow clearance of the shaft diameter into the chuck jaws.

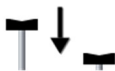


9. Press and hold the Unlock and Close Stock buttons simultaneously to position the chuck jaws over the shafts.

10. Tighten the chuck jaws.

CAUTION: Do not overtighten the chucks.

- 8 inch chucks – No more than 140 Nm.
- 12 inch chucks – No more than 180 Nm.



11. *Variation* – Lower the cylinder supports if necessary.

12. Indicate the cylinder to within 0.050 mm (0.002 inches) or less. See *Truing the Cylinder* on page 52.

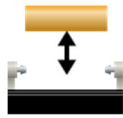
13. Clean and lubricate the cylinder. See *Cleaning the Cylinder* on page 52.

Unloading the Cylinder

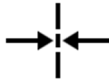
After the cylinder finishes engraving, the engrave head retracts fully and the cylinder stops rotation. Use one of the following methods described to unload the cylinder.

Unloading – Using Operator Display

To unload a cylinder from the machine:



1. Open the Cylinder Handling page.



2. Park the carriage in the center using the Home button.

The next step depends on your cylinder type.

See *Unloading with Cones* if you are using tube/shaftless cylinders. See page 49.

See *Unloading with Manual Chucks* if you are using integral shaft cylinders. See page 50.

See *Unloading with Auto-Chucks* if you are using integral shaft cylinders and your machine has optional auto-chucks installed. See page 50.

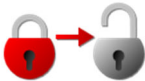
Unloading with Cones

3. Wrap the cylinder with protective material.



4. *Variation* – Raise the cylinder supports if your machine has this option. The supports position at the proper height for the cylinder size found in the loaded job.

If no supports are installed, secure the cylinder using an overhead hoist.



5. Unlock the stocks.

The RED icon shows the stocks are *locked*. Press this button to unlock the stock and allow movement.



The GREEN icon shows the stocks are *unlocked*. Press this button to lock the stock and disable movement. This is the icon you need to see when moving the stocks.

Note: The stocks automatically lock after one minute of inactivity. Unlock the stocks again to move them.



6. Press and hold the Open Stock button to move the stocks out until the cylinder is clear of the cones.

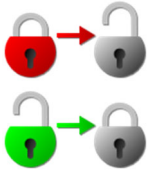
7. Lift the cylinder clear of the machine.

Unloading with Manual Chucks



3. *Variation* – Raise the cylinder supports if your machine has this option. The supports position at the proper height for the cylinder size found in the loaded job.

If no supports are installed, secure the cylinder using an overhead hoist.



4. Unlock the stocks.

The RED icon shows the stocks are *locked*. Press this button to unlock the stock and allow movement.

The GREEN icon shows the stocks are *unlocked*. Press this button to lock the stock and disable movement. This is the icon you need to see when moving the stocks.

Note: The stocks automatically lock after one minute of inactivity. Unlock the stocks again to move them.



5. Press and hold the Open Stock button to move the stocks out until the cylinder is clear of the cones.

6. Lift the cylinder clear of the machine.

Unloading with Auto-Chucks



3. On the touchscreen display, open the Cylinder Handling page. Locate the Auto-Chucks by pressing this button.

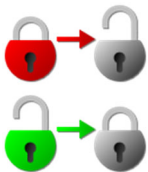


4. *Variation* – Raise the cylinder supports if your machine has this option. The supports position at the proper height for the cylinder size found in the loaded job.

If no supports are installed, secure the cylinder using an overhead hoist.



5. Press the Open Auto-Chucks to release the cylinder shafts.



6. Unlock the stocks.

The RED icon shows the stocks are *locked*. Press this button to unlock the stock and allow movement.

The GREEN icon shows the stocks are *unlocked*. Press this button to lock the stock and disable movement. This is the icon you need to see when moving the stocks.

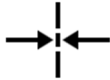
Note: The stock will automatically lock after one minute of inactivity. At this point it is necessary to unlock the stocks again to move them.

7. Press and hold the Open Stock button to move the stocks out until the cylinder is clear of the cones.



8. Lift the cylinder clear of the machine.

Unloading – Using Rear Controls



1. On the Cylinder Handling page, park the carriage in the center using the Home button.

The next step depends on your cylinder type.

See *Unloading with Cones* if you are using tube/shaftless cylinders. See page 51.

See *Unloading with Manual Chucks* if you are using integral shaft cylinders. See page 51.

Unloading using the rear controls with auto-chuck equipped machines is not recommended.

Unloading with Cones

2. Wrap the cylinder with protective material.



3. *Variation* – On the Cylinder Handling page, raise the cylinder supports if your machine has this option. The supports position at the proper height for the cylinder size found in the loaded job.

If no supports are installed, secure the cylinder using an overhead hoist.



4. Press and hold the Unlock and Open Stock buttons simultaneously to move the stocks out until the cylinder is clear of the cones.

5. Lift the cylinder clear of the machine.

Unloading with Manual Chucks



2. *Variation* – On the Cylinder Handling page, raise the cylinder supports if your machine has this option. The supports position at the proper height for the cylinder size found in the loaded job.

If no supports are installed, secure the cylinder using an overhead hoist.



3. Press and hold the Unlock and Open Stock buttons simultaneously to move the stocks out until the cylinder is clear of the cones.

4. Lift the cylinder clear of the machine.

Truing the Cylinder

Cylinder run-out can create imbalance in engraved results. It is always wise to verify run-out and, if possible, correct it to achieve the best results. Cylinders mounted using cones are difficult to true. Cylinders held in 3-jaw chucks, including shaftless cylinders with cones held in the chucks, can be trued.

Cylinder run-out should be 0.050 mm (0.002 inches) or less.

For 3- or 4-jaw chucks:

- True the cylinder using the adjustments on the individual jaws.
- Be careful when adjusting the jaws - do not exert too much pressure on one jaw.
- Do not use only one jaw to adjust run-out, balance adjustments between two or more jaws to prevent stressing the chuck. This includes slightly loosening one jaw before tightening another.
- Use the pinion on the outer diameter to tighten all jaws at once.

CAUTION: YOU CAN break a chuck!

- Use only the keys supplied with the machine.
- Do not add extensions to the keys to increase force.
- Do not apply more than:
 - 140 Nm at the pinion when tightening 8 inch chucks
 - 180 Nm at the pinion when tightening 12 inch chucks

For cones mounted in chucks, true the cylinder using the adjustments on the chuck jaws.

For direct cones, it may be necessary to regrip the cylinder at a different circumferential position to improve runout. If this does not help, shims can be added between the cylinder and cones as necessary to achieve this tolerance. Use caution to ensure the cylinder does not slip if adding shims.

WARNING: Securely support the cylinder before releasing and regripping the cylinder.

Note: You cannot true a cylinder using Auto-Chucks.



To turn the cylinder slowly for verifying cylinder run-out, press and hold the Clean button. The cylinder turns at a slow rate until the button is released.

Cleaning the Cylinder

A clean, lubricated cylinder is important to engrave quality. The following steps are the minimum required for cylinder preparation. Your company may use additional steps.



1. Start cylinder rotation by:
 - Touching the Start Rotation button on the touchscreen display.
 - Pressing the Clean button on the rear control panel.



2. Apply a degreasing agent to the cylinder with a clean, lint-free towel (cloth or paper). Wipe the cylinder dry.
3. Apply a cylinder lubricant (such as Micropel®) with another clean towel. Buff the cylinder surface until dry.
4. Stop the cylinder rotation.

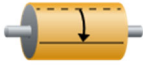
Floating the 1 Rev

The 1 Rev is the circumferential start for engraving. When you 'float the 1 Rev', you change the location of the engrave start. Use this function to shift the start point to a different position, such as a shaft keyway.

Float the 1-Rev after the job is downloaded, and before you begin engraving either testcuts or a job.

To change the location of the natural 1 Rev:

1. Rotate the cylinder to position the desired start-of-engrave directly in front of the engraving stylus.



2. Touch the Float 1-Rev button. A distance appears in the Image Drop function. This is normal operation and the image drop distance should not be reset to zero.

Note: The Float 1 Rev and Image Drop functions are one and the same. Float 1-Rev is an image drop providing a rapid method to set the starting point. Image Drop is a precise function allowing you to set a specific distance in millimetres. Image Drop shows a drop distance when the Float 1 Rev is selected.

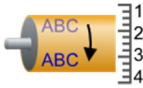
Using Image Drop


There are two methods for using Image Drop. Both types allow you to change the location of the start of engrave from the 1 Rev (engrave start point). Be sure to use the correct type for you situation

Image Drop for the Production Cylinder

This function can be used to set the engrave start to the keyway location on the cylinder. All engraving is shifted when this type is used.

To change the engrave start location:



1. On the Screen page, touch the Image Drop text box.
2. Enter the desired distance in millimeters on the data input pad and touch . The distance displays in the text box next to the icon.


Note: The distance value can be changed to Quartercells if desired for those with experience running older Ohio equipment.

Image Drop for Testcuts only

This function only affects the testcut and does not change the production engraving. When testcuts are finished, this Image Drop value returns to zero.

To change the testcut location:



1. On the Cell Setup page, touch the Image Drop text box.
2. Enter the desired distance in millimeters on the data input pad and touch . The distance displays in the text box next to the icon.

Note: The distance value can be changed to Quartercells if desired for those with experience running older Ohio equipment.

Constant Tone Engraving - Manual Method

You can engrave a constant tone from the Spectrum without downloading a job.

To do this:



1. On the Screen Page:



- a) Enter the engraving screen for the constant tone job.



- b) Enter the screen angle for the job.

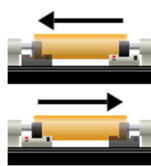


- c) Enter the cylinder circumference or diameter.

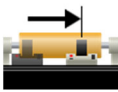


- d) Enter the stylus angle and change the stylus if necessary to match.

2. Load and clean the cylinder.



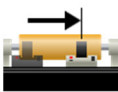
3. Move the carriage to the engraving start point and set the carriage position to zero using the Carriage toolbar.



4. Set the carriage limit for the stopping point of the engraving. Verify that the distance prevents the engraving from going past the cylinder end.

CAUTION: When no engrave limit is set, the head could run off the cylinder, causing serious damage to the diamond tools on the engrave head.

Note: Remember to remove the Engrave Limit after engraving is finished.

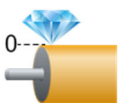


5. Determine the best location on the cylinder for a test block. Use the Carriage Left and Right buttons or the Go To function of the Carriage toolbar to move the engrave carriage to this location.





6. Open the Cell Setup page.

- a) Verify the values in the Target cell sizes.



- b) Perform a Tip Calibration if the stylus was changed in step 1d.



- c) Press the Perform Testcuts button. Touch  to begin rotation or  to cancel.

- d) The machine lowers the head, makes a testcut, retracts the head and stops the cylinder rotation. The testcut is positioned in front of the Vista camera.



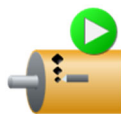
7. Measure the cells on the cylinder using the VISTA system camera. To measure, open the VISTA page button.



- a) Touch the Start/Stop Live Video button.
- b) Measure the three cells: full, channel, and highlight. Position the camera over the full or highlight cells. Press the appropriate measure button at the top of the VISTA page.
- c) Touch the cell or channel on the display to measure. Adjust the cursors if necessary using the cursor controls. The image is frozen when the display is touched to prevent accidental cylinder movement during measuring.



- d) Press the Start/Stop Live Video button to re-start live video.
- e) Re-position the camera if necessary to measure the next cell. Repeat steps 7b through 7d until all cells are measured.



- f) If any of the cell specifications do not match the target, press the Perform Testcut button and allow the system to make the appropriate corrections. Return to step 7 and repeat the measurement procedure. The machine makes the necessary correction when the next testcut is started.

If the Measured Values for all three cell types are within the acceptable tolerance for this job, proceed to step 8.

8. Exit the VISTA measurement page by pressing the Exit button. Answer NO to discard the values or CANCEL to remain on the measure page.

1234.56 mm

9. Re-position the engraving head at Zero (defined in step 3).



10. Open the Utilities page followed by the Tune page.



11. Verify Constant Tone is selected from the list on the left side of the page and the Tone value is at 100% (full cell).



12. Touch the Start Engrave button to begin engraving.

Note: If the cylinder is not rotating, touch  to begin rotation or  to cancel.



The engraver lowers the head against the cylinder and begins engraving a constant tone. Engraving stops and the head lifts off the cylinder when the Engrave Limit distance is reached or the Stop Engrave button is touched.



During engraving, you can use the Live Video function on the Engrave page to monitor the cells being engraved. To use, go to the Engrave page and then select Live Video.

Constant Tone Engraving - QuickCell Method

You can engrave a constant tone from the Spectrum without downloading a job.

To do this:



1. On the Screen Page:



- a) Enter the engraving screen for the constant tone job.



- b) Enter the screen angle for the job.

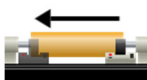


- c) Enter the cylinder circumference or diameter.

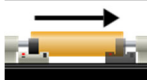


- d) Enter the stylus angle and change the stylus if necessary to match.

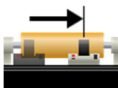
2. Load and clean the cylinder.



3. Move the carriage to the engraving start point and set the carriage position to zero using the Carriage toolbar.

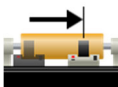


4. Set the carriage limit for the stopping point of the engraving. Verify that the distance prevents the engraving from going past the cylinder end.



CAUTION: When no engrave limit is set, the head could run off the cylinder, causing serious damage to the diamond tools on the engrave head.

Note: Remember to remove the Engrave Limit after engraving is finished.

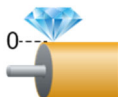


5. Determine the best location on the cylinder for a test block. Use the Carriage Left and Right buttons or the Go To function of the Carriage toolbar to move the engrave carriage to this location.



6. Open the Cell Setup page.

- a) Verify the values in the Target cell sizes.



- b) Perform a Tip Calibration if the stylus was changed in step 1d.



7. Open the Camera page then the Converge page.



8. Press the QuickCell button. The machine performs the normal QuickCell routine – Tip Cal (if necessary), Auto Focus, Light Calibration, and Single Cell – and then begins verifying testcut sizes.

Verify and adjust the cells/channel until the correct sizes are achieved.



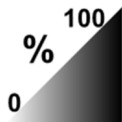
When the sizes are correct, press the OK button to exit the QuickCell routine.

1234.56 mm

9. Re-position the engraving head at Zero (defined in step 3).



10. Open the Utilities page followed by the Tune page.



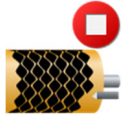
11. Verify Constant Tone is selected from the list on the left side of the page and the Tone value is at 100% (full cell).



12. Touch the Start Engrave button to begin engraving.



Note: If the cylinder is not rotating, touch  to begin rotation or  to cancel.



The engraver lowers the head against the cylinder and begins engraving a constant tone. Engraving stops and the head lifts off the cylinder when the Engrave Limit distance is reached or the Stop Engrave button is touched.

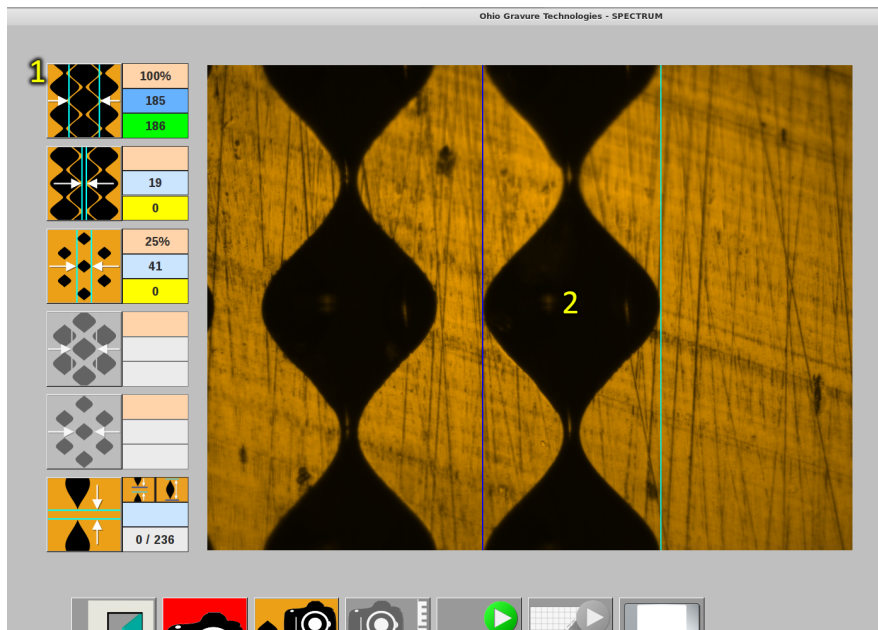


During engraving, you can use the Live Video function on the Engrave page to monitor the cells being engraved. To use, go to the Engrave page and then select Live Video.

Manually Measure Cells using the VISTA Camera



1. Position the cells under the camera for viewing. Do this manually or by pressing the Find 1 Rev button on the Cell Setup page.
2. Open the VISTA page, then touch the Live Video button to enable the camera. The head lowers against the cylinder. Adjust the cylinder position to view the desired cells.
3. Touch the appropriate button for measuring full cell, channel, highlight cell or gap button. To measure a full cell, touch the Full button (1), then the center of the desired cell (2). Make cursor adjustments as necessary.



Note: The selected cell should be near the vertical center of the display area. Cells too high or low will not measure as well. If you see this happen, move the cylinder to center the cell.

Note: The latest version of VISTA measurement software uses the screen and screen angle settings to improve accuracy. Be sure the screen and screen angle are correct for the cells being measured. Measuring a compressed cell when the machine is set for an elongated or normal cell causes poor initial measurements to be taken.



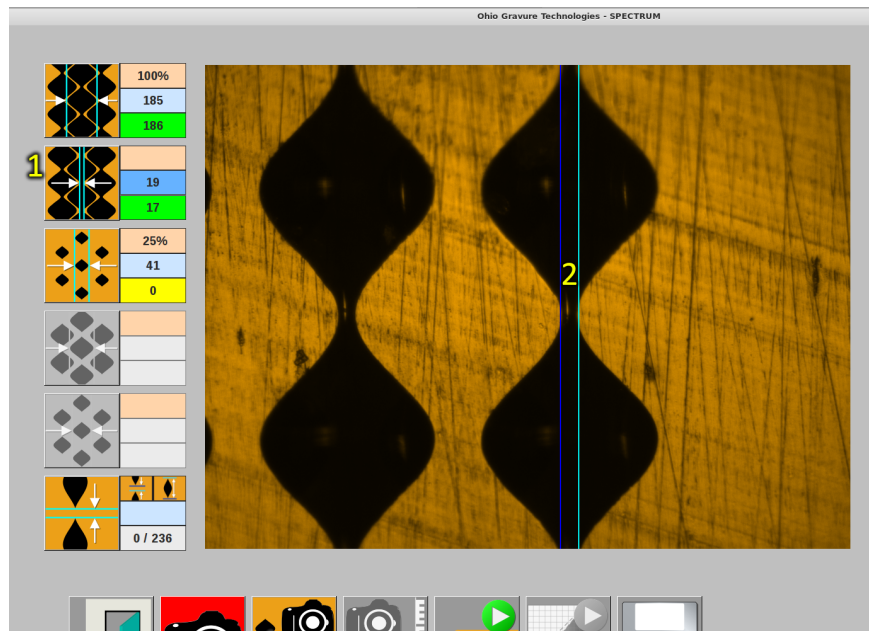
The image is frozen when the screen is touched, to allow for measuring.

The red background on the Live Video button indicates the image is locked.



Touch the button to unlock the image for repositioning the camera over a different cell or channel. The background shows green when unlocked and showing live video.

To measure a channel, touch the Channel button (1), then the desired cell (2). The Spectrum automatically finds and measures the corresponding channel for the selected cell.



Channels are the most difficult item to measure since they can be very narrow and often have significant reflection. If you have trouble with the cursors snapping to a narrow channel, move the cursors manually to measure the channel.

Repeat the same process for the highlight after moving the cylinder over the highlight cell area.

Measuring Cell Sizes with External Microscope

To use with an external microscope:

1. Locate the cylinder with the test block at the top of the cylinder.
2. Measure the full cell, highlight cell and the channel with the microscope.
3. Open the Cell Setup page.
4. Enter the full cell width by touching the text box where the Full Cell row and Measured Values column intersect. Enter the size of the measured cell.
5. Enter the channel width by touching the text box where the Channel row and Measured Values column intersect. Enter the size of the measured channel. Use the Gap measure if no channel is used for the full cell, such as an elongated cell.
6. Enter the highlight cell width by touching the text box where the Highlight Cell row and Measured Values column intersect. Enter the size of the measured highlight cell.
7. Enter the gap width by touching the text box where the Gap row and Measured Values column intersect. Enter the size of the measured gap. A gap value results in a *negative* channel being shown. A gap value and a positive channel are not possible.

The differences between the target values and measured values are calculated and displayed in the Change Values column. When the next test cut is made, the Spectrum uses the Change Values to adjust the engraving head controls to achieve the target sizes.

Converge

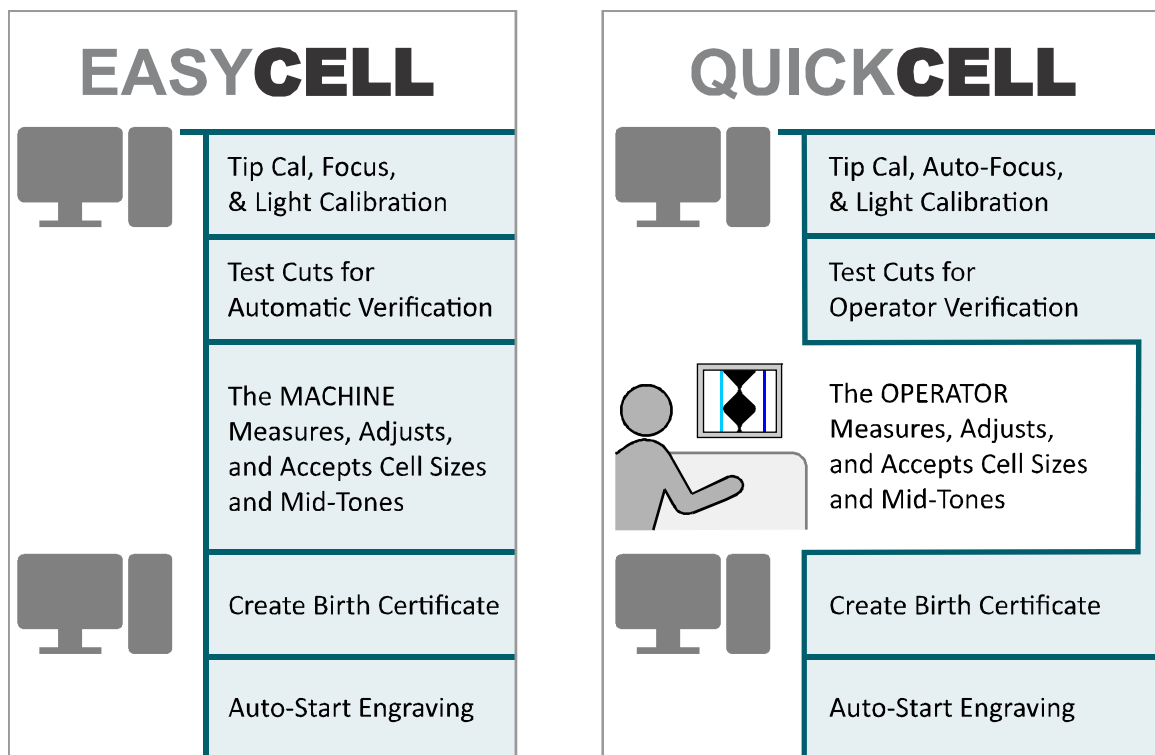
The Converge function is standard on the *Spectrum* engraver. Converge refers to the test cut sequence used by the Spectrum to achieve the proper cell sizes for a job. There are three different Converge routines to choose from:

- EasyCell Converge – An automated routine to setup the cells according to the job parameters. This is completely controlled by the Spectrum.
- QuickCell Converge – A user controlled routine where the user verifies the cells measured against the job parameters and either corrects or accepts the achieved cell sizes.
- Volume Converge (*Optional*) – An automated routine to setup cells according to a cell volume defined in Collage. A stylus profile is performed for every volume converge to verify stylus condition and angle.

Converge is more commonly referred to by the first word in the Converge, such as EasyCell or QuickCell.

Note: A Spectrum engraver can be configured to use EasyCell or QuickCell. These converges types cannot run simultaneously. However, once an EasyCell converge is started, the operator may interrupt the routine and use the QuickCell method to finish the converge.

The following graphic shows a simplified flowchart comparing EasyCell and QuickCell, to illustrate the processes that take place. Note that for EasyCell, there is no operator involvement.



This simplified flowchart does not show all system steps. Some of these steps are only performed if your engraver is configured to use them; for example, whether or not engraving automatically starts is configurable.

Common Steps in all Converge Routines

CAUTION: All Converge routines expects a new cylinder, free of engraving. An engraved cylinder may create problems if any step of the converge routine – particularly Light Calibration – occurs on an area with cells. If the cylinder is being over-engraved, the test cut position must be set to a different location than the test cut of the first engraving. This is done in the Collage layout system or by using the Image Drop on the Cell Setup page.

The Converge routine consists of several major steps:

- Tip calibration routine (if necessary) – align stylus to optimal position
- Automatic focusing of the camera (Auto-Focus) – ensure sharp images for measuring
- Automatic light calibration (Light Cal) – adapt camera to cylinder surface reflectivity
- Single Cell Locating – to determine test cut position
- Once these are completed, the Converge type continues: EasyCell, QuickCell or Volume

Single Cell Locating

1. A one-row wide test cut is made in a defined pattern, shown to the left.

1st
Single



The VISTA system locates the first full cell. You will see different images as the VISTA searches for the first full cell.

2nd
Single



When the cell is found, the VISTA system moves a defined distance to the second full cell and locates the cell.

3rd
Set
of 5



When the second cell is found, the VISTA system moves a defined distance to a group of five full cells. Again, the Vista system locates the group of five cells.

This method verifies that the VISTA system has found the correct cells and is not seeing imperfections or dirt in the copper.

QuickCell – Continue and Restart

QuickCell has two unique functions that the operator may experience. Both involve starting a second QuickCell converge after the converge has completed successfully, including exiting from the routine. A sub-window appears with these icons to choose from:



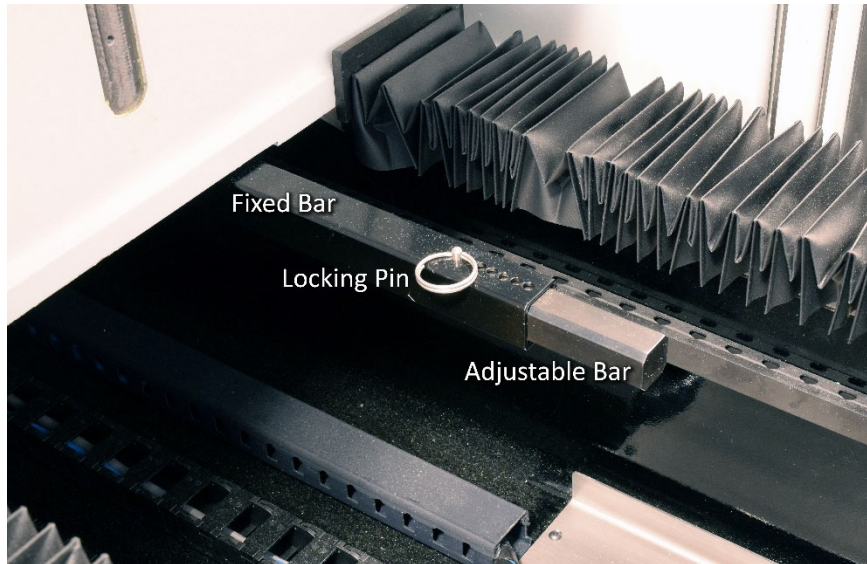
Continue – Selecting Continue starts the QuickCell Converge at the current state, making a testcut for you to verify and measure. Auto-focus, light calibration and single cell are not performed.



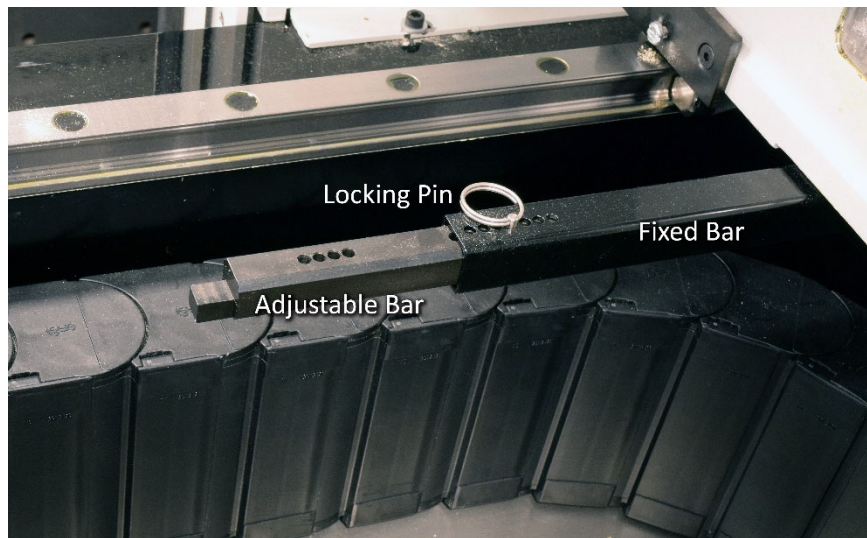
Restart – Selecting Restart starts the QuickCell Converge at the beginning, including auto-focus, light calibration and single cell before making testcuts for verification and measurements.

Mechanical Carriage Limits

The Spectrum has mechanical limits to prevent the carriage and engrave head from colliding with the headstock and tailstock. These limits consist of two parts: proximity switches located underneath the carriage and limit bar assemblies on the headstock and tailstock. The limit bars are factory set to prevent the engrave head from colliding with the headstock and tailstock.



The photo above shows the headstock limit bar: the fixed bar attached to the carriage, the adjustable bar that trips the sensor, and the locking pin that allows for the adjustable bar to be moved.



The photo above shows the tailstock limit bar. The fixed bar and locking pin are similar to the headstock. The adjustable bar is slightly different on the tailstock with a different end for tripping the sensor.

Cleaning the Touchscreen

Operating the engraver involves hundreds of touches on the touchscreen every day, so you will need to clean the touchscreen on a regular basis.

To clean the touchscreen:

1. Turn OFF the Touchscreen Display.
2. Use only a clean lint-free cloth on the touchscreen.
3. Turn ON the Touchscreen Display.

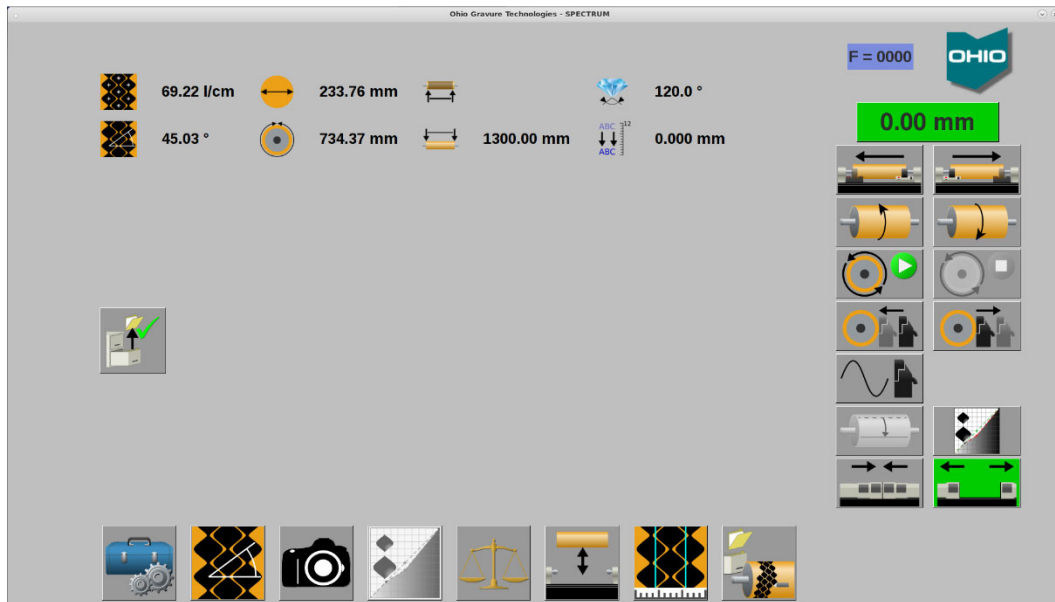


Chapter 3

Operator Display Reference

The operator display, also called GUI, is the primary method of controlling the Spectrum engraver. The GUI runs on a touchscreen and presents various pages to perform machine operations. You can also interact with the GUI using the touchpad located on the engraver carriage.

Virtually all machine operations are performed with the GUI.



The operator display, or GUI. This is the page seen after start-up, the Engrave page

Note: Current Spectrums use a rectangular monitor, while early Spectrums had a square monitor. The GUI images in this manual show the rectangular shape so appearance may vary. Older machines or earlier software versions may not show all the functions described in this manual.

CAUTION! Do not use sharp or pointed objects on the touchscreen, to prevent damage to the screen.

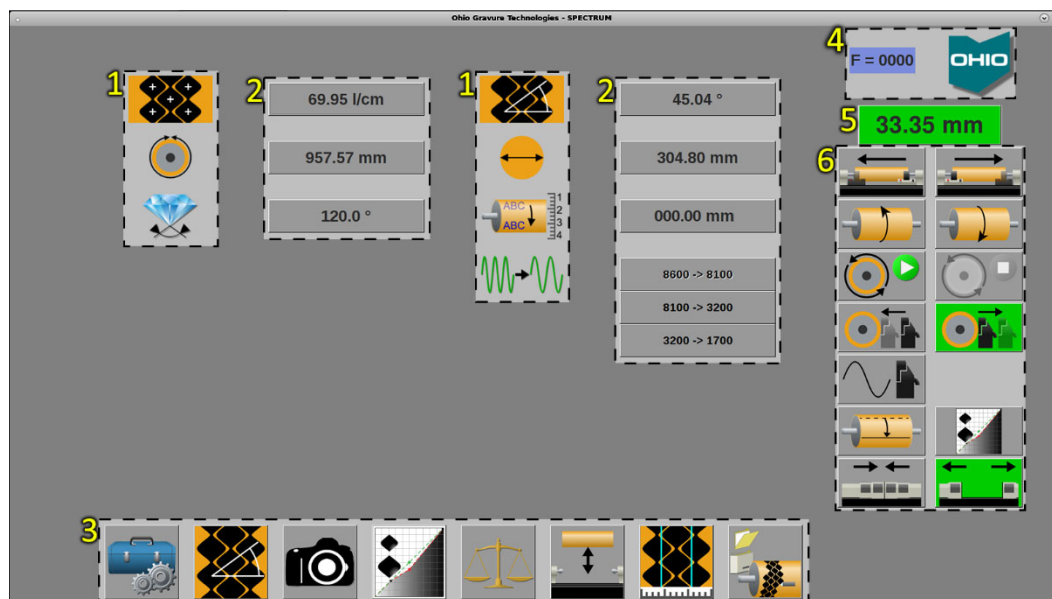
There are a number of pages that create the GUI. Several pages are used frequently while others for special functions or diagnostics are rarely used.

Frequently used pages are:

- Engrave Page
- Cylinder Handling Page
- VISTA Cell Measurement Page
- Cell Setup Page

Introduction: Using the Operator Pages

When the Spectrum is powered up, the GUI displays pages. A page may contain some or all of these elements: icons, text boxes, action buttons, and page buttons.



Various elements of a page. Screen page shown.

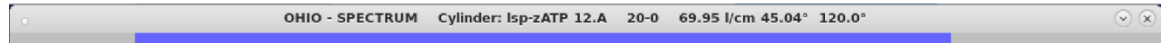
- 1 Icons** An icon is a graphic used to identify a text box or other item. Icons do not have frames around them like a button.
- 2 Text Box** A Text Box displays information such as the engraving screen or cylinder diameter. The function or purpose of a text box is identified by the graphic icon next to it. An icon is used instead of a text label.
Edit the value in the Text Box by touching the text box to open a numeric keypad – see *Entering Values with the Numeric Keypad* on page 69.
- 3 Page Buttons** Touch a Page button to move to another page, such as the VISTA page. Each page has specific items that don't appear on other pages. See *Page Buttons* on page 70.
- 4 Status** The Status area informs the operator about the selected job and the machine condition. The engraving frequency and machine status icon display here.
- 5 Carriage Position** Displays carriage information and opens the Carriage Menu. See *Carriage Position* on page 72.
- 6 Action Buttons** Touch an Action Button to cause something to happen. These buttons are present on most pages. See *Common Action Buttons* on page 72.

Machine Status

The GUI provides information about the machine in several ways.

Status Line

Information is provided in the title bar at the top of the window frame. For example, after loading a job, basic information about the job displays here.



Engraving Frequency

The Engraving Frequency in the Status area shows the cutting speed in cells per second. It displays green when the cylinder is at the correct speed. You cannot engrave when the speed is yellow; if you press Start Engrave or Test Cut, the machine waits until the proper speed is reached before starting.

The word Hybrid is displayed instead of numbers when the loaded job uses the Hybrid engraving function.

Status Icon

The icon at the top right corner changes to show Status and Error icons to keep the operator informed. Watch this area to know what the machine is currently doing.



The “Ohio” icon indicates an Idle state.



Here, the icon indicates that a job is loaded successfully.

Not all conditions change this icon, though most will.

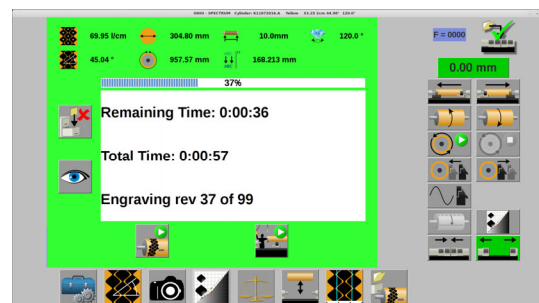
Color Changes in Windows

The color of the screen may change to indicate certain conditions. For example, on the Engrave page:

Blue indicates a cylinder has been selected

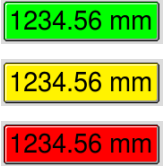


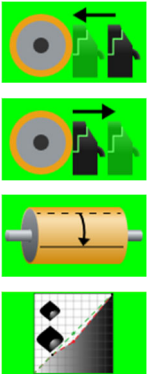
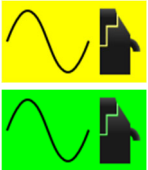


Green indicates engraving has started



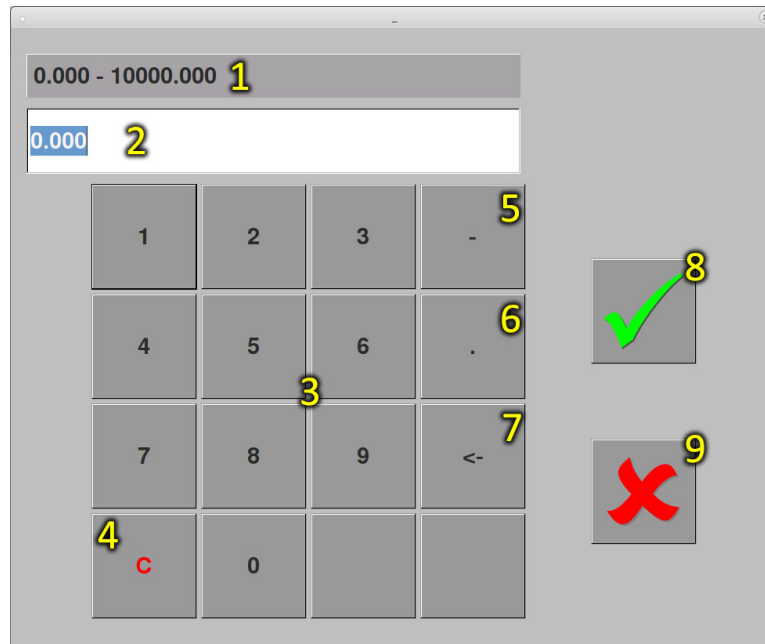
Color Changes in Buttons

Button backgrounds are normally grey, however some backgrounds change based on the situation.

<p>The Carriage Direction background is normally green but:</p> <ul style="list-style-type: none"> - Shows yellow when a carriage limit has been set. - Shows red when a carriage limit has been reached. 	
<p>The background of Carriage Direction buttons turn red when a carriage limit has been reached. This also indicates whether the limit is to the left or right side of the carriage.</p>	
<p>The Live Video/Camera button changes between grey, green and red.</p> <ul style="list-style-type: none"> - Grey is the normal color when the camera is inactive. - Green when the camera is active and displaying live video of the cells on the cylinder. - Red when the video is frozen and manual cell measuring is taking place. 	
<p>The backgrounds of the Head In, Head Retract, Float 1 Rev and Mid-tone Correction buttons will turn to a green when:</p> <ul style="list-style-type: none"> - Head In – The engrave head is lowered against the cylinder. - Head Retract – The engrave head is fully retracted for cylinder loading or stylus changes. - Float 1 Rev – When the circumferential start point is moved. - Mid-tone Correction – When the Mid-tone function is ON. 	
<p>The AC/Vacuum ON button background turns yellow or green indicating the head warmup status. Both yellow and green indicate the head is turned ON.</p> <ul style="list-style-type: none"> - Yellow indicates the head is still in the warmup period. - Green indicates the head has completed the warmup period. 	

Entering Values with the Numeric Keypad

Several of the touch-screen commands require you to enter numeric information, such as cell values or engrave limits, using the Numeric keypad.



- | | | |
|------------------|----------------------|--------------------|
| 1 Range of entry | 4 Clear Entry field | 7 Backspace |
| 2 Entry field | 5 Minus/Negative Key | 8 Accept and close |
| 3 Keypad | 6 Decimal | 9 Cancel and close |

To open the numeric keypad, touch a text box. For example, to enter the screen (on the Screen page), touch the Screen text box and the numeric keypad opens.


The Range area tells you the valid numbers that can be used. For example, for a Screen/Raster, the valid range could be 30 to 300. Negative numbers are allowed – depending on the control – and up to three numbers to the right of the decimal can be entered.

To enter a positive value, touch the number keys on the keypad.

To enter a negative number, touch the minus key first followed by number keys.

To clear a value, touch the Clear Entry key to remove the last number.

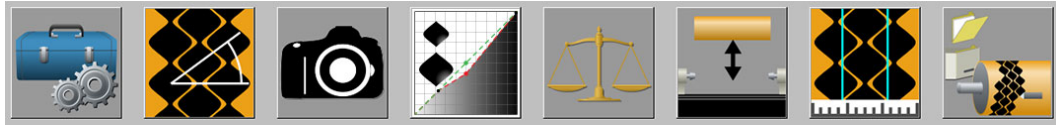
To correct a mistake, touch the backspace key to remove the last number.

To accept a value, touch the green checkmark . The numeric keypad closes.

To exit without saving the entered value, touch the red X .

Page Buttons - Moving From Page To Page

At the bottom of each page are buttons to access other pages. These buttons are available on most pages, but can change according to the current page.



This is the primary group of page buttons



Utility Page – Opens a second group of page buttons with less frequently used functions such as machine configuration and exiting the software. See the next page.



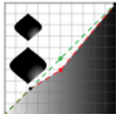
Screen Page – Set screen, screen angle, cylinder diameter and/or circumference, and stylus angle. See *Screen Page* on page 77.



VISTA Page – Use this page for several purposes:

- Cell setup/Testcuts using EasyCell and QuickCell setup routines.
- Burr Cutter Calibration
- Camera Calibrations
- Manually Viewing Cells – View and measure engraved cells on the cylinder.

See *VISTA Page* on page 89.



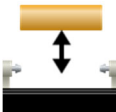
Mid-Tone Correction Page – Create a mid-tone adjustment curve to linearize engraving results across multiple machines.

See *Mid-Tone Correction* on page 102.



Measure Currents Page – Measure and balance engrave head currents.

See *Measure Currents* on page 100.



Cylinder Handling page – Load and unload cylinders plus other cylinder related items.

See *Cylinder Handling page* on page 79.



Cell Setup Page – Make test cuts, enter size corrections, and review cell sizes for the job. See *Cell Setup* on page 82.



Engrave Page – Select and download a job and start engraving jobs.

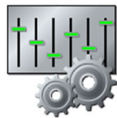
See *Engrave Page* on page 106.



This is the secondary group of page buttons



Exit – Returns to the primary group of page buttons.



Configuration Page – Opens the Configuration page where machine information and settings are found.



Log Page – Use to view the log generated during machine operation. Helpful when diagnosing machine problems.

See page 114.



Learn Page – View and manage the Learn Table where control variables for the engrave head are stored.

See *Learn Table* on page 115.

or



Learn/Stylus Life Page – Allows access to either the Learn Table (as above) or the Stylus Life table. The Stylus Life allows users to track the hours of use for cutting stylus.

See *Stylus Life Table* on page 116.



Tune Page – Opens the Tune page where basic engrave head information is found as well as the ability to engrave Constant Tone without a Collage job.

See page 119.



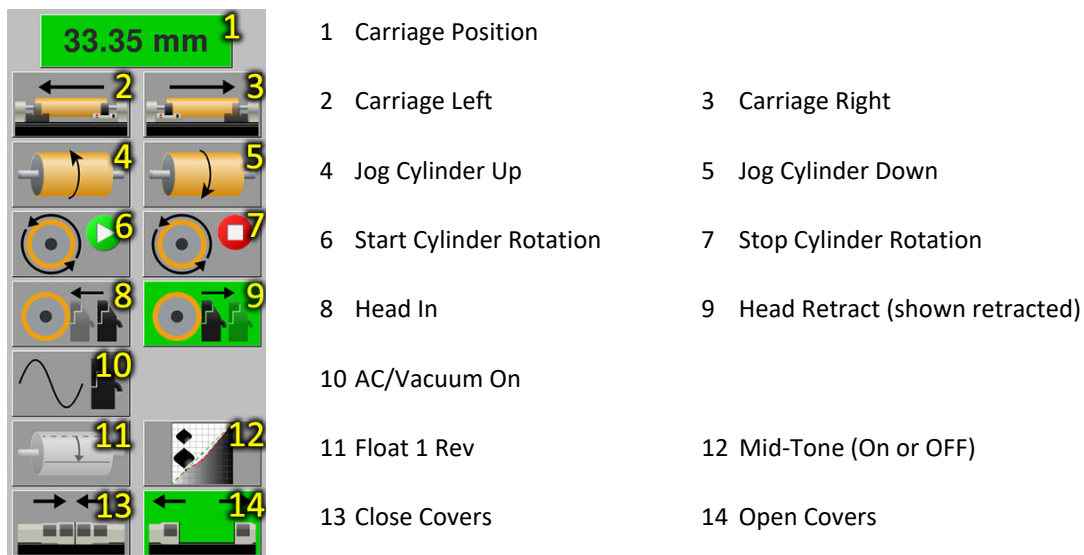
Computer Management – Use to perform simple application software and computer tasks such as quitting the application software and restarting or shutting down the embedded computer.

See *Exit Software* on page 121.

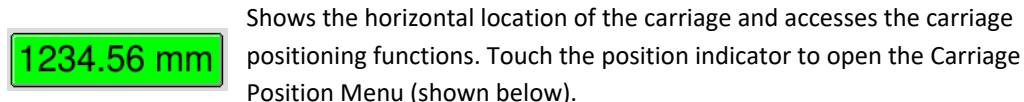
Common Action Buttons

Touch an Action Button to cause something to happen. The action buttons appear on most of the pages. For example, touch a button to move the engrave head closer to the cylinder. Many actions have opposite actions, and the buttons are located next to each other. Some of the action buttons include an indicator that turns green, yellow or red when the button's function is active.

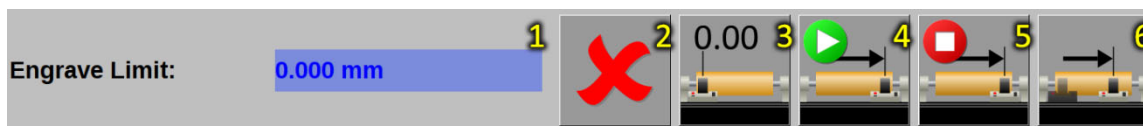
The following action buttons appear on many of the pages. Unique action buttons are explained on the operator pages where they appear.



Carriage Position and Menu



Carriage Position Menu



- | | |
|--------------------------|----------------------------------|
| 1 Engrave Limit Distance | 4 Set Engrave Limit Distance |
| 2 Exit | 5 Clear and Cancel Engrave Limit |
| 3 Zero Position | 6 Go To Position |

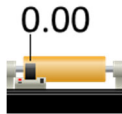
Note: Functions should not be used during engraving.

Exit



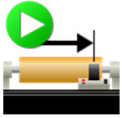
Closes the Carriage Position menu.

Zero Position



Resets the current Carriage Position to zero (0). Use this to set the start point of engraving or as a reference point when measuring a distance.

Set Engrave Limit



Allows the user to define a horizontal distance limit where engraving stops. Touch this button to enter the distance from zero. The distance is shown in the Engrave Limit Distance.

Note: It is not necessary to set this distance to stop production engraving.

1234.56 mm

The Carriage Position turns yellow when an Engrave Limit is set.

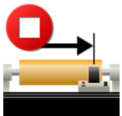
CAUTION: The value cannot be changed if engraving is active.

1234.56 mm

The Carriage Position turns red when the carriage has reached the user-defined limit. Engraving cannot be restarted until the user limit is cleared or the carriage is moved.

Note: The user-defined limit is an electronic control to stop engraving and carriage motion. The Spectrum is also equipped with mechanical limits to stop carriage motion and prevent damage from over-travel of the carriage. For information on these limits, see *Mechanical Carriage Limits* in Chapter 4.

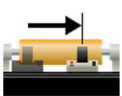
Cancel Engrave Limit



Resets the Engrave Limit Distance to zero and turns off the Engrave Limit.

CAUTION: The limit cannot be cancelled if engraving is active.

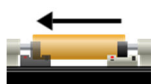
Go To Position



Use this function to move the carriage to a specific position. Enter a horizontal position and the carriage moves to that location.

WARNING: The engraver carriage moves rapidly when using the Go To Position function. Keep fingers and hands away from the carriage to prevent injury.

Carriage Left and Carriage Right



Use these buttons to move the engrave carriage to the left or right. Release the control to stop carriage movement.

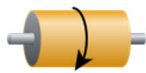


The carriage can also be moved using the buttons on the control panels found on the front and back of the carriage.



The carriage buttons also identify if a mechanical travel limit has been reached. The button turns red and indicates whether the limit is to the left or right side of the carriage. The graphic shows the left limit has been reached.

Jog Cylinder Up and Jog Cylinder Down



Touch and hold these buttons to rotate the cylinder up or down at a slow speed.



Release the control to stop cylinder movement.

Start Cylinder Rotation



Touch to start cylinder rotation. A prompt appears confirming the cylinder start. Press ✓ to begin rotation or X to cancel rotation.

Stop Cylinder Rotation



Touch this button to stop cylinder rotation.

Head In



Use to move the engrave head in, against the cylinder. The green background indicates the head is properly loaded against the cylinder.



When the engrave head is against the cylinder, touch the control to retract the head a short distance away from the cylinder.

Head Retract



Touch this button to move the head to the rear of its travel, away from the cylinder. This is also called full retract.



The green background indicates the head is fully retracted from the cylinder. This position is used for changing diamonds or when loading/unloading cylinders.

AC/Vacuum On

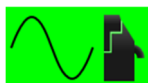


Use to turn on the engrave head and vacuum. This function is automatically activated when starting test blocks or engraving.

The button also starts the engrave head warmup timer to ensure the head is ready for engraving. The timer monitors the engrave head and identifies when warm-up is needed. This function is ON by default, but can be changed here: Configuration>General Tab>Engrave Head Warmup.

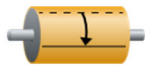


A yellow background indicates the AC/Vacuum is ON and the head warmup period is active.

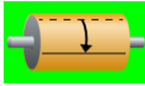


A green background indicates the AC/Vacuum is ON and the head warmup period has been completed.

Float 1 Rev



Use to move the circumferential start position away from the fixed 1-Rev point of the machine. A green button shows the function is ON.

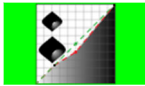


Note: Float 1-Rev and Image Drop are similar. Float 1-Rev is a less precise image drop function to set the starting point. Image Drop is a precise function allowing a specific distance to be set.

Mid-Tone Correction

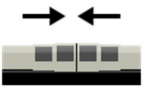


Touch this button to enable mid-tone correction. Mid-tone correction adds a linearization curve to allow matching of work between engravers.

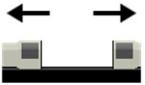


Mid-Tone function is performed during testcuts and the function automatically turns on.

Close/Open Covers



Use to move the motorized covers. Press the appropriate button to open or close the covers. Touch a button a second time to halt the movement, for example touching the Open Covers button while the covers are opening stops their travel.

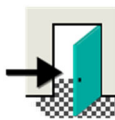


Note: To reverse travel, stop the covers, then press the appropriate button.

The covers open and close automatically during various machine functions.

Exit Buttons

The following Exit buttons are used throughout the pages.



Exit– Press this button to move back one page.



Exit and Save – On the VISTA Cell Measure and Mid-Tone pages, use this button to accept the values entered on the page and return to the previous page.



Exit Without Saving – Use this button to ignore values entered on the page and return to the previous page.

Yes/OK, No, Continue, Restart Buttons

The function of these buttons may change depending upon the context.



Yes/OK – Press this button to answer “Yes”, to confirm the previous action.



No – Press this button to answer “No,” to cancel an action, or close a window without saving or performing an action.



Continue – Used during the QuickCell Converge routine.



Restart – Used to:

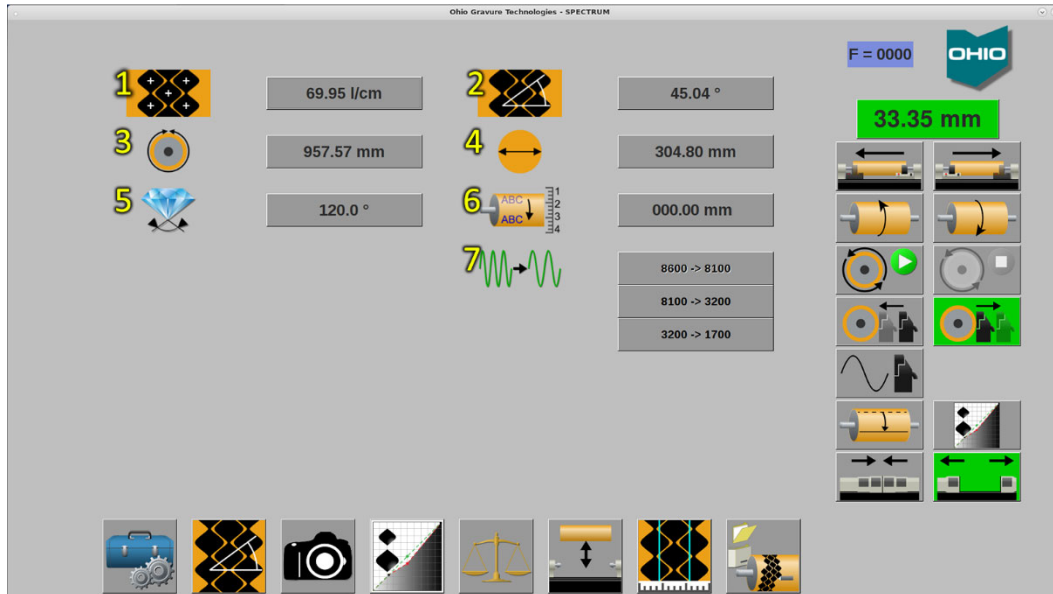
- Restart the embedded PC
- Restart the QuickCell Converge routine

Screen Page



This icon opens the Screen page. Use this page to:

- Set the screen/raster and screen angle
- Set the cylinder diameter or circumference
- Set the image drop



- | | | | |
|---|------------------------|---|--------------------|
| 1 | Screen/Raster | 2 | Screen Angle |
| 3 | Cylinder Circumference | 4 | Cylinder Diameter |
| 5 | Stylus Angle | 6 | Image Drop |
| | | 7 | Frequency Override |

Screen/Raster



The screen (or raster) displays here. This value is set by the downloaded job. It cannot be changed in a downloaded job. This can be set manually for engraving without a job loaded.

Valid screen range is 10 to 1000.

Screen Angle



Displays the screen angle. This value is set by the downloaded job. It cannot be changed in a downloaded job. The angle can be set manually for engraving without a job loaded.

Valid screen angles are from 30 to 66 degrees.

Cylinder Circumference & Cylinder Diameter



The cylinder circumference and diameter display here. These values are set by the downloaded job. These values cannot be changed in downloaded jobs.



Since the two values are related, the second always calculates when the other is changed.

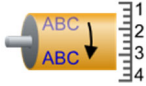
The values can be set manually for engraving without a job loaded.

Stylus



The stylus angle displays here. The stylus value is set automatically by the job layout. If the installed stylus angle does not match the layout, the machine prompts you to install the correct angle stylus.

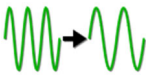
Image Drop



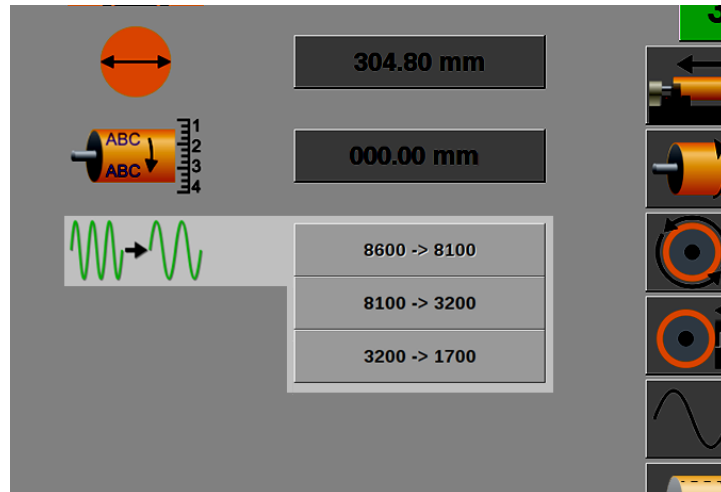
Use Image Drop to move the circumferential start point away from the natural 1-Rev. Enter this distance in millimeters.

Note: Image Drop and Float 1-Rev are similar. Float 1-Rev is a quick image drop function to move the starting point. Image Drop is a precise function allowing the operator to set a specific distance.

Frequency Override – Changing Engraving Speed



The Frequency Override buttons allow the operator to change the engraving speed. This may be necessary due to copper quality or to slow the cylinder rotation. The machine automatically determines the engrave head speed based on cell/stylus specifications and the available speeds of your engrave head.



The possible override choices are:

8600 Hz -> 8100 Hz

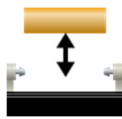
8100 Hz -> 3200 Hz

3200 Hz -> 1700 Hz

8100 Hz -> 1700 Hz (not shown)

Note: The Frequency Override buttons are setup during machine testing at the OHIO factory.

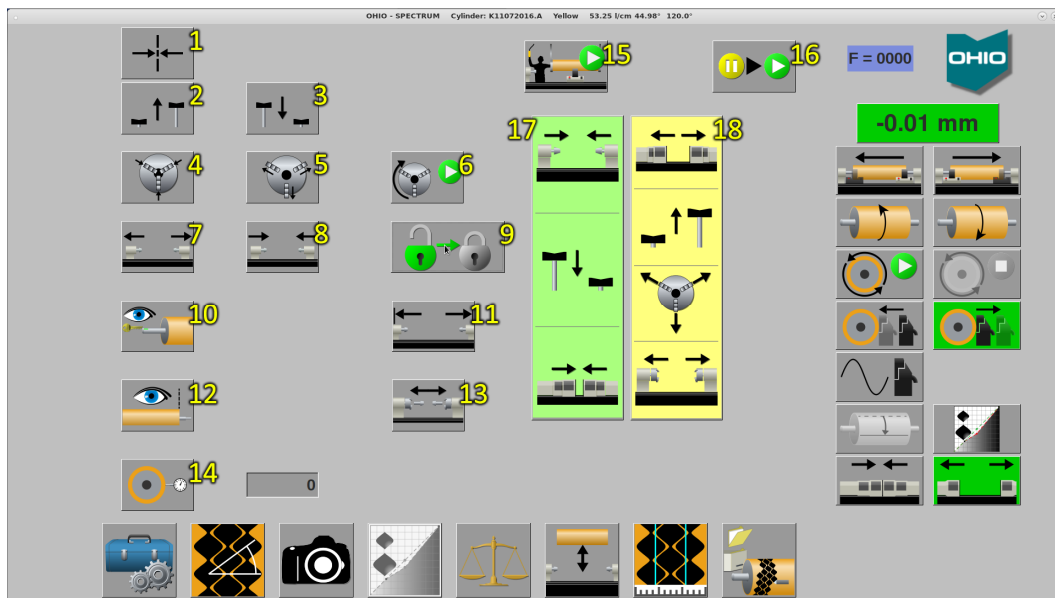
Cylinder Handling Page



This icon opens the Cylinder Handling page. Use this page to:

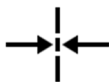
- Load and unload cylinders
- Move the headstock and tailstock
- Control items used in the cylinder load/unload routines

The Cylinder Handling page contains the following elements. Some items are optional and may not appear.



- | | | |
|--------------------------|------------------------|---------------------------------|
| 1 Home Carriage | 7 Open Stocks | 13 Insert/Remove Arbors/Cones |
| 2 Raise Supports (opt) | 8 Close Stocks | 14 TIR Measurement (opt) |
| 3 Lower Supports (opt) | 9 Lock/Unlock Stocks | 15 Start Semi-Automation |
| 4 Close AutoChucks (opt) | 10 Keyway Detect (opt) | 16 Resume Automation |
| 5 Open AutoChucks (opt) | 11 Home Stocks | 17 Perform Load, cones (opt) |
| 6 Locate AutoChuck (opt) | 12 Perform End-Seeking | 18 Perform Unload, chucks (opt) |

Home Carriage



Use Home Carriage to move the carriage to machine center. This occurs automatically in semi- and fully-automated lines during the cylinder loading/unloading process. Homing the carriage is also good practice during the manual loading and unloading of cylinders.

Note: The Home Carriage button is only active when the engrave head is fully retracted from the cylinder.

Raise/Lower Cylinder Supports

Optional Equipment

Use the Raise and Lower Supports buttons during cylinder loading and unloading. The supports are positioned to hold a cylinder at the proper height using either cones or chucks.



The Raise Supports button moves the supports to the correct height for the defined cylinder diameter.



The Lower Supports button moves the supports back to their retracted home position.

Cylinder Supports are used in both semi- and full-automation.

A sensor in the left support (headstock side) detects if a cylinder is present.



A dial indicator in the right support (tailstock side) measures the cylinder diameter during semi- and full-automation. Loaded cylinders not matching the Collage job are indicated by a flashing light on the monitor tower and a status icon showing Error 36.

The measurement error tolerance is set under Configuration>Automation>Cylinder Size Check Tolerance. Tolerance is set in millimeters.

Open/Close Chucks - AutoChucks

Optional Equipment

Use the Open Chuck and Close Chuck buttons during cylinder loading and unloading. The chucks automatically open or close to grip or release the cylinder shafts.



The Close Chuck tightens the chucks to secure the cylinder shaft.



The Open Chuck button loosens the chuck to release the cylinder shafts.

CAUTION: Make sure the cylinder is held by a crane or the optional cylinder supports before opening the chucks.

Locate AutoChuck

Optional Equipment



Press to rotate the headstock chuck so the chuck tool can engage the chuck.

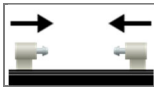
Note: This function only locates the headstock chuck. The tailstock chuck either tracks the headstock with a cylinder installed, or remains still during the Locate AutoChuck function.

Open Stocks and Close Stocks

Use the Open Stocks and Close Stocks buttons during cylinder loading and unloading.

On newer Spectrum machines, the headstock and tailstock move symmetrically, with both moving towards or away from the center of the machine. On older model Spectrums, only the tailstock moves.

Note: You can also move the stocks using the buttons on the rear carriage panel.



Close Stocks moves the stocks towards the center of the machine to grip the cylinder.



Open Stocks moves the stocks away from the machine center to release the cylinder.

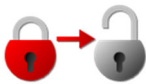
Lock/Unlock Stocks

The Lock/Unlock Stock button enables or disables the ability to move the stocks from the GUI during cylinder loading or unloading. The button toggles between locked and unlocked states.



When Green, the stocks ARE UNLOCKED and can be moved using the Open/Close Stock buttons on the GUI.

Press the green Lock Stock button to lock the Open/Close Stock buttons and disable movement.



When Red, the stocks ARE LOCKED and cannot be moved using the Open/Close Stock buttons on the GUI.

Press the red Unlock Stock button to unlock the Open/Close Stock buttons and enable movement.

Note: The button defaults to the locked condition, preventing stock movement. The stocks automatically lock after one minute of inactivity with the GUI.

Note: The stock control buttons on the rear control panel are not controlled by Lock/Unlock Stocks.

Home Stocks



Touch this button to move the stocks to their outermost position. This creates the largest space between the chucks or cones.

Keyway Detect

Optional Equipment



Touch this button to locate the keyway in a cylinder shaft or a cylinder bore. When found, the 1 Rev is automatically set at the keyway position.

This function is performed as part of the semi- or full-automation sequences. It is not normally performed as a stand-alone function.

Cylinder Length Measuring



Cylinder length is verified in semi- and fully-automated operation. If the cylinder length is correct, the engrave head automatically positions for test cuts and engraving. Cylinder length is measured as part of the end-seeking routine.

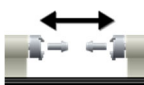
WARNING: The carriage moves automatically left and right during cylinder length measurement. Avoid placing your hands near the carriage to prevent injury.



If the cylinder length does not match the Collage job the operator is notified by a flashing light on the monitor tower and a stat icon showing Error 16.

The acceptable error between the measured face length and the face length in Collage is set on Configuration>Automation>Cylinder Face Length Check Tolerance. Error is set in millimeters.

Insert/Remove Arbors/Cones into Chucks

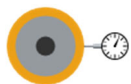


Touch this button to install or remove arbors into Chucks.

Note: The arbor length needs to be set in the configuration when running semi-or fully-automated systems. Find this at Config>Automation>Arbor Length.

TIR Measurement

Optional Equipment



Use the TIR Measure button to manually verify the run-out of the cylinder. When pressed, the machine lowers the engrave head against the cylinder and spins the cylinder, measuring the amount of cylinder run-out.



The light on the monitor tower flashes and a status icon showing Error 33 is displayed for cylinders out-of-range.

TIR is an optional step in semi- and full-automation.

The acceptable runout is set on Configuration>Automation>Automation TIR Tolerance. Error is set in microns.

Run Semi-Automation



Use this button to start a semi-automated engraving sequence.

The Semi-Automation button is also available from the Engrave page.

Note: Semi-Automation must be enabled in the Configuration page to display this button.

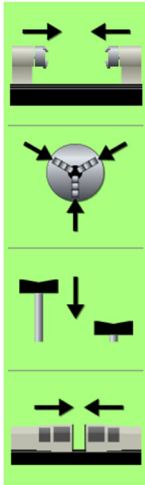
Resume Semi-Automation



Use this button to resume automation if the routine has been paused. This occurs if Pause After Testcut is enabled, which allows the operator to review the EasyCell Converge results before starting the engraving production job. When pressed, the sequence continues and the carriage moves to the engraving start position and begins cutting the production job.

Perform Load

The Perform Load/Unload buttons vary depending on the cylinder fixturing. The following graphics show two different machine configurations. The Perform Load shows the function when chucks are installed. The Unload shows the function with cones installed on the machine. In all cases, the optional cylinder supports or cylinder piers are required to use Load or Unload functions.



Use the Perform Load button to move through the loading sequence of a semi-automated Spectrum. Touch the button to begin the sequence, the machine then moves through the loading sequence, prompting the operator at each step. The major steps are shown in the icons on the button, working in order from top to bottom.

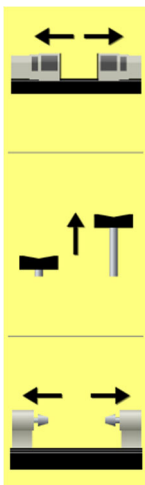
The button shown varies depending on your machine configuration. Variations include:

- Cones or chucks
- Cylinder piers or cylinder supports

The button to the left shows a machine equipped with cylinder supports and chucks.

WARNING: Use of the Perform Load function results in automatic movement of various pieces on the engraver. Care should be taken to prevent personal injury.

Perform Unload



Use the Perform Unload button to move through the unloading sequence of a semi-automated Spectrum. Touch the button to begin the sequence, the machine then moves through the unloading sequence, prompting the operator at each step. The major steps are shown in the icons on the button, working in order from top to bottom.

The button shown varies depending on your machine configuration. Variations include:

- Cones or chucks
- Cylinder piers or cylinder supports

The button to the left shows a machine equipped with cylinder supports and cones.

WARNING: Use of the Perform Load function results in automatic movement of various pieces on the engraver. Care should be taken to prevent personal injury.

Cell Setup Page



This icon opens the Cell Setup page, also called the 'Test Cut' page. Use the page to:

- Engrave manual test blocks.
- Change the cell sizes to meet job requirements.
- Store cell setups to the Learn Table.

The Cell Setup page contains the following elements:



- | | | |
|--------------------------|--------------------|---------------------------|
| 1 Target Values | 2 Measured Values | 3 Change Values |
| 4 Full Cell | 5 Channel | 6 Highlight Cell |
| 7 Highlight Percentage | 8 Cell Wall | 9 Scum Dot |
| 10 Image Drop (test cut) | 11 Tip Calibration | 12 Perform Test Cut |
| 13 Find Start | 14 Learn a Screen | 15 Clear Displayed Values |

Items 4 through 6 define the purpose of the three columns labeled 1, 2 and 3.



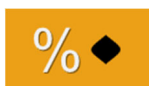
Full Cell – The cell engraved at 100% density. Also called a 'shadow' cell.



Channel – The width of the channel between full cells. This value can be both positive and negative (negative creates a gap between cells, common with elongated 60° screens).



Highlight Cell – The cell engraved at the highlight percentage.



Highlight Percentage – The input value used to engrave the highlight cell. Normally set to 25%, this means the highlight cell width should be 25% of the full cell width.



Cell Wall – The width of the diagonal wall between full cells. This is a calculated value and cannot be manually entered.

Target Values



The second column is the Target Value for the full, highlight and channel defined in the downloaded job. If no job is loaded, the target values are automatically calculated by the Spectrum from the screen and screen angle.

Target cell sizes are not locked and can be changed for a loaded job.

Note: Be sure to check all entries when making changes to the target values. Changing sizes of any target may cause another target value to be re-calculated.

Measured Values



The third column is for Measured Values. These are the cell sizes measured using the VISTA microscope or an external microscope. Measured values from the VISTA microscope are automatically entered into the appropriate locations.

Change Values



The fourth column is Change Values. The values shown in this column are the difference between the target and measured cell sizes. When the next test cut is made, the Spectrum uses the Change Values to adjust the engrave head controls to achieve the target sizes.

For example:

***0.0 um** indicates that no change will be made to the item.

4.6 um – The measured item is smaller than target. The machine increases the cell or channel by this amount.

-3.9 um – The measured item is larger than the target. The machine decreases the cell or channel by this amount.

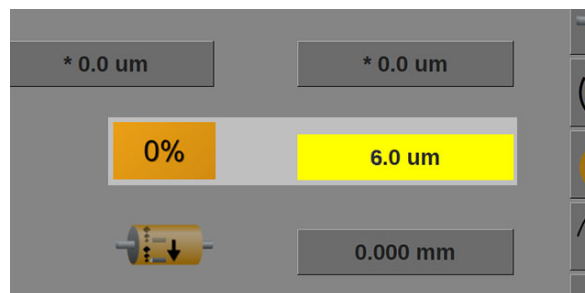
These values can be also entered manually to achieve the target value.

Scum Dot

0%

Shows if a dot engraves in the white (0%) areas of the image. This occurs when the highlight cell is too large in relation to the full cell. This is corrected by reducing the highlight cell size to the proper relationship.

The background becomes yellow to alert the operator of the possible problem.



The graphic shows the machine is engraving a 6 μm scum dot.

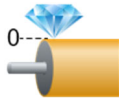
Image Drop – Test Cuts Only



Adds a circumferential image drop for test cuts. This function only drops the test cut, it will not drop production engraving. The image drop distance is automatically reset to zero when the job is unloaded.

This Image Drop also works with QuickCell or EasyCell routines. Once the converge routine is finished, the drop is disabled.

Tip Cal

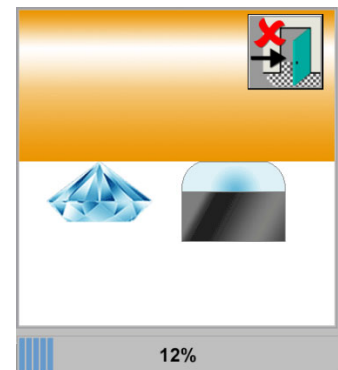


Press this button to perform a manual tip calibration. Automatic tip calibration is performed as part of the EasyCell and QuickCell Converge sequences.

A progress bar displays during the tip cal routine. An animation may show during the routine (configurable item). Both are shown in the graphic to the right.

Note: The progress bar should never reach 100%. Normal operation is between 15% and 45%. For numbers greater than 50%, rotate the cylinder slightly and repeat the Tip Cal process.



The engrave head is ON and lowered against the cylinder during the procedure. When complete, the head retracts and is turned OFF.



Perform Test Cuts

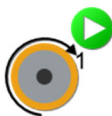


Touch this button to engrave a test block. The machine starts cylinder rotation, the engrave head moves against the cylinder and cuts a test block set – highlight and full cells – before lifting the head and stopping cylinder rotation. By default, the Spectrum automatically stops the cylinder to position the test cut under the VISTA camera.

Note: Confirm starting cylinder rotation by selecting  to start or  to cancel.

The Perform Test Cuts button is also found on the VISTA page. Manual test cuts can be made directly from there.

Find Test Cut



Use this button to rotate the cylinder and place the test cut in front of the VISTA camera.

The Spectrum automatically positions the test cut in front of the VISTA camera after completing a manual test cut. You can stop at three different locations using Configuration>General>Testcut Rotation End. The three options are:

- None – The cylinder stops in no particular rotational position.
- VISTA-Camera – For using the built-in VISTA microscope. (Default setting.)
- External-Camera – For using a stand-alone microscope. The cylinder stops with the test blocks at the top of the cylinder.

Learn a Screen

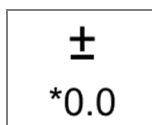


Touch this to store the head control values to the Learn Table for the current screen, screen angle, and stylus on the Screen page. The head control values define the cell being engraved. Storing and using these values for subsequent engravings of the same screen/angle/stylus group reduces setup times.

The Spectrum attempts to match existing data, comparing the new screen with stored screen/angle groups. The Spectrum automatically uses the head control values of a stored group within 2% of the new. The stored values are used until the Learn table or entry is erased.

Note: The head control values are automatically stored to the Learn Table after a successful automated test cut converge, either EasyCell or QuickCell. This button is not active if the screen/angle group is already learned.

Clear Displayed Values



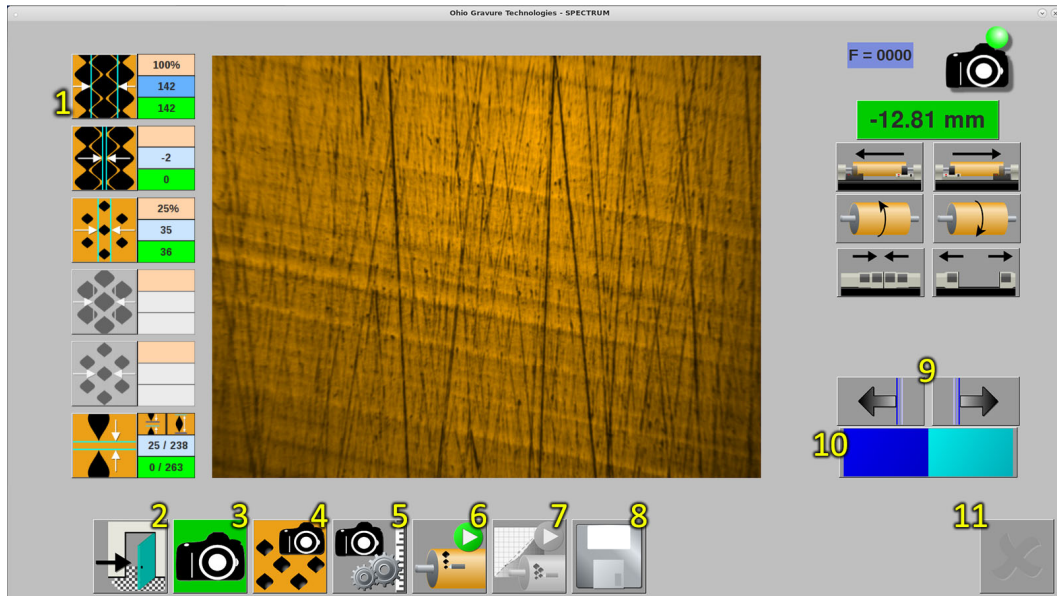
Touch this button to clear the measurements in the Change Values column. All Change Values entries return to *0.0 um.

VISTA Page



This icon opens the VISTA Page. Use the VISTA page to:

- Start a Converge process or make manual test cuts.
- View and measure cells.
- Perform focus and light calibration functions, control the shoe and burr cutter, and align the camera position.



- | | |
|------------------------------------|--|
| 1 Measure Functions | 7 Perform Mid-tone Converge (shown inactive) |
| 2 Exit | 8 Save Image (shown inactive) |
| 3 Start/Stop Live Video | 9 Line Arrows |
| 4 Converge (EasyCell or QuickCell) | 10 Line Select |
| 5 Utilities | 11 Cancel (shown inactive) |
| 6 Perform Manual Test Cut | |

Video Display Area

The large window near the center displays the camera view when live video is active.

Measure Functions

Displays the cell measurements during EasyCell or QuickCell Converges, or manual cell measurement.

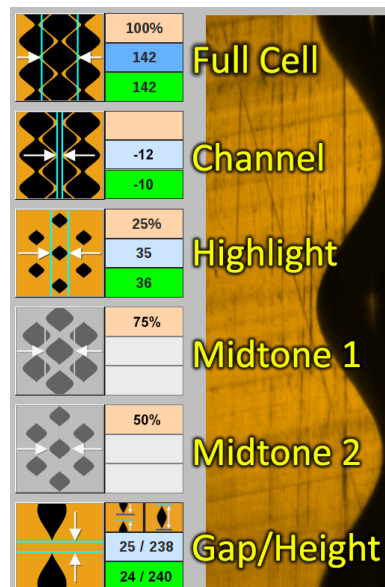
There are five areas in the Measure Functions. Each area consists of an icon and one or more measurement boxes. The icon identifies the area, whether a cell or channel, that can be measured. The measurement boxes show you information about the cell/channel sizes.

The icons identify the six features that can be measured:

- Full Cell
- Channel
- Highlight Cell
- Mid-Tone 1
- Mid-Tone 2 (depending on configuration)
- Gap / Cell Height

Numbers appear beside the icons. From top to bottom they are:

- Percentage value – downloaded as part of the Collage job. Not shown for Channel or Gap/Height.
- Target value – downloaded as part of the Collage job. This has a blue background.
- Measured value – The size of the cell measured. Shown with a green or yellow background.



The active measurement has a dark blue Target Value field. In the example, the Full Cell is active.

For the Gap / Height entry, the numbers display slightly differently. Here the numbers are in columns identifying the Targets and Measured Values for gap (left column) and cell height (right column). See *Gap / Cell Height* for more information about this function.

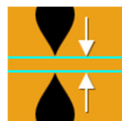
Changing Target Value

You can change the target value – value with blue background – by touching the box and entering the amount to change. You can change the target value by as much as +/- 20µm.

For example: Target full cell size is 142 µm but you need 146. Touch the target box and enter 4 to increase the target size by 4µm > 142µm + 4µm = 146µm

Gap / Cell Height

The Gap measurement function behaves slightly differently than the controls for measuring the other five features. Gap measurement uses horizontal lines rather than vertical lines to measure the space between cells. The Gap function is only used with cells where no channel links the full cells, so primarily for 60° elongated screens. Using the Gap function improves repeatability between engravings since the channel is not available as a control point for most elongated screens.



Gap / Height –Touch this button to measure the space between cells.

Gap and Channel are connected. *Anytime a gap is measured*, the channel is displayed as a *negative value*. When a positive channel is measured, a gap cannot exist or be measured. A change in the measured Gap reflects in a change in the channel measurement.



While you can only measure the gap, the cell height is displayed beside the gap. The cell height is calculated based on the known cell spacing and the measured gap.

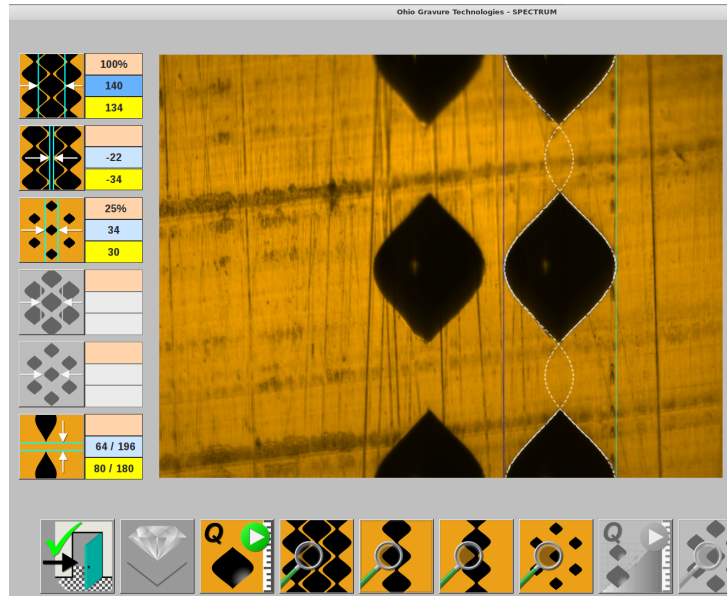
$$\text{Cell Spacing} - \text{Gap distance} = \text{Cell Height}$$

Cell height cannot be changed.

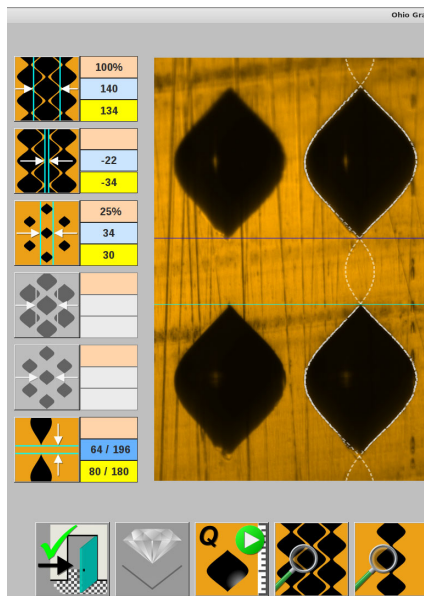
See the next page for several pictures of cell gap measurements.

Measurement Controls

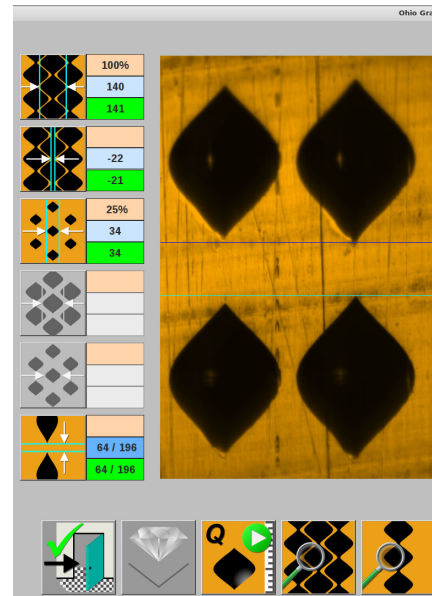
The latest version of Spectrum software uses curve-fitting to measure the cells and channel for both EasyCell and QuickCell converge methods. Curve-fitting adds a white outline running along the edge of the features, as shown in the following picture. Curve fitting also adds the ability to measure the cell height or gap between cells.



Operator adjustments to the measurements cause the white outline to be hidden to simplify measurements. The following graphic shows the gap measurement with and without the white outlines.



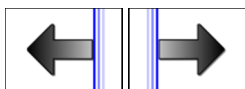
Gap measurement with white outlines



Gap measurement outlines hidden

IMPORTANT: The new VISTA software must know the screen and screen angle of the cell being measured. Measuring difficulties occur if you attempt to measure a cell that does not match the loaded screen/screen angle, often appearing as wild outlines that do not follow the cells.

Movement



Use the controls to manually move the active measuring lines in the arrow direction. As the lines move, the distance displays in the appropriate Measured Value field. The lines may or may not be visible depending on the condition, though the arrow keys will display.



The most common buttons are for moving the vertical lines left or right, as shown above. A second set of arrows for moving horizontal lines up or down are available for gap measurement.

Line Select



Only one line at a time can be moved. The active line is identified by the dark blue color. Toggle between active lines by touching the Line Select button.

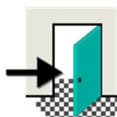
The button shown for Line Select changes depending on whether a cell/channel width is being measured (vertical lines) or a gap between cells (horizontal lines).

Alternative Methods for Moving Cursors

In addition to the buttons controlling the lines, you can also move the lines by:

- Tapping the screen to the left or right, or above or below, of the active cursor moves the cursor in that direction. Each tap moves the cursor one pixel.
- Dragging the line with your finger. Touch and hold the active cursor, then drag the active cursor to the required position.
- Touch and hold a location on the display to make the active cursor jump to the location. From there you can fine-tune the position by using the cursor controls or tapping the screen.

Exit



Leave the VISTA page by touching the Exit button. If cells have been measured, the machine prompts the operator with a selection window containing three exit options.



Approve and Exit – Exit and automatically enter the measured cell sizes in the Cell Setup page. These measured values are used for making adjustments to the next testcut.



Discard and Exit – Exit the VISTA page and discard the measurements.



Cancel Exit – Remain on the VISTA Cell Measure page.

Live Video Toggle



Touch this button to activate the camera and also switch between Live Video and Frozen modes. The background color changes between green (live video) and red (video is frozen).

Converge



Opens the Converge page where EasyCell and QuickCell can be started. See *Converge Page* on page 94 for additional information.

VISTA Calibration





Opens the VISTA Calibration page. See *VISTA Calibration Menu* on page 97 for additional information.

Perform Test Cuts



Touch this button to engrave a manual test cut. It is the same function as the Perform Test Cuts button on the Cell Setup page, but without jumping between pages.

Note: Confirm starting cylinder rotation by selecting  to start or  to cancel.

Subsequent test cuts can be made by again pressing the Perform Test Cuts button on this page after measuring the cells. Adjustments are made to the engrave head based on the measured values.

Midtone Testcut



Starts the manual Midtone testcut converge. This requires the operator to measure the cells made in the testcut.

For midtone as part of the EasyCell, QuickCell or Volume converge, see *Start Mid-tone – EasyCell or QuickCell* on page 94.

Save Image



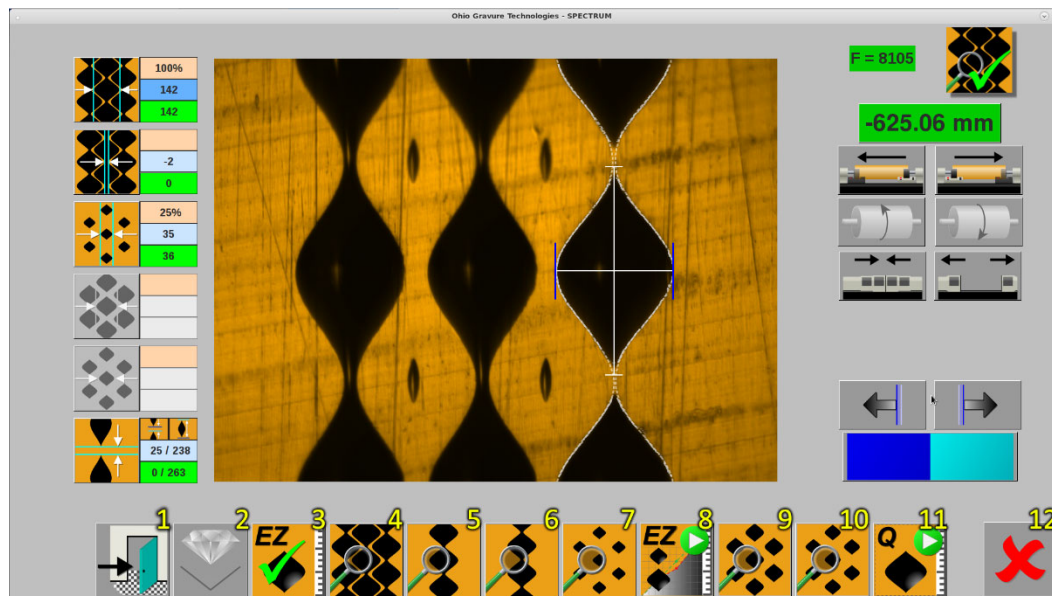
Saves the image, including the cell image, lines and cell measurements. These images can be downloaded using the OHIO Dashboard application (see Chapter 5).

Images stored using Save Image are identified as XXX_operator.jpg.

Converge Page



This icon opens the Converge page from the VISTA Cell Measure page.



- | | | |
|-----------------------------------|---|---------------------|
| 1 Exit | 5 View Stripe Full Cells | 9 View Mid-tone 1 |
| 2 <i>Unassigned</i> | 6 View Channel | 10 View Mid-tone 2 |
| 3 Start Converge (EasyCell shown) | 7 View Highlight Cells | 11 QuickCell Assist |
| 4 View Nested Full Cells | 8 Start Mid-tone Converge
(EasyCell shown) | 12 Cancel |

Note: Some buttons are grayed out; they are available at different points of operation or with different configurations.

Start Converge - EasyCell or QuickCell

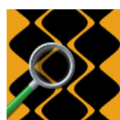


This icon starts the EasyCell Converge sequence. Cells are automatically measured by the Spectrum using EasyCell.



This icon start the QuickCell Converge sequence. QuickCell allows for operator assisted cell measurements.

View Nested Full



Use this icon to view the Nested Full cells.

- With EasyCell, it is used at the end of the converge sequence for reviewing the cells.
- With QuickCell, it is used during the converge sequence to view the nested cells. This gives the operator the chance to see the cell walls to determine copper quality, etc.

View Stripe Full



This icon is used to view the Stripe Full cells, where the cells do not have neighboring cells.

- With EasyCell, it is used at the end of the converge sequence to review the cells.
- With QuickCell, it is used during the converge sequence to view the cells and verify full cell size. This is the primary view used for measuring full cells.

View Channel



Use this icon to view the channel.

- With EasyCell, it is used at the end of the converge sequence to review the channel.
- With QuickCell, it is used during the converge sequence to view the channel verify channel size.

View Highlight



This icon is used to view the highlight cells.

- With EasyCell, it is used at the end of the converge sequence to review the cells.
- With QuickCell, it is used during the converge sequence to view the highlight cells and verify cell size.

Start Mid-tone – Can be either EasyCell or QuickCell

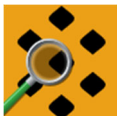


This icon starts the EasyCell Mid-Tone Converge sequence. Cells are automatically measured and adjusted by the Spectrum using EasyCell.



This icon starts the QuickCell Mid-Tone Converge sequence. QuickCell allows for operator assisted cell measurements.

View Light Mid-tone



Use this icon to view the Light Mid-tone cells.

- With EasyCell, it is used at the end of the converge sequence to review the cells.
- With QuickCell, it is used during the converge sequence to view the light mid-tone cells and verify cell size.

View Heavy Mid-tone



Use this icon to view the Heavy Mid-tone cells. It is only active with 4-point mid-tone.

- With EasyCell, it is used at the end of the converge sequence to review the cells.
- With QuickCell, it is used during the converge sequence to view the heavy mid-tone cells and verify cell size.

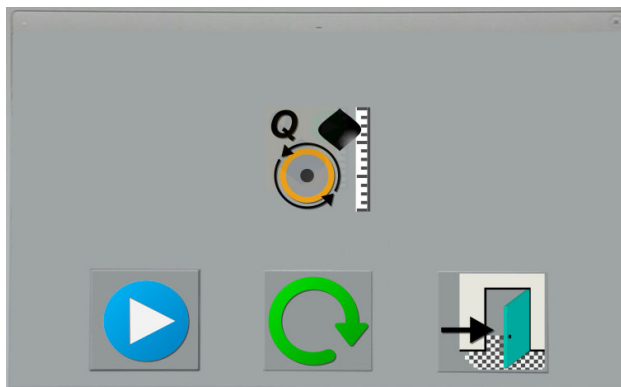
Change EasyCell Converge to QuickCell



This icon displays during the EasyCell Converge sequence, on the far right of the menu bar. Touching this button during the EasyCell Converge changes the converge routine to QuickCell, where the operator can assist with cell measuring. QuickCell remains the converge method until a new job is loaded on the Engrave page.

Restarting QuickCell

There may be instances where you restart QuickCell after achieving cell setup calibration. You can see when calibration is achieved by the green backgrounds in the Measured values of the VISTA page. When you restart the QuickCell Converge, a prompt window appears.



The Continue button resumes making QuickCell testcuts where you left off, with the cell sizes previously measured. The Light Calibration and Camera Focus routines are not repeated.



The Restart button goes back to the beginning of the QuickCell Converge, including Light Calibration and Camera Focusing. The measured cell sizes currently shown are discarded and a new testcut is made.



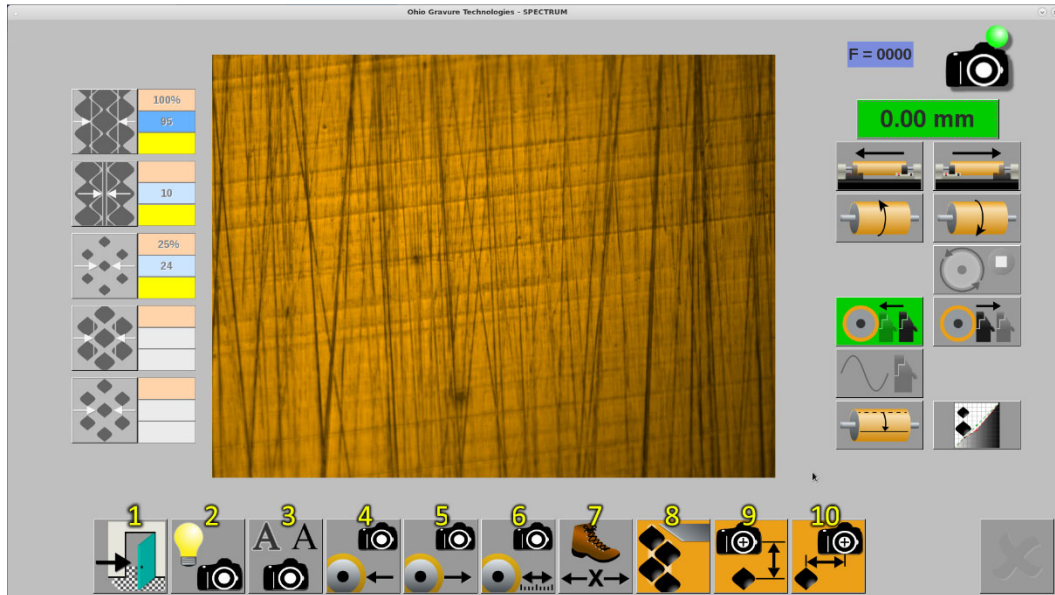
The Exit allows you to leave the prompt if you accidentally selected the QuickCell Converge button. QuickCell is not restarted and the cell sizes measured previously are used.

VISTA Calibration Menu



This icon opens the VISTA Calibration menu from the VISTA page. Use this menu to:

- Calibrate the VISTA camera
- Adjust the camera focus
- Move the shoe
- Calibrate the burr cutter



- | | | | |
|---|------------------------|----|-----------------------------|
| 1 | Exit | 6 | Focus Distance |
| 2 | Auto Light Calibration | 7 | Shoe Move |
| 3 | Auto Focus | 8 | Burr Cutter Alignment Menu |
| 4 | Manual Focus In | 9 | Camera Vertical Alignment |
| 5 | Manual Focus Out | 10 | Camera Horizontal Alignment |

Light Calibration



Touch to calibrate the light source of the VISTA camera.

Note: The camera field-of-view must be clear of all cells when performing a Light Calibration. Visible cells create a bad light calibration and may affect performance.

Auto Focus



Touch to perform an automatic focus of the VISTA camera.

Manual Focus In



Use to manually focus the VISTA camera by MOVING IT TOWARDS the cylinder. The camera moves a set distance, defined by Focus Distance, each time you press the button.

Note: Only active with the engrave head against the cylinder.

Manual Focus Out



Use to manually focus the VISTA camera by MOVING IT AWAY from the cylinder. The camera moves a set distance, defined by Focus Distance, each time you press the button.

Note: Only active with the engrave head against the cylinder.

Focus Distance



Sets the distance the camera moves when the Manual Focus In/Out buttons are pressed. Enter a number from 1 to 1000 steps. This distance is used until a new number is entered. A value of 25 is useful when making small focus adjustments, 100 for larger adjustments.

Shoe Move



Moves the shoe towards or away from the cylinder to change cell size. Press the Shoe Move button to open a keypad and enter a value from -50 to +50. This number relates to the cell size in microns. Entering -25 reduces all features – full and highlight cells, and channel – by 25 microns. Entering 40 increases all features by 40 microns.

Note: A shoe move is only performed with the engrave head off the cylinder. The machine automatically raises the head, if lowered, before moving the shoe. Changes to the shoe position may require re-focusing the camera, either manually or using Auto-Focus.

Burr Cutter



Touch the Burr Cutter button to open the Burr Cutter Alignment menu. See *Burr Cutter Alignment Menu* on page 99.

Camera Vertical Position



Use this to set the camera position over the cells in the test cut. For further information on this function, please refer to Chapter 5, *Aligning and Calibrating the VISTA System Camera*.

Camera Horizontal Position



Use to mechanically align the camera over the last row of cells in the test cut. For further information, please refer to Chapter 5, *Aligning and Calibrating the VISTA System Camera*.

Burr Cutter Alignment Menu

Use this page to align the burr cutter over the stylus. Proper alignment ensures optimal removal of burrs. Once aligned, the machine automatically positions the burr cutter based on the cylinder circumference.



To open the Burr Cutter Alignment menu, touch this button on the VISTA Calibration page.

Move Burr Cutter



Use the Move Burr Cutter button to cycle the burr cutter to the defined Burr Cutter Offset. When pressed, the burr cutter arm moves left to a reference point, then reverses and moves to the offset value.

Note: A burr cutter move can only be performed with the engrave head off the cylinder. The machine automatically raises the head, if lowered, before moving the burr cutter.

Burr Cutter Offset



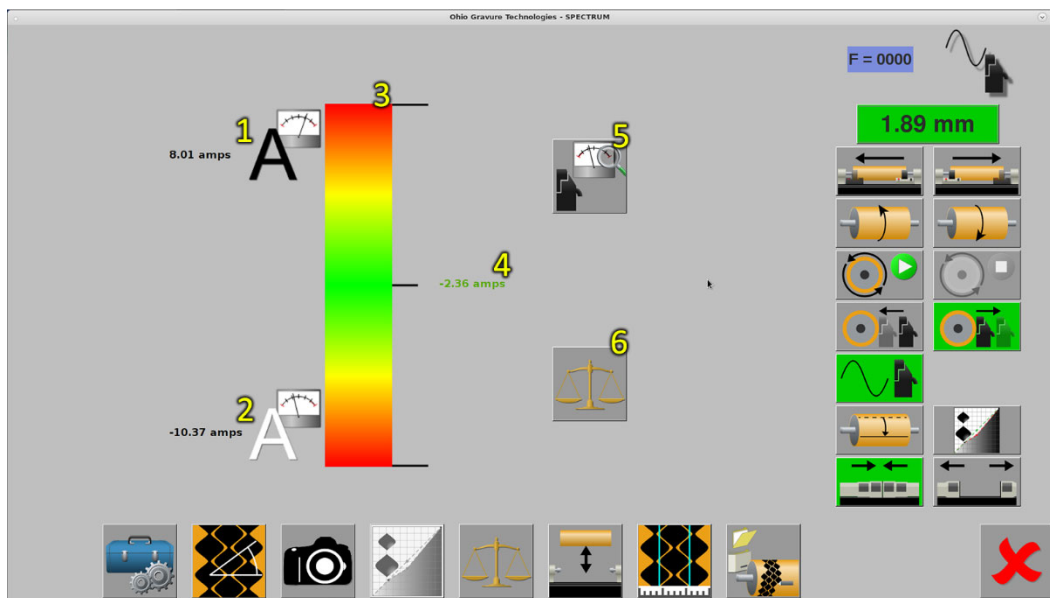
Use to enter the offset distance required to position the burr cutter over the stylus. Press the button to open a keypad and enter a value between -1000 and +1000. See *Burr Cutter Alignment* in section 4 for instructions on positioning the burr cutter.

Measure Currents Page



Touch this button to open the Measure Currents page. Use this page to:

- Measure the engrave head currents
- Balance the head currents



- | | |
|-----------------|--------------------------|
| 1 Black Current | 4 Difference of Currents |
| 2 White Current | 5 Read Currents |
| 3 Current Scale | 6 Balance Currents |

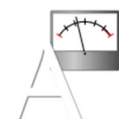
Measuring and balancing the engrave head currents is important. The Spectrum automatically measures and sets current balance to zero before starting the QuickCell and EasyCell converge routines. After achieving the required cell sizes, the Spectrum measures currents to determine if they are within acceptable balance. The setup routines *will not allow the Spectrum to run currents out of balance.*

Black Current



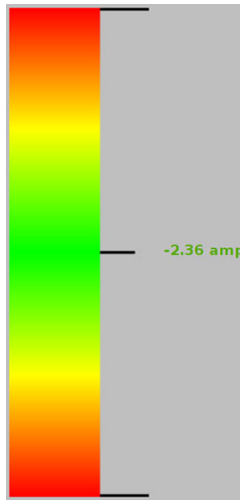
Displays the black current value. This is the maximum positive (+) current being used.

White Current



Displays the white current value. This is the maximum negative (-) current being used.

Current Scale



Displays the difference in currents between the Black and White currents.

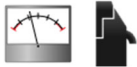
The maximum allowable difference between currents varies depending on the speed. The Spectrum automatically balances the currents and repositions the sliding shoe if the current imbalance exceeds the recommended amount for the speed.

For instance

Current imbalance for cutting at 8100 Hz is +/- 3.5 Amps.

Current imbalance for cutting at 1700 Hz is +/- 1 Amp.

Read Currents



Touch this button to measure engrave head currents. The machine displays the results beside the Black current and White current icons on this page. The difference between the currents is also displayed using the current scale.

The Read Currents button is only active when the AC/Vacuum is turned on.

Balance Currents



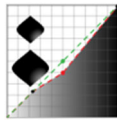
Balance the engrave head currents by touching this button. The machine centers the engraving currents around zero. If the engraving currents measure +3 and -7 Amps, the new currents after balancing are +5 and -5.

Note: Balancing the engrave head currents requires a shoe adjustment to achieve the same cell sizes. You should check cell setup again if you balance currents after testcut setup.

Current balance is automatically checked when starting an EasyCell, QuickCell, or Volume Converge and again after the required cell sizes are achieved. If balancing is required, the machine moves the shoe to maintain current symmetry and then repeats test cuts to verify cell sizes.

CAUTION: The current balance must be kept very close when using a 130 μ m High Output engrave head or 130 μ m Hybrid engrave head. Currents must not be more than +/- 1 amp out of balance. It is important to use the shoe position to keep the currents balanced with this engrave head.

Mid-Tone Correction Page

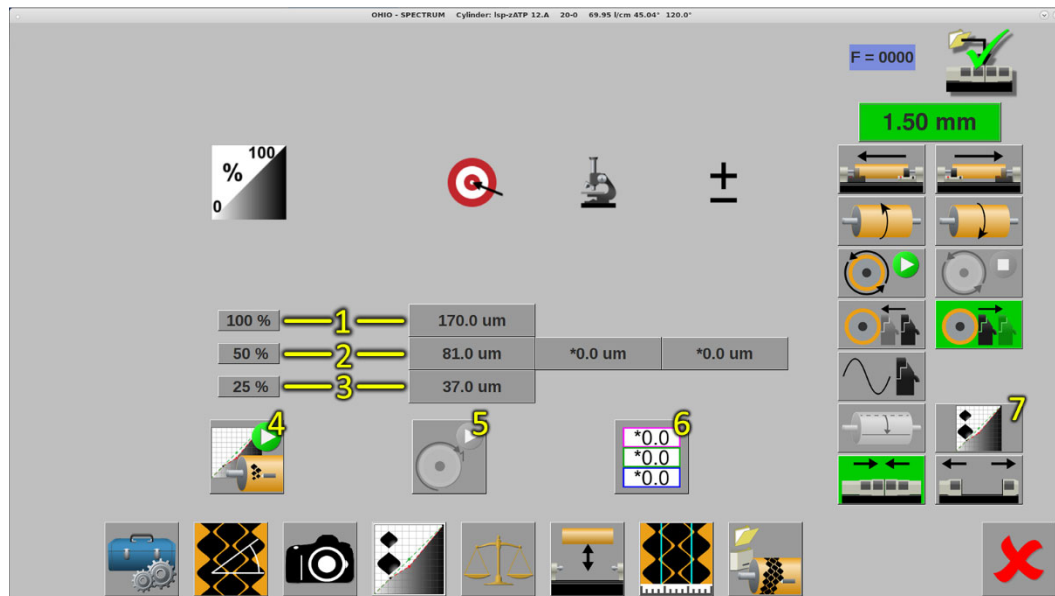


Touch this button to open the Mid Tone page.

Note: The Mid-Tone button is disabled when no job is selected, when measuring or balancing currents, or when cell depth is exceeded.

Every engrave head is slightly different. Two heads set to the same highlight and full cell sizes may have small differences in the mid-tone values. Mid-tone correction eliminates the difference, improving results between machines and allowing cylinder re-makes to be machine independent.

Note: Ohio GT encourages the use of Mid-Tone Correction function. This function improves repeatability between cylinder remakes with little slow-down in the production cycle.



- | | |
|-----------------------------|--------------------------|
| 1 Full Cell Values | 5 Find Start |
| 2 Mid-Tone Values | 6 Clear Displayed Values |
| 3 Highlight Cell Values | 7 Mid-Tone Enabled |
| 4 Perform Mid-Tone Test Cut | |

Mid-Tone Correction page showing 3-point correction curve.

The Mid-Tone Correction can use a 3-point or a 4-point curve, based on the Collage job setup.

Test Block Values

The test block values show the percentages engraved in the mid-tone blocks. The top and bottom entries match the values of the test cut from the Cell Setup page. The middle entries are the mid-tone values. These can be varied in the Collage job.

Target Values



The Target Value shows the mid-tone cell size goal(s). The full and highlight values are shown for reference only. The mid-tone values are set in the Collage job or calculated automatically from the sizes in the Cell Setup page.

Measured Values



This icon identifies the Measured Values, determined using the VISTA microscope or an external video-microscope.

The difference between the target values and measured values are calculated and displayed in the Change Values column. The Spectrum will use the Change Values to adjust the engrave head controls to achieve the target values when the next test cut is made.

Note: The Full and Highlight values cannot be changed. The values are based on the final test cut values.

Change Values





This icon identifies the Change Values, to increase or decrease the measured cell size to achieve the target.

Perform Test Cuts



Touch this button to engrave a mid-tone test block. The machine starts cylinder rotations, the engrave head moves against the cylinder and cuts a mid-tone test block set. The cylinder then stops and the test cut is positioned under the VISTA camera.

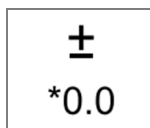
Note: Confirm starting cylinder rotation by selecting  to start or  to cancel.

Find Test Cut



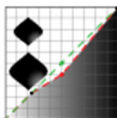
Use this button to rotate the cylinder and place the test cut in front of the VISTA camera.

Clear Displayed Values



Touch this button to clear the measurements in the Change Values column. All Change Values entries return to *0.0 um.

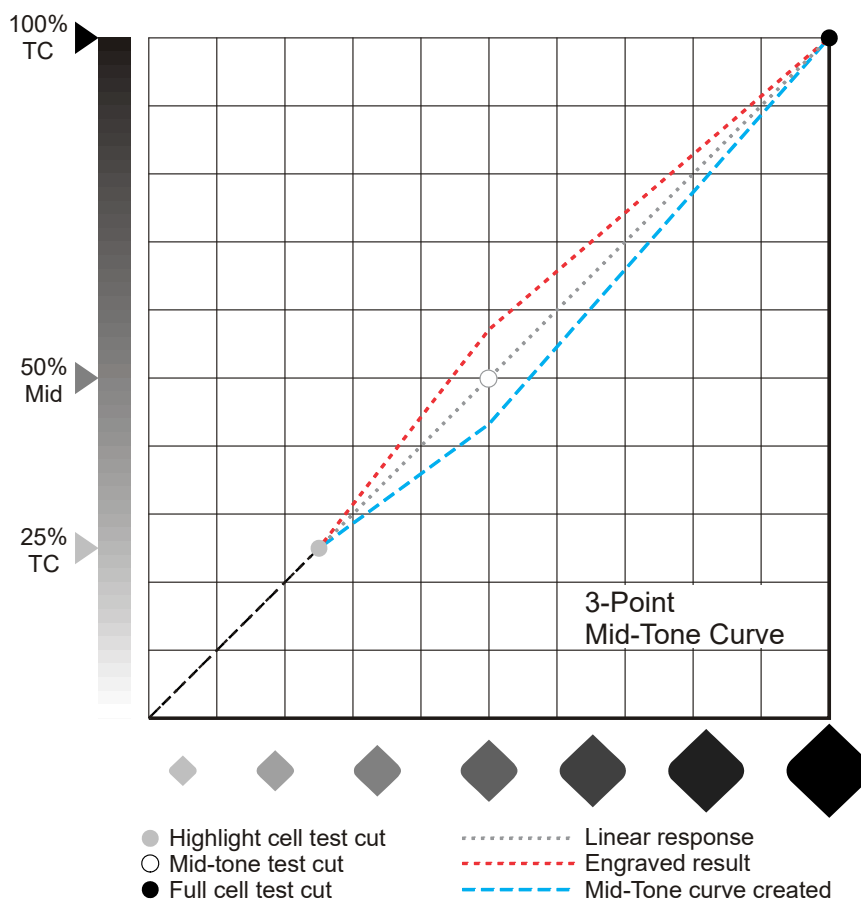
Mid-Tone Enabled



The Mid-Tone Enabled button is found in the column of buttons on the right side of the display. This button is activated automatically.

The Mid-Tone Correction page is very similar to making test cuts on the Cell Setup page. The Mid-Tone Correction page adds one or two additional tone blocks to the test cuts for measurement. Measure and enter the cell sizes to create a correction curve to linearize the engrave head. See the following examples for an overview of *3-point* and *4-point* correction curves.

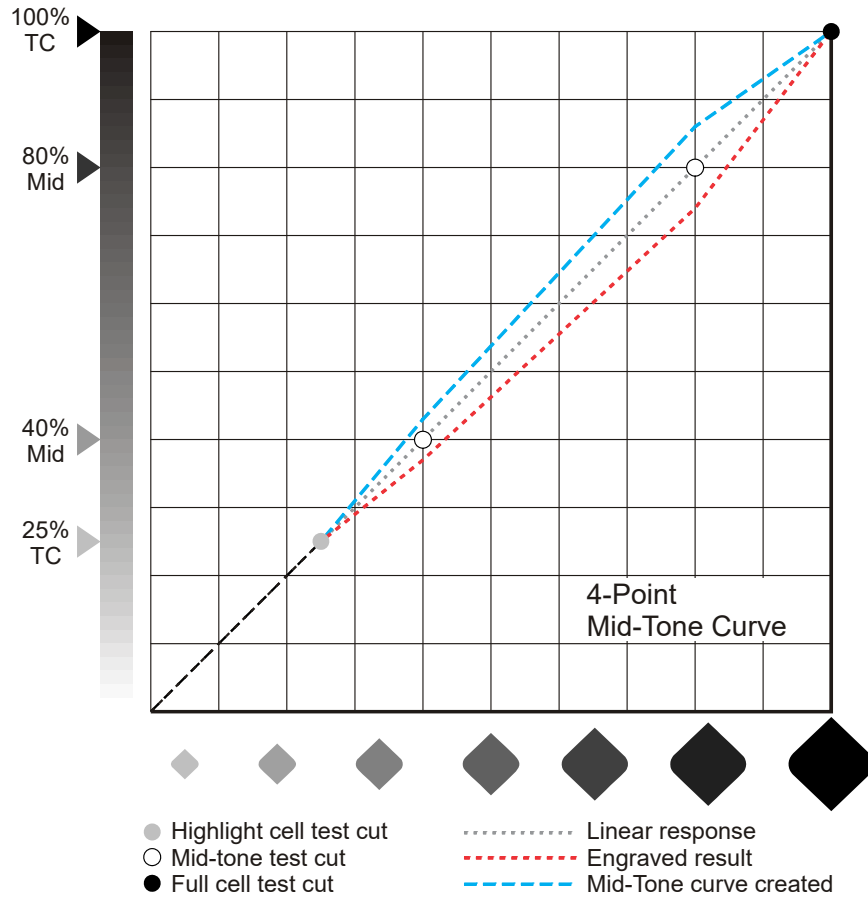
3-Point Curve Example



In the 3-point example, one extra test block is engraved at 50% (a user-definable value). The engraved cell is larger than the expected result. Enter the engraved cell size in the Mid-Tone Correction page to create a correction curve. In this case, the correction curve decreases the cell size.

Note: OHIO encourages using a value that evenly falls between the highlight and full cell percentages. If you use 25% and 100% for the highlight and full cells, then a mid-tone value of 62.5% is correct.

4-Point Curve Example



In the 4-point example, two extra test blocks are engraved at 40% and 80% (user-definable values). The engraved cells are smaller than the expected result. Enter the engraved cell sizes in the Mid-Tone Correction page to create a correction curve. In this case, the correction curve increases the cell sizes.

Note: OHIO encourages using values that evenly balance between the highlight and full cell percentages. If you use 25% and 100% for the highlight and full cells, then the two additional mid-tone values would be 50% and 75% .

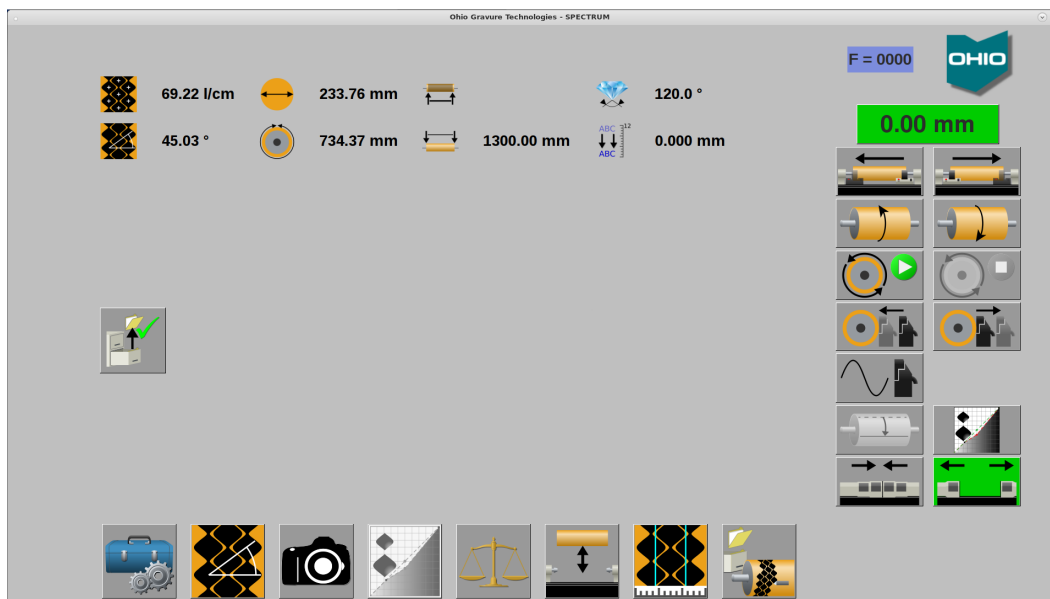
Note: Four-point mid-tone can only be performed when set by the Collage layout. Standard mid-tone operation is three-point.

Engrave Page



Touch this button to open the Engrave page. Use the Engrave page to:

- Download jobs for engraving
- Start and stop engraving jobs
- View engraving in-process

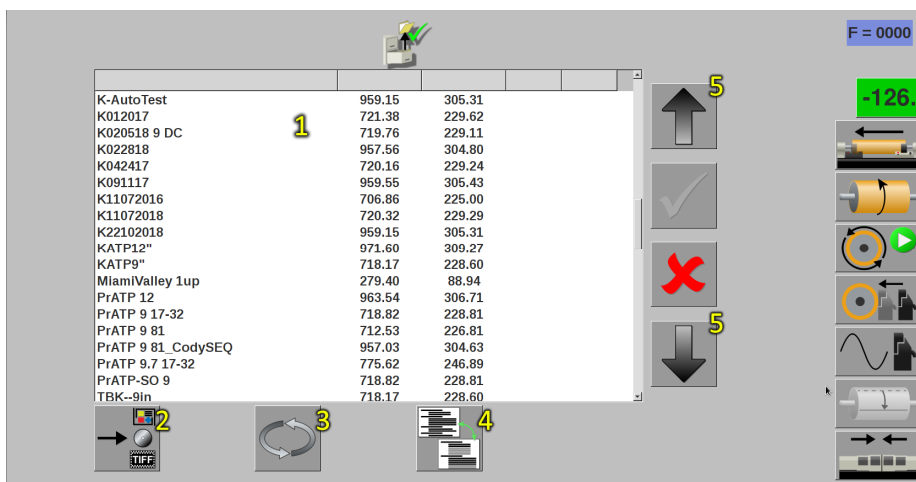


Load Job



Touch this button to choose a job for engraving.

The window displays a list of jobs available for engraving.

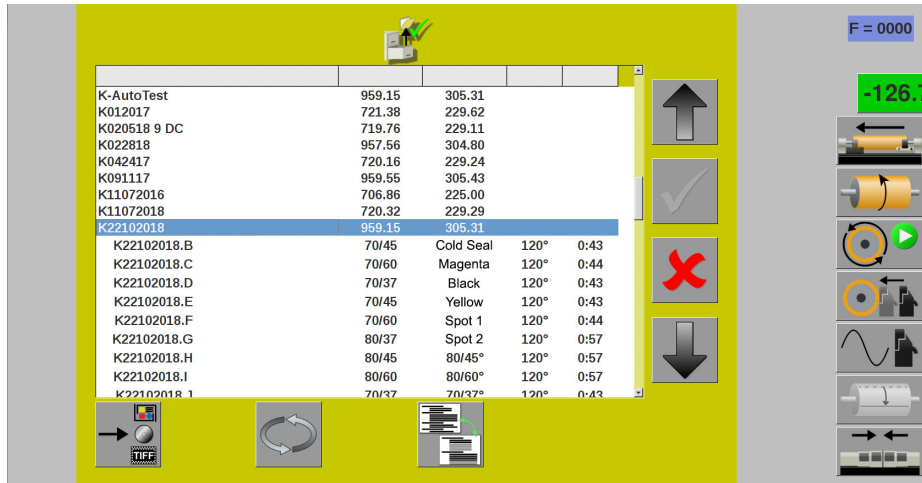


- 1 Job List
- 2 Select Source
- 3 Refresh Job List
- 4 Job List Toggle
- 5 Scroll Job List Up/Down

The job list displays folder names reflecting the Job ID entered in Collage, normally a docket/ticket number used to track work. Inside each folder are the cylinders pertaining to the job. Touch a job name to open the folder and show the cylinders and engraving information: cylinder name, screen and screen angle, color, engraving stylus and engraving time.

Note: The Cylinder ID shown is the Separation ID on the Gravure Parameters window in Collage.

Touch the job name of another folder to see cylinders in another folder.



The folder names are shown in either black or grey text.

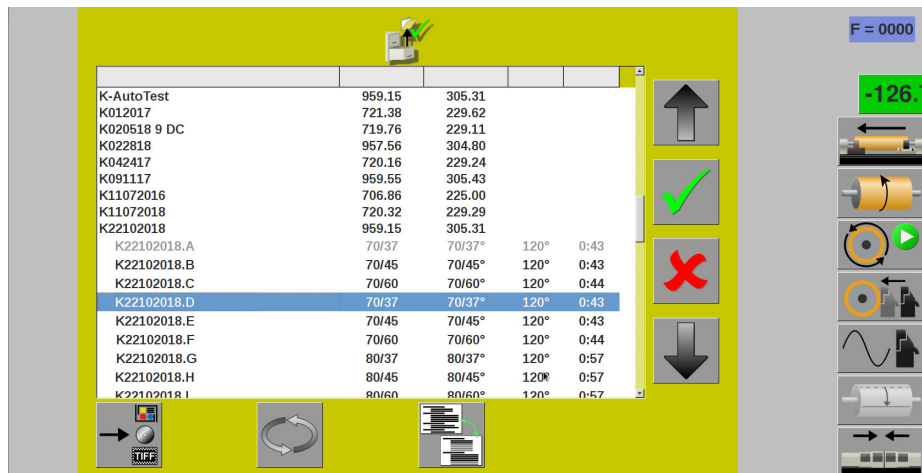
- Black text indicates cylinders in the job still need to be engraved.
- Grey text indicates all cylinders in the job have been engraved.

By default, only jobs with cylinders still to be engraved are shown (black text) when the list is opened. This simplifies finding jobs with cylinders yet to be cut. Likewise, only cylinders to be engraved show when a folder is opened, reducing clutter and simplifying finding cylinders still to be engraved.

Toggle Job List



Press this button to display all jobs and cylinders, even those that have been engraved. Job and cylinder names shown in grey indicate the cylinder has already been engraved. Press the button a second time and show only jobs and cylinders that still must be cut.



Cylinders that are part of a sequenced group, also called over-engraving, are identified by a number in parenthesis. In the following graphic the first cylinder in the selected job has (2) behind the name. This indicates a sequenced group with two engraving passes being made on one cylinder. This permits multiple screens/images on one cylinder in registration with each other. This is often used on black/key cylinders where one screen is used for the linework for text clarity and a second screen used for the process image to avoid moiré.


K091117	959.55	305.43			
K11072016	706.86	225.00			
K11072018	720.32	229.29			
K11122018	712.53	226.81			
PrATP 9 81.A (2)	60/38	60/37°	120°	0:01	
└PrATP 9 81.B	70/30	69/30°	120°	0:02	
PrATP 9 81.C	70/34	69/33°	120°	0:02	
PrATP 9 81.D	70/45	69/44°	120°	0:02	
PrATP 9 81.E	70/60	69/60°	120°	0:02	
K22102018	959.15	305.31			
KATP12"	971.60	309.27			
KATP9"	718.17	228.60			


As part of the sequence group, the second cylinder in the sequence is shown with a "L" symbol left of the name, showing the connection between the first and second cylinder. The "L" symbol will appear beside all cylinders that are part of the sequence group.


Sequenced engraving sets are created in the Collage system. Please see the Collage online help on the Collage workstation or on the OHIO website, www.ohiogt.com

Note: Spectrum machines in full-automation – A Spectrum in an automated line with Gravostar HS machines cannot use Collage to setup sequence engraving. In this situation the AutoCon system must perform sequence. A Configuration item informs the Spectrum of the Sequence Source: Configuration > Automation > Automation Sequence Source > AutoCon

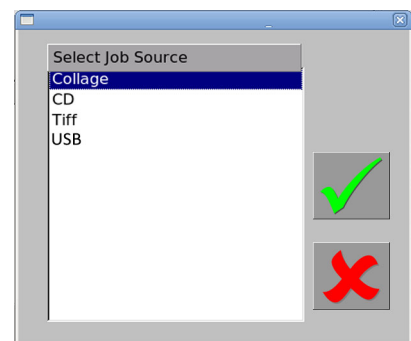
Select Source

 Touch the icon to open the Select Job Source window and choose where the machine

 looks for jobs. The default job source is the Collage system. The Spectrum is capable of

 receiving engraving jobs from different sources including:

- CD and DVD – Read Collage jobs using the D/DVD drive of the embedded PC.
- TIFF – A legacy function that is rarely used.
- USB/Flash Drive – Read Collage jobs from USB/Flash drives. Be patient, it takes a few moments for the USB drive to be recognized before the selection appears. If it does not show, close the Select Job Source window then re-open it.



Refresh



Press the Refresh button to update the job list with new jobs set Ready for Print. The job list is refreshed each time you open the job listing page.

Job Successfully Loaded

A blue background indicates the job has downloaded properly, with all job parameters set on the machine. Job information and additional icons display with the successful download.



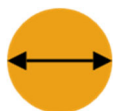
- | | |
|---|--|
| 1 Cylinder Name (in title bar) and Cylinder Information | 4 Engrave Start |
| 2 Close Job | 5 Run Semi-Automation (conditional) |
| 3 Job Preview | 5 Start EasyCell or QuickCell Converge (conditional) |

Not shown is the Job Notes button.

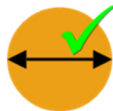
Cylinder Information

Information on the loaded job shows in the group of icons at the top of the page. Most of the icons are static, but several can change because of verification steps: Cylinder Diameter/Circumference and Cylinder Length.

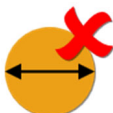
Cylinder Diameter



This is the icon showing the cylinder diameter of the loaded job. If the Spectrum is equipped with Diameter Verification, this icon changes to reflect if the diameter matches the diameter of the cylinder in the machine.



The verified icon with a green checkmark displays if the cylinder in the machine matches the diameter of the loaded job. This icon only displays if the optional Diameter Verification is installed and the cylinder has been verified.



The error icon with a red X displays if the cylinder in the machine does not match the diameter of the loaded job. The machine also flashes the light on the monitor tower and shows a status icon with error 36.

Cylinder Circumference



This is the icon showing the cylinder circumference of the loaded job.



The verified icon with a green checkmark displays if the cylinder in the machine matches the circumference of the loaded job. This icon only displays if the optional Diameter Verification is installed and the cylinder has been verified.



The error icon with a red X displays if the cylinder in the machine does not match the circumference of the loaded job. The machine also flashes the light on the monitor tower and shows a status icon with error 36.

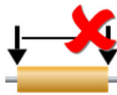
Cylinder Face Length



This is the normal icon and it displays the face length for the loaded job. This value is different than the engraving width. The cylinder face length must be larger than the engraving width.



The verified icon with a green checkmark displays if the face length of the cylinder in the machine matches the loaded job. This icon only displays if End-Seeking Sensors are installed and semi-automated engraving is active. End-seeking sensors were optional on early machines and are now standard equipment on Spectrum engravers.



This icon with a red X displays if the measured face length is not correct for the loaded job. The machine also flashes the light on the monitor tower and shows a status icon with error 16.

Close Job



This button displays when a job is loaded.

Touch the Close Job button to clear the currently loaded job from the engraver after the cylinder has been engraved. Use this button also if the wrong job has been downloaded. The background of the Engrave page is grey when no job is selected.

Preview Cylinder



Use the Preview Cylinder button to view the loaded job. Touch this button to display the cylinder layout and image data for verification before engraving.

Note: Preview Cylinder must be closed before engraving or performing any machine function.

Job Notes



The Notes button displays information about the job/cylinders. This information is entered by the Collage operator.

Note: This button only appears when information is available in the job.

Testcut – EasyCell or QuickCell

Note: This button only shows when Automation is set to Engrave-Automation. You can find this at Configuration>Automation>Engrave-Automation.



Touch to begin the test cut sequence using either the:

- EasyCell converge – Labeled with EZ.
- QuickCell converge – Labeled with Q.



The test cut is performed, including Tip Cal if necessary, and when cell sizes are achieved, engraving begins.

Run Semi-Automation

Note: This button only shows when Automation is set to Semi-Automation. You can find this at Configuration>Automation>Semi-Automation.



Touch this button to begin the semi-automated sequence. The sequence includes:

- Loading the cylinder (operator performed)
- Verifying cylinder face length and positioning the engrave head for testcuts
- Performing test cuts (EasyCell or QuickCell)
- Starting the engraving

The Spectrum automatically begins engraving the job when the cell setup completes using QuickCell or EasyCell routines. The Engrave page is automatically shown and the Engrave Start is initiated. The job continues until finished.

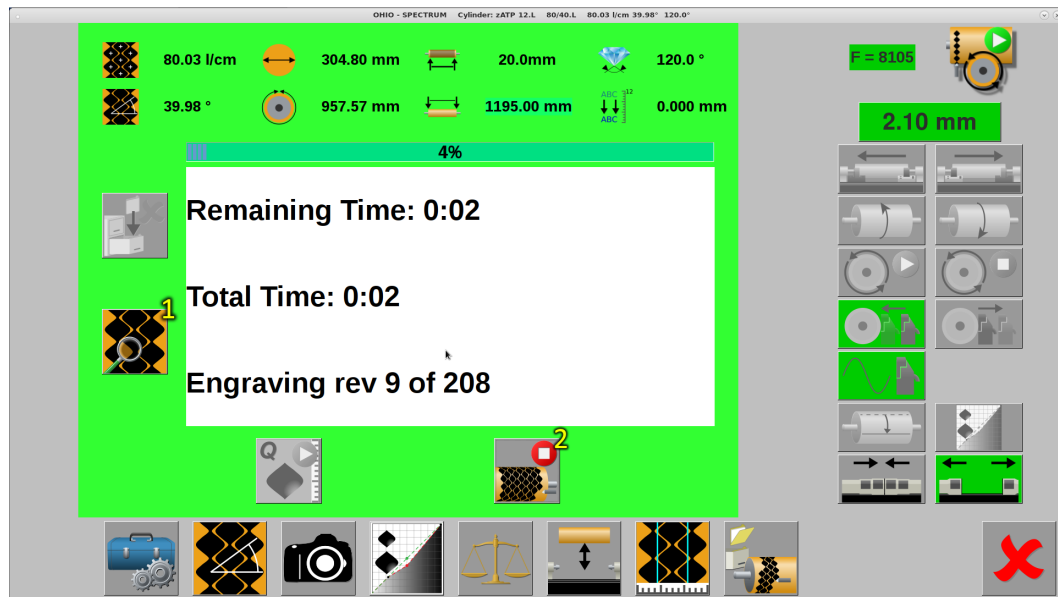
Engrave Start



Touch this button to start engraving the loaded job.

When using QuickCell or EasyCell routines, the Spectrum automatically begins engraving the job upon completion of the cell setup.

During engraving, the screen changes to green to indicate engraving is active. The Engrave Start button toggles to the Engrave Stop button.

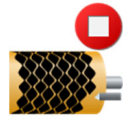


Green screen indicates engraving is active.

- 1 Real-Time Video
- 2 Engrave Stop

Once engraving, a variety of status information is displayed to keep you informed of the progress. See *Engraving Status* on page 113. If a problem develops during engraving, the screen changes to red.

Engrave Stop



Touch this button to stop engraving the current cylinder.

CAUTION: Do not stop engraving unless there is a problem with the cylinder or machine. Engraving cannot be resumed from the stopping point.

When not engraving, this button toggles to the Start Engrave button.

Sequence Engraving (Over-Engraving)

The Spectrum can engrave two or more engraving passes on the same cylinder automatically. Normal use involves two images printing the same color but using different engraving screens/angles. Black/key cylinders are the most common for sequenced engraving, where one screen is used for the linework and a second screen for the process work. This allows screens to be optimized for the best results – the process screen to prevent moire, the linework screen to produce excellent linework.

When using sequenced engraving, the machine remembers all positional data so that both engraving passes are in perfect register with each other.

Sequence engraving is available in both full-automation and semi-automation modes. Information on Sequence can be found in Collage on-line help or on the OHIO GT website at:

<https://www.ohiogt.com/support/service.html>

Note: Spectrum machines in full-automation – A Spectrum in an automated line with Gravostar HS machines cannot use Collage to setup sequence engraving. In this situation the AutoCon system must perform sequence. A Configuration item informs the Spectrum of the Sequence Source: Configuration > Automation > Automation Sequence Source > AutoCon

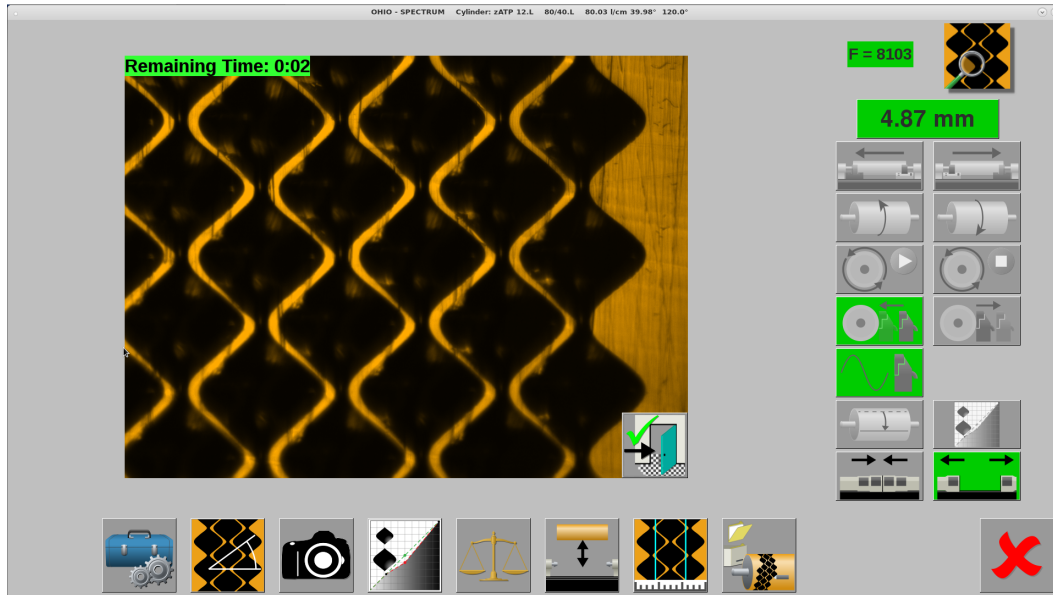
Real-Time Video



Touch this button to enable a live look to allow the operator to evaluate cell and copper quality during engraving as well as any stylus damage.

The Real-Time Video button is only available during engraving. This function provides a way to inspect the cells without pausing the engraving.

The Real-Time Video window



- 1 Exit Real-Time Video

Cell images are captured continuously for you to view. Full cells are the primary target, though smaller cells are also captured for viewing. Engraving time is displayed in the top of the display.

Note: The operator cannot make cell measurements during engraving with Real-Time Video.

Engraving Status

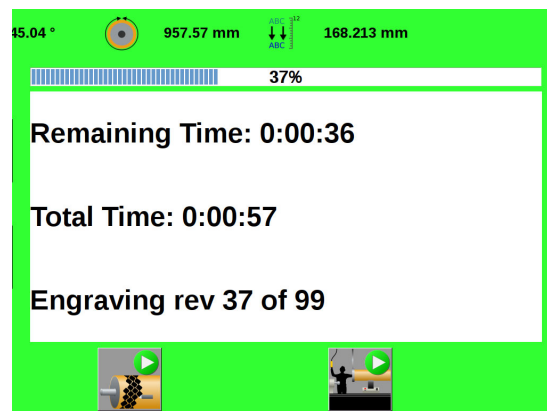
Status information is shown while engraving and includes:

Progress Bar – In a glance see how far engraving has advanced.

Remaining Time – The time to completion.

Total Time – The expected total time to engrave the job.

Engraving Rev – The current rev being engraved and the total revs in the job.



Log Page



Touch this button to open the Log file for the Spectrum engraver. This log file shows the button commands of the operator and the various machine actions taken in response to the commands. The log file is an excellent starting point to troubleshoot displayed errors.

Learn Table / Stylus Life Page



Touch this button to open the Learn Table page. The list box shows all screens that have been 'learned' by the engraver.



If Stylus Life Tracking is enabled, this icon displays instead, showing a hat and diamond. Touch this button first, followed by the hat button, to open the Learn Table.

Learn Table

A screen is learned when the test cut settings –screen, screen angle, and stylus angle – are saved into the Spectrum's Learn Table (memory). Saving this information is automatically performed after completing automated test cuts. The test cut settings are recalled and used for subsequent jobs with the same screen/stylus angle values. This greatly reduces engrave setup time.

Screen Angle	Cell Size	Black	AC	Filter	Style	Coefficient	Imbalance
100,40,110	106,11,23	1.23	1.00	XCoarse	Hybrid	-17,-39,-9	-0.02
100,50,120	93,9,20	1.09	1.04	Fine	AC	10,6,3	0.77
41,60,120	239,0,51	0.99	1.01	Coarse	AC	-17,-20,-14	0.00
43,60,120	227,0,49	0.98	1.01	Coarse	AC	0,-2,3	0.11
50,34,140	258,38,64	1.27	1.28	Fine	AC	67,6,14	0.02
50,45,120	230,23,57	0.97	1.01	Coarse	AC	-2,-5,1	-0.28
57,34,120	234,35,50	1.01	1.05	Coarse	AC	4,-5,1	-0.35
59,37,120	210,21,52	0.99	1.02	Fine	AC	-3,-8,-2	-1.27
59,44,120	196,19,49	0.96	0.98	Fine	AC	-10,-8,-5	-1.12
59,44,120	196,20,48	0.93	1.00	XCoarse	Hybrid	-5,6,32	1.26
59,59,120	164,0,41	0.94	1.00	XCoarse	Hybrid	-2,7,36	1.34
59,59,120	164,0,41	0.96	0.98	Fine	AC	-20,-16,-15	-3.05
60,30,120	223,33,55	1.03	1.07	Coarse	AC	34,21,28	0.13
60,45,130	192,20,47	1.03	1.04	Fine	AC	4,-1,0	-0.13
69,29,120	190,30,47	1.05	1.09	Fine	AC	4,-10,-2	-1.47
69,29,120	192,30,47	0.99	1.00	XCoarse	Hybrid	3,4,25	1.05
69,33,120	184,27,46	1.00	1.06	Fine	AC	-4,-13,-4	-1.89
69,60,120	140,0,35	0.97	0.99	Fine	AC	-19,-19,-16	-3.33
69,60,120	140,0,35	0.99	1.00	XCoarse	Hybrid	0,2,32	0.43
70,34,120	184,27,46	0.96	1.00	XCoarse	Hybrid	3,9,27	2.41
70,45,120	164,17,41	0.98	0.99	Fine	AC	2,4,2	-0.11
70,45,120	166,17,41	0.98	1.00	XCoarse	Hybrid	0,3,27	0.88
70,60,120	136,0,28	1.01	0.98	Fine	AC	-10,-8,-12	-2.22
79,39,120	154,15,38	1.00	1.04	Fine	AC	-2,-8,-2	-1.18

Scrn Angle Displays the engraving screen, screen angle, and stylus angle saved.

Cell Size The cell sizes – full, channel and highlight – associated with the Scrn Angle entry.

Black

AC

Filter

Parameters used to control the machine for the Scrn Angle entry. These values setup the control signals to the engrave head.

Style

Coef

Imbalance

Erase Functions

There are two erase functions on the Learn Table page. Erasing learn table entries for a screen will slow down the setup time of the machine. Both should be used with caution.



Erase One Entry – Use to delete one entry from the Learn Table.

To use:

- 1) Select the entry to remove.
- 2) Press the Erase One Entry button.



Erase All Entries – Use to delete all entries from the Learn Table.

CAUTION: Only use this function as a last resort or when instructed by an Ohio GT Service Representative.

Stylus Life Table



Touch the Learn/Stylus button followed by the Diamond/Clock button to open the Stylus Life Table.

The Spectrum has the ability to track the amount of time a stylus is used for engraving. This time is actual cutting time, allowing users to monitor stylus life and determine the average life of a cutting tool.

Stylus Angle	Serial Number	Time (hour:min:sec)	Selected
110	70109	65:31:14	
120	5163	202:29:07	
120	5164	198:20:07	YES
120	82296	62:15:24	
120	82297	00:38:19	
125	95120	139:12:09	
125	95121	24:15:34	
130	20946	239:01:10	
130	20947	75:46:00	
130	20948	00:45:52	
140	8197	209:54:37	
140	8201	82:57:04	

To use, the Stylus Life Table option must be enabled. Turn ON the function at Configuration>General>Stylus Life Table. When active, the Learn Table button shows the Hat and Diamond icons. Also, when activated, the Spectrum prompts the user to select the stylus being installed with each stylus change.

Information Table

The Information table shows data about the styli being used on the engravers. Stylus angle, stylus serial number and the accumulated engrave time for the stylus are shown. The stylus currently installed in the engraver is also indicated.

Selecting a Stylus for Tracking



A stylus must be selected from the table in order to track the time for the tool. The stylus currently being tracked will have YES displayed in the Selected column of the table.

To select a stylus already in the table – Touch the correct stylus from the list and press the OK button.

If the stylus is not in the table, you must first add the stylus to the table and then select it.

Adding a Stylus to the Table



Add a new stylus to the list by pressing this button. Follow the steps to enter the diamond angle and serial number. The stylus is then added to the table.

Removing a Stylus from the Table

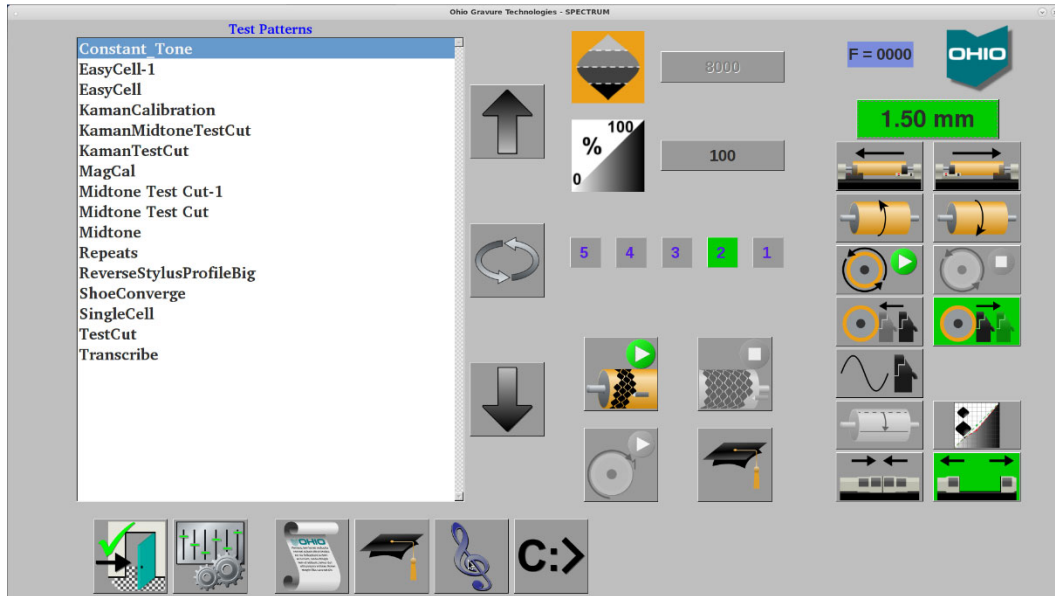


Use to remove styli sent for re-lapping or perished styli. Touch the appropriate stylus serial number then press this button to delete the stylus.

Tune Page



Touch this button to open the Tune page. This page contains various test jobs used during engrave head tuning. Some of these jobs may be of value to the machine operator, like the Constant Tone job for engraving coating or anilox cylinders.



An additional function this page provides is the ability to see what tune is being used for the engrave head. A series of numbers and a green background identifies the active tune. Most Spectrum engravers have three (3) tunes. Spectrum engravers with a digital P-Card may have additional optional tunes installed like Hybrid or Transcribe that can bring the maximum tunes to five (5).

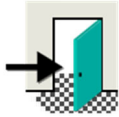
Exit Software



Touch this button to display various embedded computer options.

CAUTION: DO NOT use any of these functions except CANCEL while engraving. All engraving processes immediately terminate, ruining the cylinder and possibly damaging the engraving stylus.

The options include:



1 - Exit – Quits the Spectrum application software and returns to the basic desktop and icons.



2 - Restart – Quits the Spectrum application software and reboots the computer.



3 - Shutdown – Quits the Spectrum application software and the Linux operating system. Once the OS stops, the PC turns OFF.



4 - Cancel – Returns to the Spectrum application software.

Note: Turn OFF the engraver by pressing one of the red Emergency Stop pushbuttons on the Spectrum.

Engrave Head Operation

Overview

The engrave head is the output device on the engraver; image data is translated into stylus movement at the head. The stylus movement produces an engraved image by cutting cells into the cylinder surface.

The engrave head is mounted on the engrave carriage, and compensates for different cylinder diameters by moving forward or backward as needed.

A vacuum pump and chip collection bag are located on the back of the engraver. The vacuum system removes the chips created during engraving and cools the engrave head.

Engrave Head Diamonds

The following diamonds are located on the face (cylinder side) of the engrave head:

Sliding Shoe

Cartridge Shoe – OGT part number 320082-05



The sliding shoe is a reference diamond, ensuring proper distance between the stylus and cylinder surface. It rides against the cylinder. The shoe tracks the cylinder surface, adjusting the position of the head to compensate for cylinder run-out.

Moving the shoe changes the cell and channel size equally.

A single screw holds the sliding shoe to the engrave head. The shoe cartridge is keyed to simplify installation.

Sliding Shoe Installation and Replacement

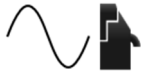
The life expectancy of the shoe diamond depends on the range of cylinder circumferences you use. Engraving a wide range of circumferences increases the life of the shoe.

Unusual wear on the cylinder, such as scratching or grooving, indicates that the shoe should be replaced. At a minimum, replace the shoe at least once a year.

To replace the shoe:



1. Touch the Head Out button to retract the engrave head.



2. Turn OFF the AC/Vacuum button.
3. Locate the socket head cap screw securing the shoe to the shoe block. This screw is on the front of the shoe (the side facing the gravure cylinder).
4. Using a $\frac{9}{64}$ inch hex key, remove the cap screw. Pull the old shoe cartridge free of the engrave head.
5. Place the new shoe on the shoe block and re-install the cap screw. The shoe is keyed to prevent improper installation. Tighten the screw.

The shoe diamond has a slight radius on the surface and requires no additional setup.



6. Open the Screen page.



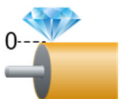
7. Press the Stylus Angle field then select the installed stylus angle.
This action forces the Spectrum engraver to move the shoe forward and protect the stylus. This also instructs the machine that a Tip Calibration is necessary. This is performed automatically during EasyCell or QuickCell converges.

This completes the shoe replacement.

If you want to perform a manual Tip Calibration, go to step 8.



8. Open the *Cell Setup* page.



9. Select the Tip Cal button to start an automatic head calibration. The shoe is positioned correctly during the Tip Calibration routine.

Stylus

Stylus – OGT part number 320220-XX



The stylus is the cutting diamond, moving in and out of the copper according to the signal data received by the engrave head. The stylus comes in various tip angles to allow different cell depths depending on the printing application.

The stylus is a trapezoid to prevent improper installation. The diamond tip of the stylus should always be pointing out of the stylus arm.

CAUTION: Do not insert the stylus point first into the stylus arm. This will break the diamond and render it useless.

Stylus Installation and Replacement

The stylus requires frequent replacement. Three common reasons for replacing the stylus are:

- ❖ Changes in stylus angle based on job requirements, i.e., screen, coating volume, ink solvent type, etc.
- ❖ Normal wear, diamonds do become unsharp with use.
- ❖ Breakage, due to defects in the cylinder or excessive wear on the stylus.

The following table lists the available styli and their corresponding colour codes:

Stylus Degree	Color Code	Ohio GT Part Number
90°		320220-90
95°		320220-095
100°	silver	320220-01
105°	white	320220-05
110°	black	320220-10
115°	purple	320220-15
120°	blue	320220-20
125°	green	320220-25
130°	red	320220-30
135°	yellow	320220-35
140°	orange	320220-40
145°	brown	320220-45

CAUTION! Use only the OHIO supplied torque wrench and hex bit to prevent serious damage to the engrave head. This torque wrench and bit are found in the toolkit provided with the machine.

To replace the stylus:



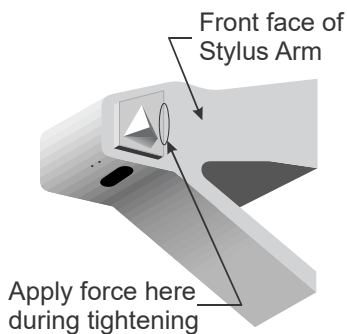
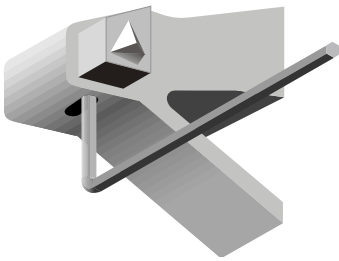
1. Touch the Head Out button to retract the engrave head fully away from the cylinder.
2. Turn OFF the AC/Vacuum button.

3. Loosen the setscrew holding the stylus using the torque wrench and hex bit supplied with the engraver. Loosen the screw no more than one full turn of the wrench. Use the front access hole only – the back hole is unused.

CAUTION: Avoid touching the diamond tip of the stylus.

Remove the stylus from the holder using a small hexkey or bent paperclip. Insert the wrench through the slot in the bottom of the stylus holder and into the stylus (see graphic to the left). Gently pull the stylus forward. Without touching the diamond tip, grasp the stylus and remove it from the stylus arm.

A piece of clay can be used to grab the stylus and pull it free of the arm.



4. Insert the new stylus until it makes contact with the back of the arm. The arm in the hole is keyed to prevent you from putting the tool in wrong.

Important: The stylus must be seated in the back of the stylus arm to avoid possible problems with Tip Calibration. Always keep pressure against the stylus when tightening the setscrew in the following instructions.

5. With your fingernail or fingertip, apply light pressure on the left edge of the stylus (see graphic to the left). Push the stylus back, to position the stylus against the rear wall of the stylus arm.

6. The Stylus Window may or may not appear – depending on machine configuration – when the torque wrench is inserted into the engrave head. This serves two purposes:

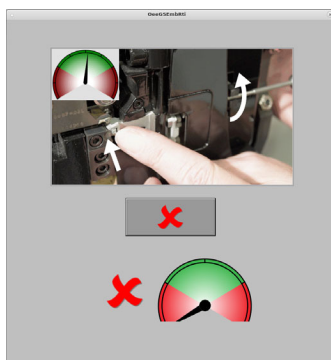
- To aid you in the stylus installation through the Position Gauge. The Position Gauge indicates when a stylus is installed properly through the use of on-board electronics.
- To select the stylus angle being installed into the engrave head.

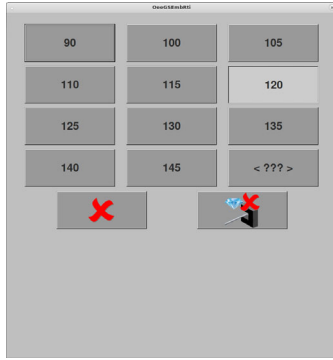
The Position Gauge moves as you press against the stylus. The goal is to tighten the setscrew with the gauge in the green range. Keep pressure against the stylus while you tighten the setscrew and remove the torque wrench. The torque wrench is tight when it clicks at the correct tightness.

A correct installation shows a green checkmark left of the Position Gauge.

An incorrect installation shows a red X left of the gauge. If this occurs it is necessary to loosen the setscrew and repeat step 6 for proper installation.

Important: The torque wrench must be removed with the gauge in the green range to register as a correct installation. Do not release pressure against the stylus until the torque wrench is removed.





7. Select the angle of the new stylus.

This informs the Spectrum of the stylus change and adds a Tip Calibration routine to either the EasyCell or QuickCell routines.

If manual test cuts are going to be made, run a Tip Calibration from the Cell Setup page.

Note: This window was two Cancel options.



Cancel stops the current operation of selecting a stylus angle.



Cancel and Disable the Stylus Sensor Tool. This is used if the tool sensor has become defective on the engrave head. This is seen by the Stylus Angle window repeatedly appearing when no stylus change is taking place. OHIO service should be contacted if you see this condition.

Touching this button turns OFF the feature in the machine Configuration. If you accidentally turned off the tool sensor, the feature can be found here in the Config:

Configuration>Hardware Configuration Tab>Stylus Change Sensor Available

The Spectrum has the ability to track the time a stylus is used. This provides a quick and easy way to determine stylus life. To use the Stylus Life function, you must enable the *Stylus Life Table* option in the General tab of the configuration page. For more information on this function, see *Stylus Life Table* in Chapter 3.

CAUTION: Failure to match the Stylus Angle with the installed stylus can result in poor engraving performance. The machine uses the full cell depth to select the optimum head ‘tune’. The stylus angle determines the cell depth, so an improper stylus angle can cause the wrong tune to be used.

CAUTION: Using the wrong stylus angle causes the Spectrum software to make improper decisions. Adjustments are based on the stylus angle. If the job calls for a 120° stylus but a 130° stylus is actually used, the correction factors to achieve the proper cell sizes will be wrong and will lengthen setup times. Additional problems may result at a later time if the job parameters – screen, screen angle and stylus angle – are saved to the Learn table with the wrong stylus value. This will affect both EasyCell and QuickCell setup procedures.

Burr Cutter

Burr Cutter – OGT part number 320007-02



The burr cutter trims the raised edges (burrs) from the edge of the cells. Burrs are an expected side effect of engraving and are directly related to copper quality and the screen angle being cut. The burr cutter is mounted directly above the stylus to cut burrs from the most recently engraved cells.

The burr cutter sits above the stylus on a pivoting yoke. A single screw holds the burr cutter to the yoke. The burr cutter is keyed to simplify installation.


Burr Cutter Installation and Replacement

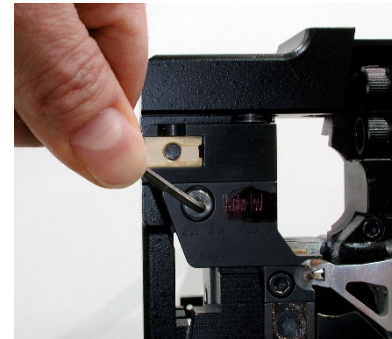
Like the shoe, the burr cutter needs to be changed less often than the stylus. Average life for the burr cutter with normal use is four to six months.

Replace the burr cutter when you experience the following problems:

- ❖ Increased difficulty setting up the burr cutter.
- ❖ Excessive burr around the cell walls. When the burr cutter is dull, the burr gets folded over rather than cut off the cylinder.

To change the burr cutter:

1. Touch the Head Out button  to fully retract the engrave head.
2. Remove the shoulder screw from the front of the burr cutter and pull the burr cutter cartridge free from the unit.
3. Place the new burr cutter onto the yoke and re-install the shoulder screw.
4. Align the burr cutter as described in the next section.



Burr Cutter Alignment

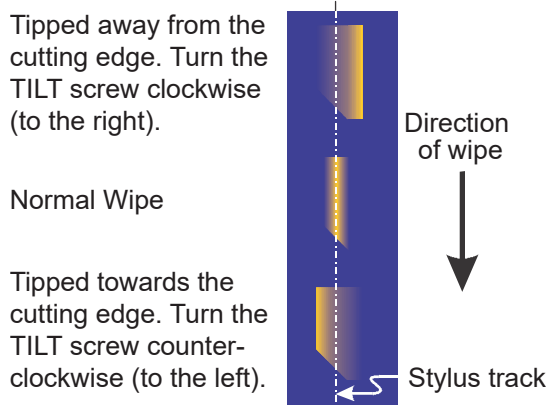
Two different adjustments are used when aligning the burr cutter to the cylinder:

- ❖ A tilt screw for adjusting the flatness of the cutting diamond.
- ❖ The burr cutter adjust for aligning the cutting edge over the stylus.

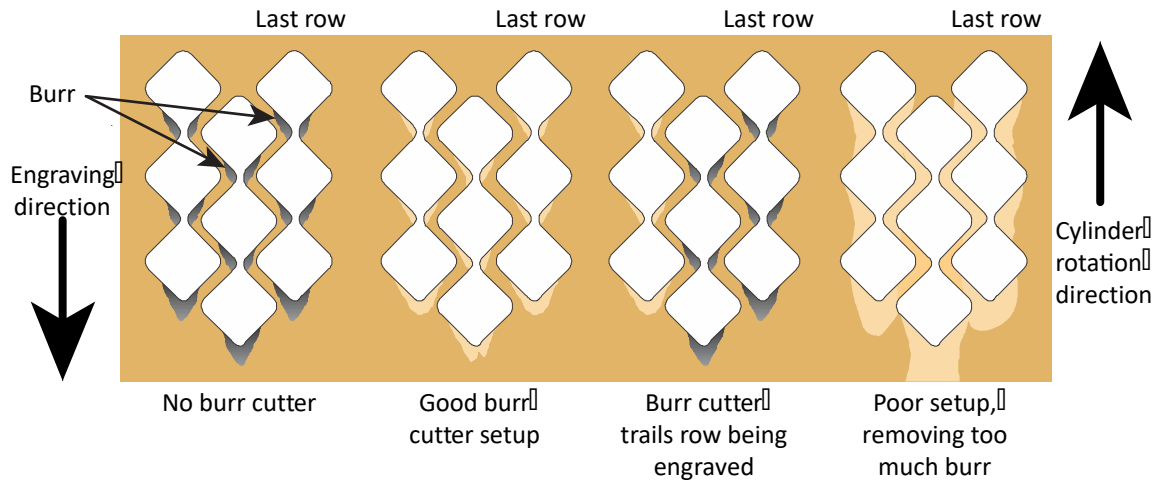
To setup and align the burr cutter:


Note: The alignment procedure is easier with the head cover removed.

1. Apply a thin film of oil-based paint to a small area on the cylinder.
2. Lower the head against the cylinder, positioning the burr cutter in the paint area.
3. Check the flatness of the burr cutter to the cylinder by rotating the cylinder up and away from you a small distance. Compare the mark in the paint with the example shown.



4. Turn the tilt screw to achieve a normal wipe.
5. Repeat steps 3 and 4 until the burr cutter has a normal wipe. Proceed to step 6.
6. Make the final adjustment of the burr cutter when engraving the test blocks. At that time you can view the effect the burr cutter has on the cells being cut. Look at the last two rows engraved (right side of display) to verify if the burr is being removed from the cells.



Move the burr cutter left or right by entering an offset value. See  *Burr Cutter Offset* on page 56.

Move the burr cutter to the left by entering a negative number (-xxx).

Move the burr cutter to the right by entering a positive number (+xxx).

Each number equals 0.68 microns of horizontal movement, so a change of +100 counts moves the burr cutter 68 microns to the right.

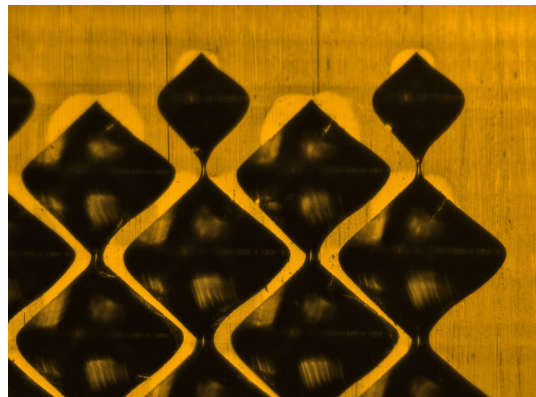
- b) Press the Move Burr Cutter button  to reposition the burr cutter.

Note: Remember the offset value being entered as it may take several values to align the burr cutter in the proper location.

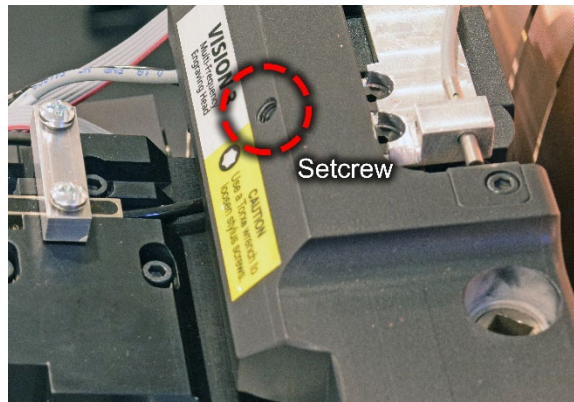
7. Repeat step 6, adjusting the Burr Cutter Offset, until the burr cutter is properly aligned over the last row of engraving.

If there is not enough of the burr being removed from the cells, increase the amount being cut by tipping the burr cutter diamond toward the cutting edge. Turn the tilt screw clockwise.

An example of burr being removed on a 37° screen angle cell. Note the shiny areas to the left of each channel, this is where burr is being removed. At the same time, not all the roughness from the copper finishing is being removed, indicating a good burr cutter setting.



8. The last step is to set the yoke position. Do this by adjusting the setscrew at the top of the yoke.



- a. Lower the head against the cylinder.
- b. Turn the setscrew anti-clockwise 4 turns.
- c. Adjust the screw clockwise until you see the yoke move away from the cylinder, then reverse direction by $\frac{3}{4}$ of a turn anti-clockwise.

CAUTION: Turning the screw clockwise a large amount may cause the burr cutter yoke to interfere with the camera. This prevents the camera from focusing on the cylinder.

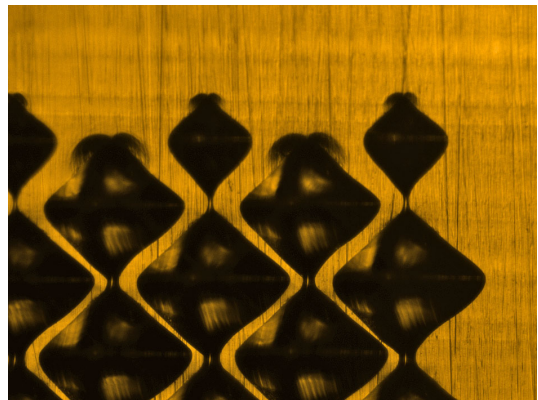
Burr Cutter Setup Hints

The following pictures show different burr cutter conditions. These pictures are of a 37° screen angle. Remember that the lower the screen angle, the greater the burr. A 60° cell may show little or no burr.

No Burr Cutter

This picture shows engraving where no burr is being removed, apparent in the dark areas at the top of the cells. This may be due to:

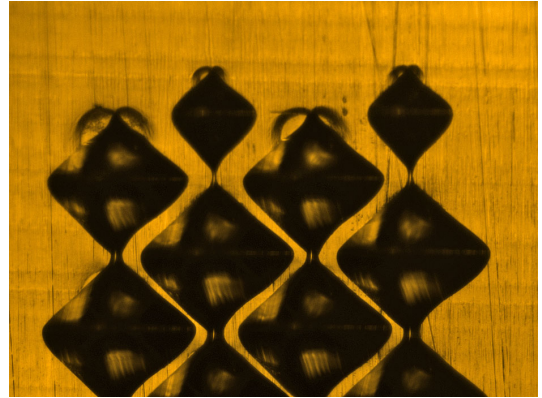
- 1) The burr cutter is positioned ahead of the last row (to the right in the picture).
- 2) The burr cutter is trailing behind the cells (left in the picture).
- 3) The burr cutter yoke is lifting the diamond off the cylinder.



Burr Cutter is behind

Here the cutting is taking place one row behind the last row engraved. This is not a bad condition. If more than one row behind, move the burr cutter to the right using the *Burr Cutter Offset*.

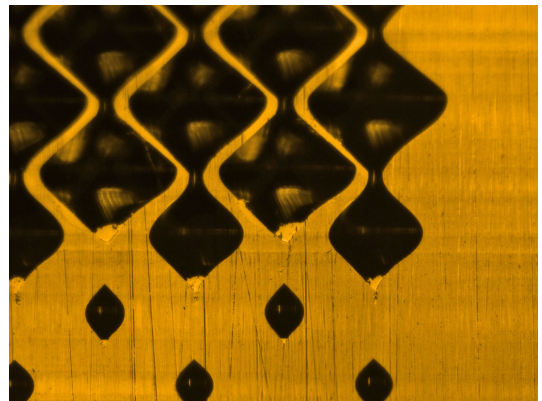
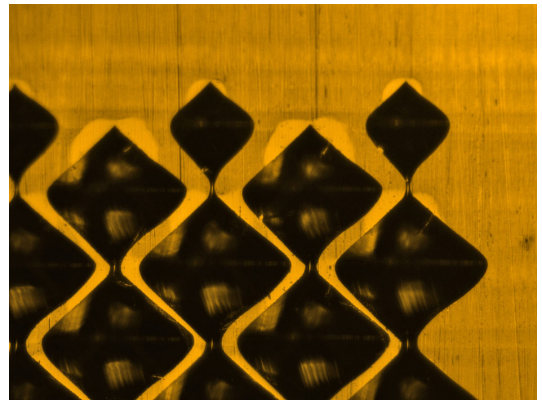
A worse problem is the small amount of burr being removed – you can see some darkness at the cell tops so the cut needs to be increased. Do this by turning the tilt screw clockwise a small amount, such as 30°.



Good burr cutter setup

This is a very good burr cutter position. The shiny areas above the cells indicate the burr is being removed cleanly. You can still see the finishing marks on the walls between the cells – this means the cut is not too heavy.

The picture below and below right show two more views of this setup. Notice how clean the cells are and also the lack of debris resulting from the burr cutting action.



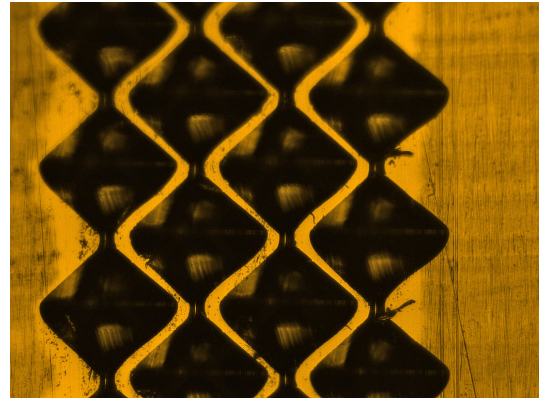
Bad burr cutter setup – Too heavy

Here the cylinder surface is being affected by the burr cutter. The copper surface in the cell walls no longer shows finishing marks.

The pictures below and below right show cutting where cells are not, like in-between highlight cells.

Debris is appearing due to the cutting action. Compare the picture to the right with the good setup above. Also look at the copper debris near the channels on the last row in the lower right picture.

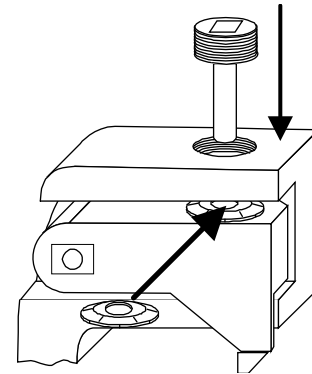
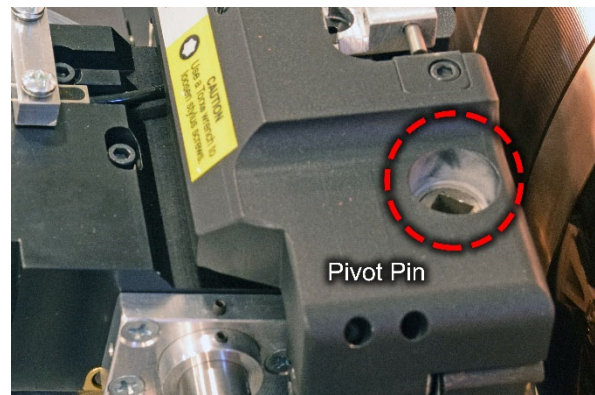




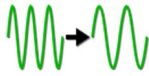
Pivot Pin

The burr cutter pivot pin runs vertically through the burr cutter yoke. This pin is normally not adjusted or removed. If the pin is removed, the correct installation procedure must be followed.

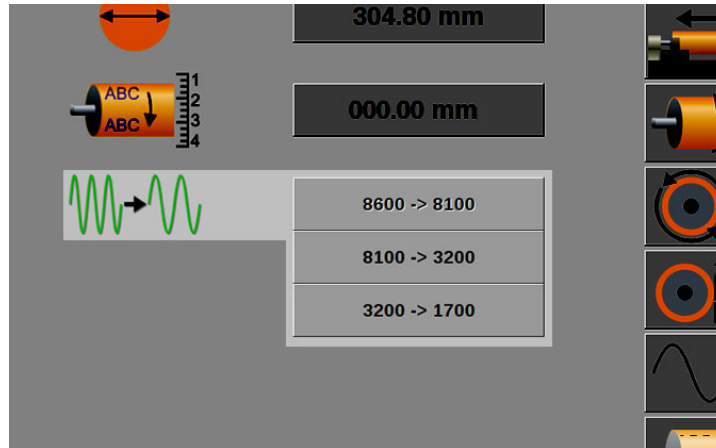
1. Wipe the pin clean and then apply a thin coating of grease to the smooth surface. Use the multi-purpose grease from the machine tool kit, part number D1645-0024.
2. Place the spring washer between the burr cutter and upper yoke so the pin will pass through it.
3. Using the nut-driver handle from the toolkit, tighten the pivot pin fully clockwise, then reverse direction and turn the pin $\frac{1}{2}$ turn anti-clockwise. This ensures the spring washer is not fully compressed and allows for a smooth pivoting action when adjusting the burr cutter tilt.



Frequency Override – Changing Engraving Speed



The Frequency Override buttons allow the operator to change the engraving speed. This may be necessary due to copper quality or to slow the cylinder rotation. The machine automatically determines the engrave head speed based on cell/stylus specifications and the available speeds of your engrave head.



The possible override choices are:

8600 Hz -> 8100 Hz

8100 Hz -> 3200 Hz

3200 Hz -> 1700 Hz

8100 Hz -> 1700 Hz (not shown above)

Note: The Frequency Override buttons are setup during machine testing at the OHIO factory.

Example of using Frequency Override

Engrave screen – 60 l/cm @ 34° angle

Stylus angle – 120° (approximately 57µ cell depth for the screen)

Cutting frequency defined by machine – 8100 Hz

Copper quality – Poor, with significant burrs indicating soft copper

The machine determines 8100 Hz is the appropriate engraving speed. Test cuts show poor copper, with walls breaking out between full cells. A slower cutting speed may create a cleaner cut. Do this by:

1. Stop the cylinder Rotation.
2. Press the 8100 Hz → 3200 Hz or 8100 Hz → 1700 Hz button to select the slower cutting frequency.
3. Restart the testcut process.

Note: Testcuts must always be performed when changing between engraving speeds.

Vacuum Bag Replacement

Check the vacuum bag daily, and change it when it is $\frac{3}{4}$ full. Refer to the *Spectrum Preventive Maintenance Manual* (document 9420-0046) for a full maintenance schedule.



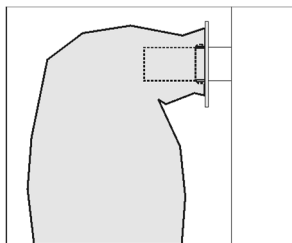
Vacuum bag in the cavity on the rear of the Spectrum

To replace the vacuum bag:



1. Turn OFF the engrave head AC power and vacuum system.
2. Open the vacuum bag access door, on the rear of the engraver.
3. Remove the bag by pulling the cardboard flange to the left until it clears the exhaust hose.
4. Discard the bag.
OHIO GT encourages you to recycle the copper chips.

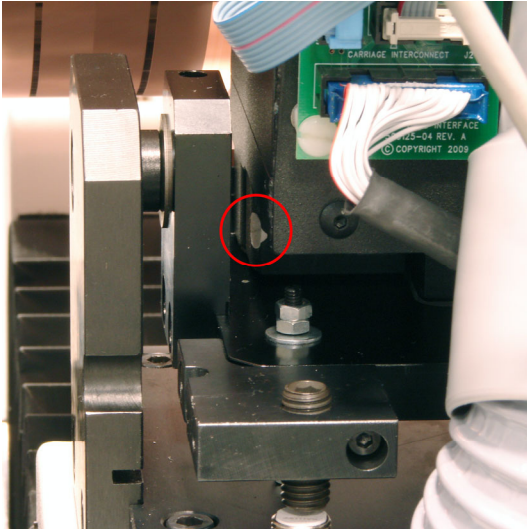
CAUTION: Vacuum bags should not be reused to prevent bag breakage.



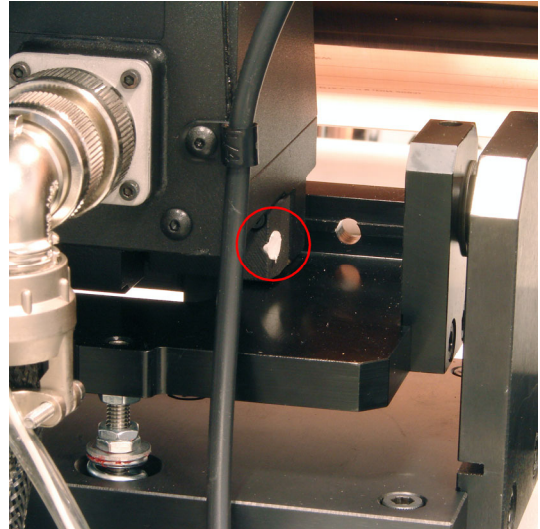
5. Install a new bag by sliding the opening over the lip on the vacuum tube. Slide the cardboard flange until it sits securely on the tapered ring. This reduces the chances of the bag falling off.
6. Close the door.

Changing the Engrave Head Air Filters

Replace the small air filters under the engrave head once every two weeks. These filters prevent dirt from entering the engrave head and provide a clean source of air to cool the motor in the engrave head.



Left air filter



Right air filter

Please refer to the *Spectrum Preventive Maintenance Manual* (document 9420-0046) instructions and also for a full maintenance schedule for the Spectrum.



Miscellaneous

This chapter contains information on calibrating and adjusting the camera of the Vista® Cell Sensing System, using the OHIO Dashboard and associated Birth Certificate, and the Hardware Debugger.

Manually Focusing the Vista System

The Spectrum engraver uses the VISTA camera with auto-focus, part of EasyCell, QuickCell, and Volume converge routines. Changing the focus manually during the converge routines is not possible.

Changing the focus is possible when using the Vista camera for manual measurements. This might be necessary when attempting to cut a manual test cut where the auto-focus does not occur.

To adjust the camera focus manually:



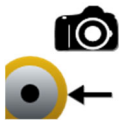
1. Open the VISTA page.



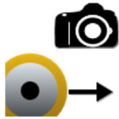
2. Press the Live Video button. This lowers the engrave head against the cylinder.



3. Open the VISTA Calibration page. Use the Focus In, Focus Out, and Focus Distance buttons to move the camera into or away from the cylinder to achieve optimum focus.



Focus In – Moves the camera towards the cylinder.



Focus Out – Moves the camera away from the cylinder.



Focus Distance – Sets the distance the camera moves with each touch of the Focus In or Focus Out buttons. A value of 25 is a good number to use for small adjustments.

5. Exit the VISTA Calibration page when finished focusing.

Note: This manual focus location is only maintained until the next EasyCell or QuickCell Converge sequence. At that time the focus is adjusted as part of the automatic routine.

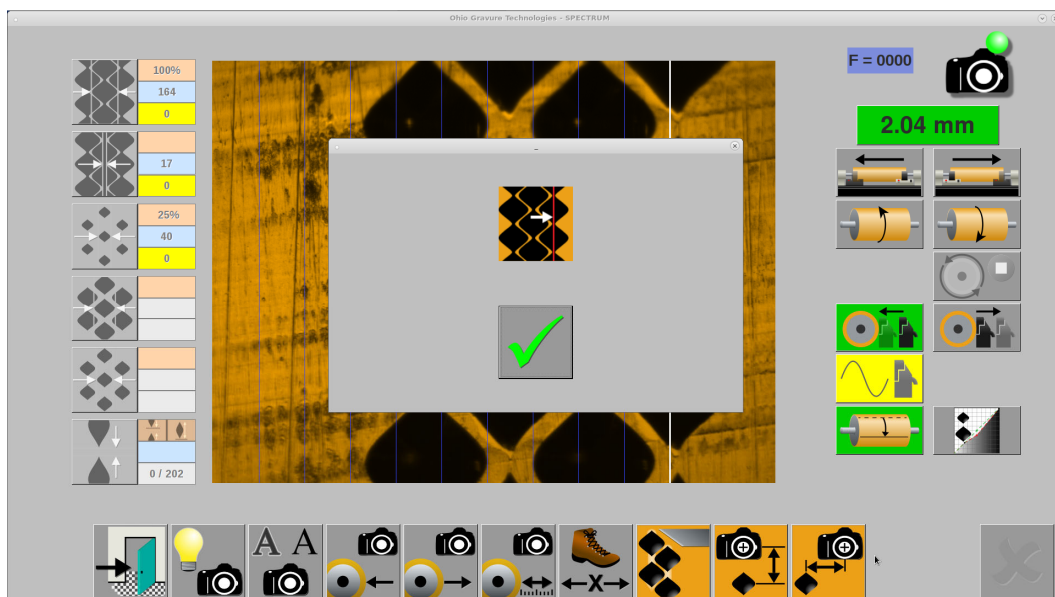
Aligning and Calibrating the Vista System Camera

Check the camera calibration periodically to ensure optimum VISTA system performance and accuracy. OHIO GT recommends checking the calibration once a year. Camera calibration should remain very consistent and may not need any correction when you check calibration.

Camera Alignment

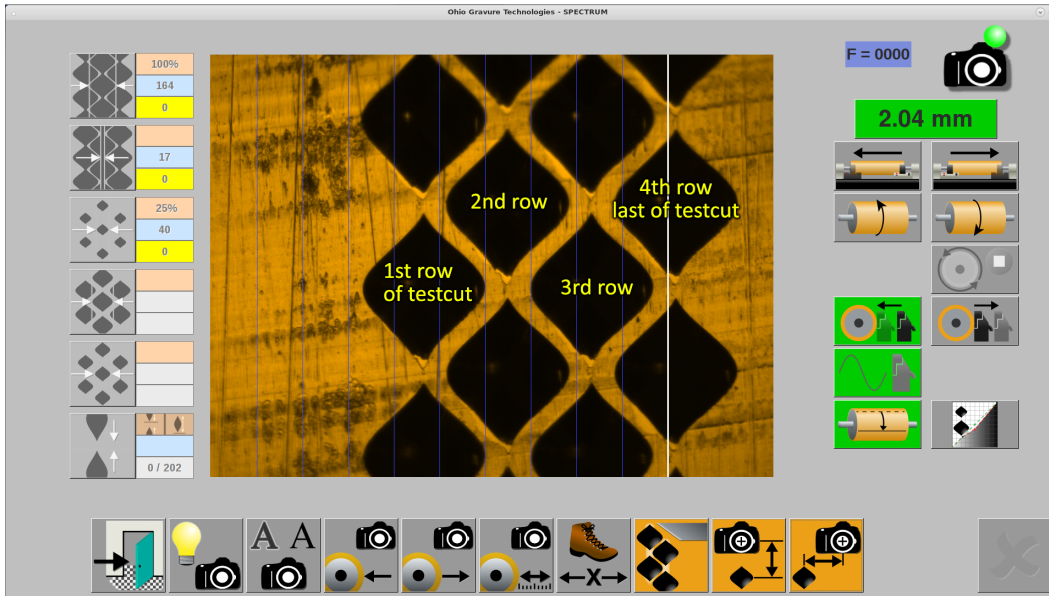
Align the camera horizontally to maintain optimum results from the VISTA Cell Measuring System. There are two things to consider in the camera alignment:

- Horizontal alignment – The white line on the right side of the display is used for this purpose.
- Rotational alignment – The blue lines running vertically through the display are used for this purpose.



A camera positioned at the correct horizontal location has the last row of the test cut centered on the white line. The picture above shows the display with the alignment sub-window visible. The sub-window is hidden when the checkmark is touched, allowing an unobstructed view of the cells and line. The picture below shows the view with the sub-window removed.

Note: Remember, align the camera horizontally to the white line. The blue lines are used for rotational alignment, explained later in this chapter.



Alignment of the VISTA Camera

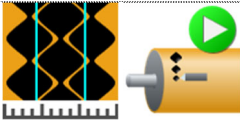
Rotational Alignment of Camera

1. Un-select any cylinder currently loaded on the Engrave page.

2. Load a cylinder into the machine.



3. Set the proper cylinder size on the Screen page, and set to a 70 l/cm screen 45° screen angle.



4. Open the Cell Setup page, then make a test cut.



5. Open the Vista page, then turn on the VISTA camera function. The head lowers against the cylinder.

6. Position the cylinder so you can see the full cell area of the testcut. Either the Nested or Stripe area will work.

DO NOT move the carriage horizontally, only rotate the cylinder.

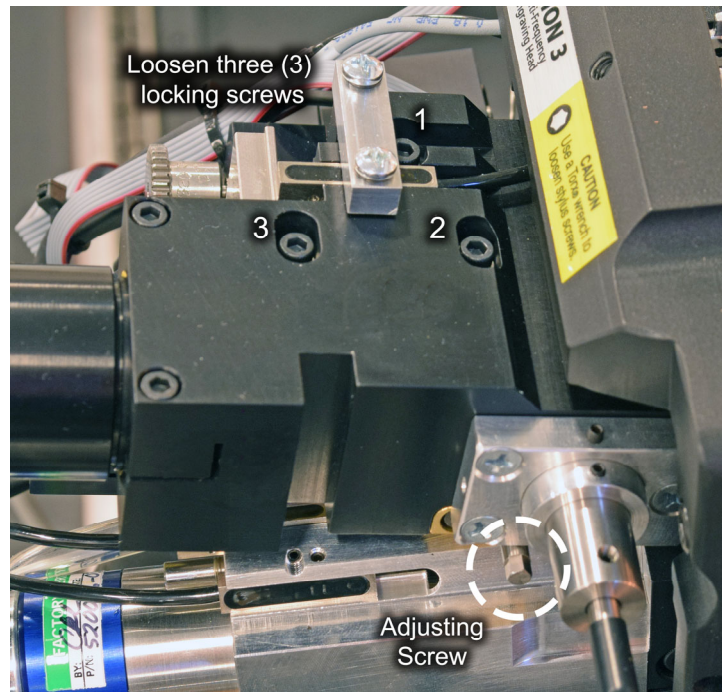


7. Touch the Camera Utilities button then touch the Horizontal Alignment button.

A sub-window appears on the screen showing you the location where the vertical white line should cross the cells. Press OK to remove the window and see the cells and line position.

If the white line is centered through the last row of cells, you are finished and alignment is not necessary. Go to step 11 to verify rotation alignment. If not, go to step 8.

- Slightly loosen the three (3) locking screws on the top of the camera block. These screws are set in slotted holes to allow for camera block movement. See following picture.



Adjusting and locking screws for camera

- Turn the adjusting screw on the right side of the camera block – see picture above – to shift the image left or right. Use the adjusting tool (D370029-01) from the Spectrum tool kit, or a 9/64" open-end wrench, for adjusting the screw.

CAUTION: Use extreme care not to damage the adjusting screw if using a wrench.



D370029-01

To move the image:	Turn adjusting screw:
← Left ←	⤿ Anti-clockwise
→ Right →	⤻ Clockwise

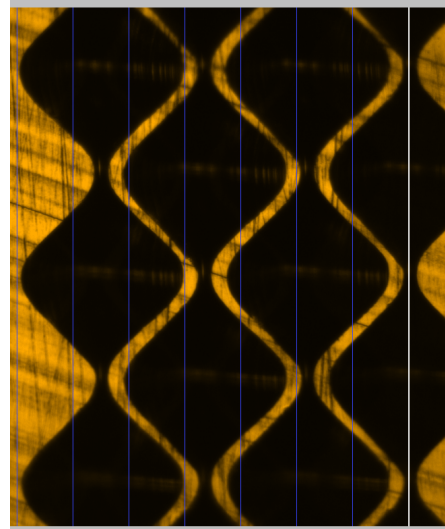
- Tighten the locking screws. The camera may shift slightly while tightening the locking screws. Use the adjusting screw to move the cells back into proper alignment as you tighten the locking screws.

Vertical Alignment of Camera

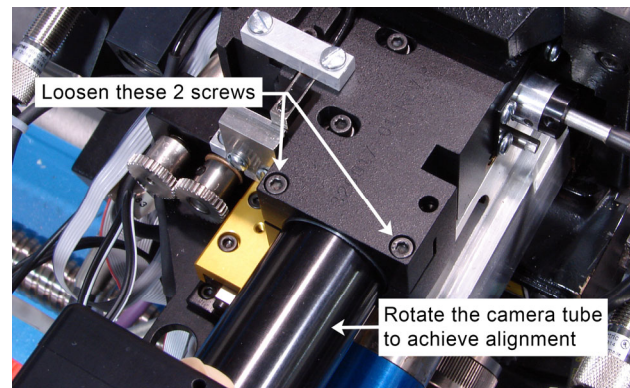
The cells should run vertically through the display – channel measurement can be affected if the cells are skewed. Use the blue lines to verify the rotation of the camera. Multiple blue lines allow you to choose a line that is close to either a channel or cell edge to verify if the camera is straight and not rotated. If not, adjust the camera rotation by slightly loosening the two screws clamping onto the camera tube.

11. Check the rotation of the camera. For this you can use either the white line or the blue lines running vertically through the display. Choose a cell/channel and a blue line that are easy to see if the cells are running vertically. The picture to the right shows good camera rotational alignment. The cells are running vertically through the display. This can be seen with the white line or with the blue line running along the right cell edge of the first row.

If the cells are not vertical, you must adjust the camera. Go to step 12.



12. Rotate the camera gently until the cell/channel aligns with a blue or white line. Do this by loosening the two screws holding the camera tube and rotating the camera. Tighten the two screws noting that the camera may shift slightly during tightening. Once the camera rotation is correct, re-check the horizontal camera position using the white line.



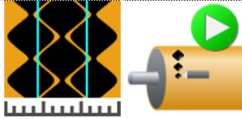
13. Exit the Vista page.
14. *Optional step* – Setup the machine to engrave the coarsest screen/raster – i.e., biggest cell – that you currently use. Change the stylus if necessary. Perform a Converge sequence, either EasyCell or QuickCell, to see if the single cell is positioned with the entire cell visible. Cancel the routine if the single cell is visible but does not fall totally inside the display. Repeat the alignment routine starting from step 3. When aligning the cell in the display, position the cell left or right according to the direction the cell was cut off during the single cell routine.

Note: The maximum cell width that can be measured by EasyCell or QuickCell is 375 μm . Larger sizes must be measured manually. The maximum cell width that can be measured manually is 475 μm . The entire cell must be visible in the display to measure any cell width, automatically or manually.

Camera Magnification Calibration



1. Load a cylinder into the machine and enter the cylinder's diameter or circumference on the Screen page.
2. Enter a 70 l/cm 45° raster on the Screen page.



3. Open the Cell Setup page and then engrave test cuts. Cell size is not critical in this operation. We will be measuring the spacing of the cells and not the cell widths.



4. Open the Vista page and then turn ON the Vista camera function.

5. Move to the highlight cells of the test cut and measure from the center of one cell to the center of another. Using the tip of a cell is a good location to ensure consistent measurement. The row to row spacing is 101 µm; use as many rows as possible to increase accuracy. Multiply 101 by the number of rows – normally three – being measured.

If the measured value is not correct, you will need to adjust the horizontal resolution of the camera. Determine the error between the target and measured sizes:

Example

(Target Size / Measured Size) = Correction Factor

$$(101 * 3 \text{ rows}) / 312 = 0.971153$$

6. Exit the Vista page and go to the Configuration page. Move across the tabs until the Vista Measure tab is shown. Find the Horizontal Resolution value. Multiply the resolution by the Correction Factor.

Example

Current Horizontal Resolution * Correction Factor = New Horizontal Resolution

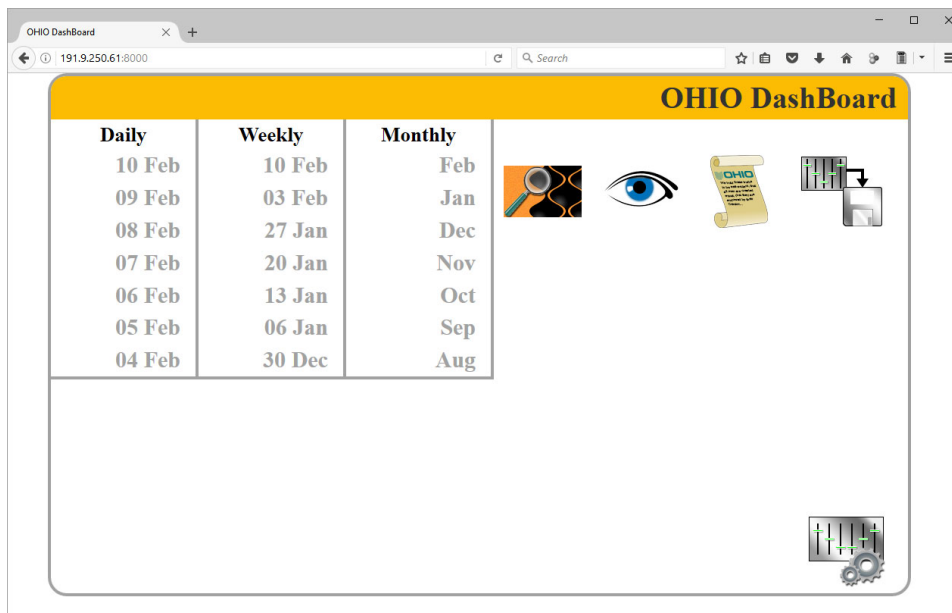
$$0.697933 * 0.971153 = 0.6678$$

Enter this new value into the Horizontal Resolution. Go back to step 4 and measure the cells again to confirm the new value is correct.

Once confirmed, return to the Configuration page and set the Vertical Resolution to the same value.

OHIO Dashboard

The Spectrum engraver also includes management information software to track cylinder throughput and machine productivity, the OHIO Dashboard. Each Spectrum has a Dashboard so it is possible to view the statistics and status of each machine.



The OHIO Dashboard monitors and records the jobs being engraved, collecting information about:

- Cylinders engraved by day, week, and month
- Cylinders engraved by job ID
- Time for cylinder testcuts
- Time for production engraving
- Cylinder success
- Machine activity level

This information can then be accessed via web browser – Chrome, Firefox, Edge – by any PC on the same network as the engraver.

Additionally, the OHIO Dashboard provides troubleshooting assistance by packaging up machine log or configuration files for emailing to the OHIO service group.

Birth Certificate

The OHIO Dashboard provides an easy way to manage and obtain Birth Certificates created with each cylinder. The Birth Certificate is created for every production cylinder engraved. It includes cell setup information including measurements and pictures of the cells, and Midtone cell data. Information collected during the cylinder engraving is also available in the Birth Certificate for those machines equipped with optional DocuCell or Vital-Proof functions.

The Birth Certificate is presented as an Adobe PDF file for ease of viewing and retrieval.

Note: The Birth Certificate is a document that can be presented to the cylinder end-user for quality purposes. Your company logo can be added to the Birth Certificate so the user will know who engraved the cylinders. For more information on adding your company logo, contact service@ohiogt.com.

Using the OHIO Dashboard

The OHIO Dashboard can be accessed by any PC with a web browser on the same network as the engraver. To access the Dashboard:

- 1) Open a web browser and maximize the window.
- 2) Enter the engraver IP address followed by :8000
An example is: 191.9.205.85:8000
- 3) The Dashboard appears in the browser.

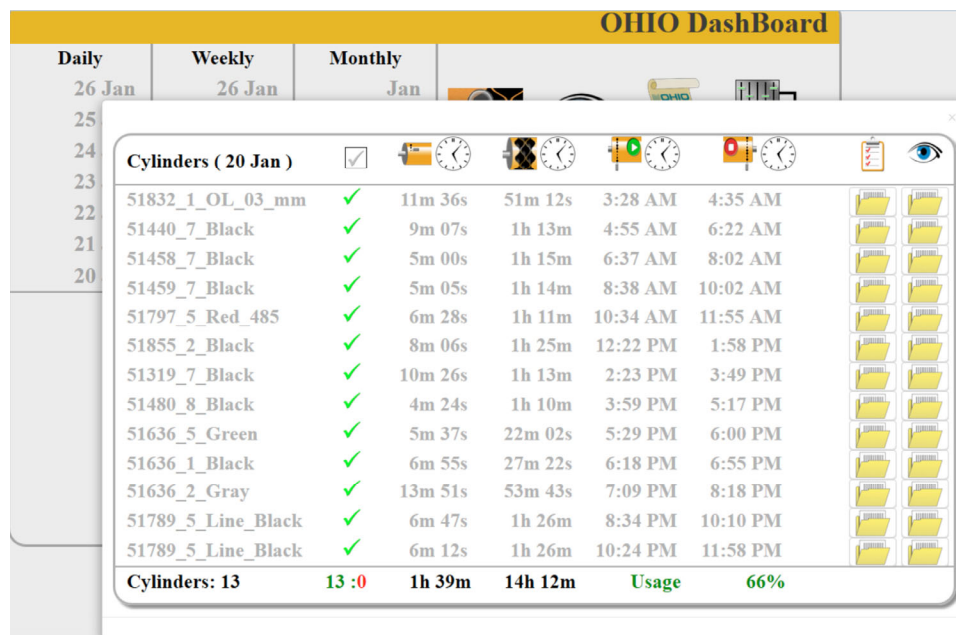
From this window you will see three columns on the left side labeled Daily, Weekly, and Monthly.

Daily – Allows you to see the machine statistics for a day. The last seven days are shown.

Weekly – Provides an overview of the weekly activity, with the number of cylinders engraved as well as the machine productivity.

Monthly – Provides an overview of the monthly activity, again showing number of cylinders and machine productivity.

Click on a date to open a window showing you the information for that time period.



Job ID	Status	Start Time	End Time
51832_1_OL_03_mm	✓	11m 36s	51m 12s
51440_7_Black	✓	9m 07s	1h 13m
51458_7_Black	✓	5m 00s	1h 15m
51459_7_Black	✓	5m 05s	1h 14m
51797_5_Red_485	✓	6m 28s	1h 11m
51855_2_Black	✓	8m 06s	1h 25m
51319_7_Black	✓	10m 26s	1h 13m
51480_8_Black	✓	4m 24s	1h 10m
51636_5_Green	✓	5m 37s	22m 02s
51636_1_Black	✓	6m 55s	27m 22s
51636_2_Gray	✓	13m 51s	53m 43s
51789_5_Line_Black	✓	6m 47s	1h 26m
51789_5_Line_Black	✓	6m 12s	1h 26m

Cylinders: 13 **13 :0** **1h 39m** **14h 12m** **Usage** **66%**

Window showing the daily engraver activity

Basic Information on Main Window



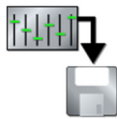
Live Video – Displays the last 10 images captured by the Live Video function of the engraver. These images are only available if Live Video is active on the engraver. This is not updated automatically and requires the operator to refresh the browser to see the latest images. This function is being developed and may not yet be working on your version of software.



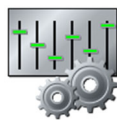
Not active. For future enhancements.



Automatically bundles and downloads the Log files for the machine being viewed, which can then be emailed. This can be used for troubleshooting assistance by the Ohio Service group. When pressed, the operator is prompted to select a download location for the file containing the machine logs.



Automatically bundles and downloads the machine Configuration files for the machine being viewed. When pressed, the operator is prompted to select a download location for the file containing the Configuration files. This is a second method to backup files.



Located in the lower right corner, this button opens the settings for the Dashboard. See Dashboard Settings for more information.

Daily Window Information

The following information is available when a day is selected from the Daily column:

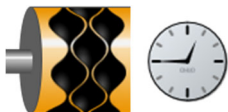
Cylinders (date) Shows the cylinders engraved for the day. These are listed by the Job ID of each cylinder. At the bottom of the column is the total cylinders for the day.



Identifies the result of the engraving, whether successful (green) or failed (red). A Failed condition occurs when the engraving is stopped due to an operator intervention (stylus chip, etc.) or when the machine halts engraving.



Displays the testcut setup time for a cylinder, from the moment the operator starts the testcut routine.



Displays the engraving time of the cylinder. This includes all time from the beginning of the testcut routine until the cylinder finished engraving. This time will include any pauses between when testcuts end and production engraving begins.



Displays the start time for the testcut routine. This is not the start time for the engraving of the job.



Displays the time the production engraving finishes.



Downloads the Birth Certificate associated with the cylinder.



Downloads any operator saved images linked to the job.

Weekly and Monthly Window Information

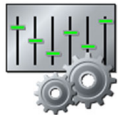


Identifies, in percentage, the amount of time the machine was actively producing cylinders during the day or week.

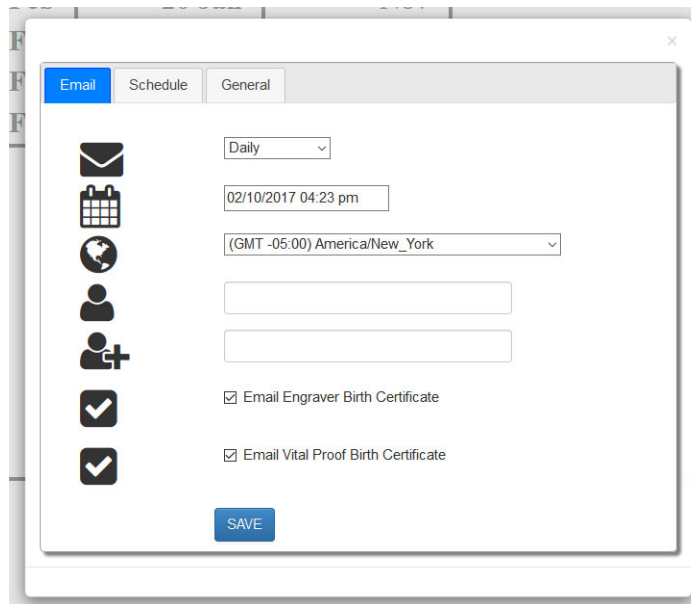


Displays the number of cylinders produced by the day in weekly view, or week in monthly view.

Dashboard Settings



There are operator configurable items for the OHIO Dashboard. The Settings are found by touching the Config button in the lower right corner of the Dashboard. When pressed, the following window opens:



There are three tabs on this window: Email, Schedule, and General.

Email Tab – *future use*

Email is used to setup the automatic posting of the Dashboard information. This function allows you to see pertinent information delivered directly to your inbox. The functions you have control over are:



Email Frequency – Select Daily, Every 2 Days, or Weekly reports sent by email.



Set the current date and time on the system.



Select the time zone you are in.



The person(s) that email reports will be sent to. There can be up to two (2) persons identified.



Use to add a person to the email distribution list. Enter the necessary email address and hit return to add the person.



Click to include Birth Certificates with the email report.

Note: This creates large emails. Not suggested when engraving large numbers of cylinders.



Click to include Vital Proof Birth Certificates with the email report.

Note: This creates large emails. Not suggested when engraving large numbers of cylinders.

Schedule Tab

Setup the number of hours an engraver is running each day during a normal week. This area allows you to customize each day so that production numbers are based on the actual shifts worked.

General Tab

Setup the Engrave Name, and the number of days, weeks and months to display in the Dashboard.

The Engrave Name should be specific, especially if you have multiple engravers, so that you know which machine the Dashboard is looking at. If you have three Spectrum engravers, give each a name that is easily identified. The web browser can show the Dashboard for each machine simultaneously using a different tab for each Dashboard.

Hardware (HW) Debugger

What It Does

The Spectrum has a Diagnostics area for reviewing sensor operation on the machine.

Hardware Debugger

The HW Debugger page provides the ability to review the status of the numerous sensors found on the engraver. These sensors include carriage limits, end seeking proxes and many others. A HW Debugger is found on the Diagnostics page.

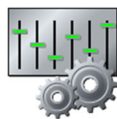
The purpose of this page is to easily identify if a sensor or proximity switch is working. The function is simple, activate the sensor/switch and watch the Hardware Debugger to see if the icon flashes. If it does, the sensor/switch is working, if it does not, the sensor/switch is likely defective. Brief instructions for each sensor/switch will be given in the appropriate group.

All tests are performed with the engraver power turned ON.



To use this page:

1. Open the Utilities page.



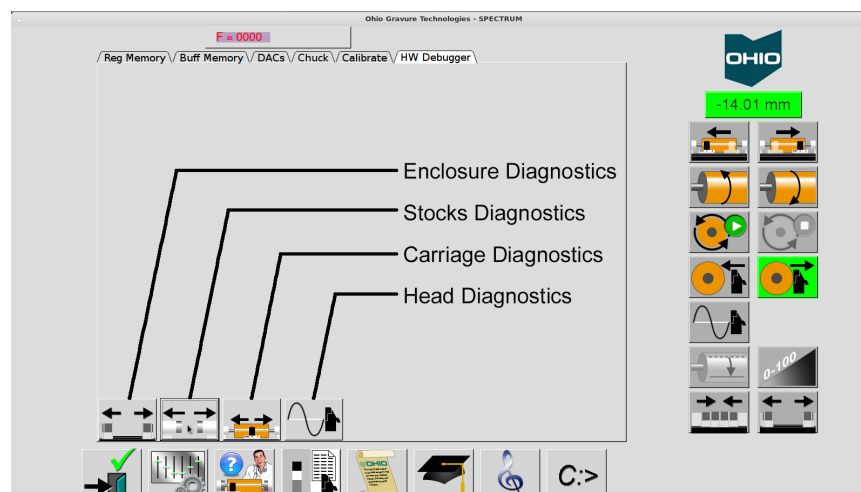
2. Open the Configuration page.



3. Click the Key button and enter the password 1234. The button shows a green key when active.



4. Open the Diagnostics page.
5. Select the HW Debugger tab from the top of the window. The following page displays.



Hardware Debugger Tab and buttons

Four buttons – in the lower left – group machine sensors by function/location. The four buttons are:

- Enclosure Diagnostics – Displays sensors controlling the motorized enclosures.
- Stocks Diagnostics – Displays sensors pertaining to stock movement or items installed on the stocks, like AutoChucks.
- Carriage Diagnostics – Displays sensors found on the carriage or that affect the carriage.
- Head Diagnostics – Displays sensors found on the engrave head and sub-carriage.

Sensor Description

There are different types of sensors used on the Spectrum. The type of sensor is identified so that you know the type of material needed to trip the sensor. The three types used on the machine are:

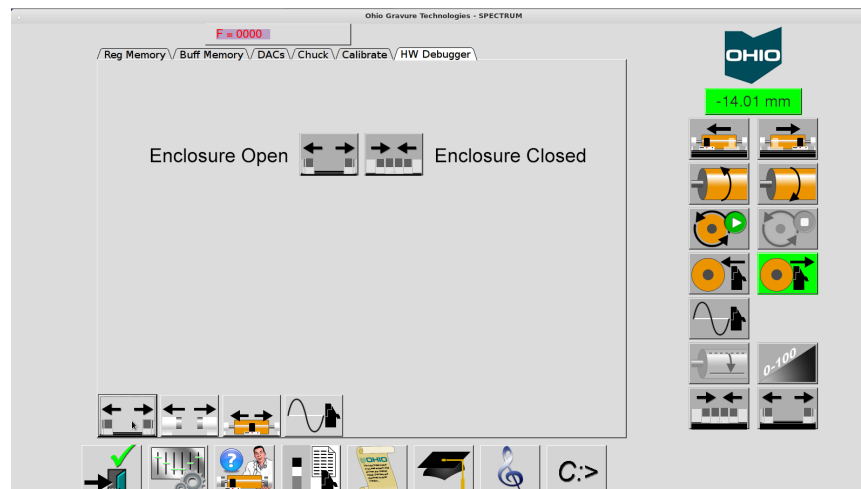
Electro-Magnetic Field – Emits a signal that is disrupted by magnetic materials, like steel and iron. This disruption is recognized by the sensor. For electro-magnetic sensors, a screwdriver blade or a knife blade should be used to verify operation.

Ultrasonic – Transmits and receives a sound “wave”. The wave reflects off any type of surface and returns to the sensor, which detects the returned signal. For ultrasonic sensors, something as simple as your finger can be used to verify the sensor operation.

Optical – Consists of two pieces, one an emitter and the second a receiver. Light from the emitter reflects off of a surface and is seen by the receiver. Optical sensors are used on the End-Seeking detectors.

Note: The operation of each sensor can be verified by using the particular feature it is related to. A second method, where possible, is also explained for each. For example, the enclosure sensors can be verified by opening or closing the enclosures. They can also be tested by placing your finger in front of the ultrasonic sensors.

Enclosure Diagnostics



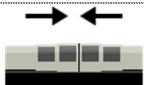
Select the Enclosure button to display the Enclosure Diagnostics group. There are two sensors in this group and one of these two should always be ON, unless the enclosures are stopped in the middle of travel.



Enclosure Open – Active when the enclosures are fully open. Found on the back of the machine by the electronics enclosure.

Ultrasonic

With enclosures closed, verify operation by placing your finger or other flat item in front of the sensor and watching the indicator. Can also be verified using the Enclosure Open button.

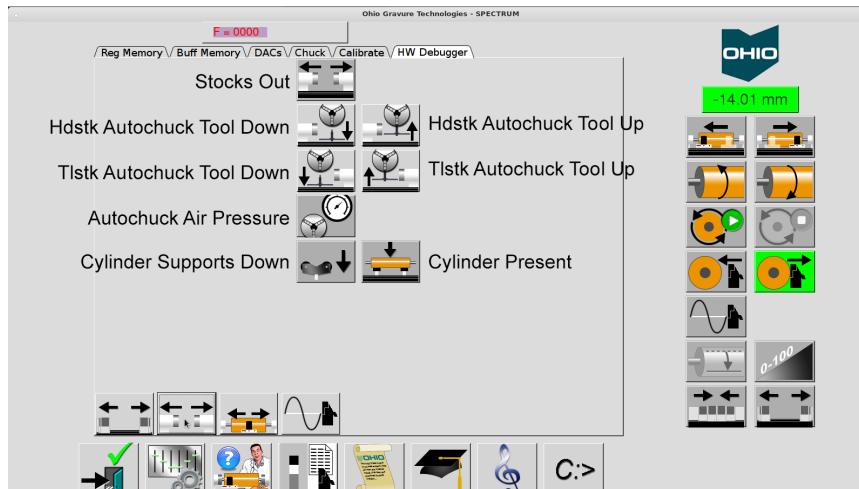


Electro-Magnetic

Enclosure Closed – Active when the enclosures are fully closed. Found on the back of the machine where the enclosures come together.

With enclosures open, verify operation by placing your finger or other flat item in front of the sensor and watching the indicator. Can also be verified using the Enclosure Closed button.

Stocks Diagnostics



Select the Stocks button to display the Stocks Diagnostics group. There are eight sensors in this group.

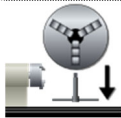


Electro-Magnetic

Stocks Out – Active when the headstock and tailstock are moved to their widest spacing. Can be found either at the tailstock end of the machine on earlier machines or the headstock end on later machines. The bellows must be freed to expose the sensor.

Check operation by placing a ferrous item in front of or above the sensor.

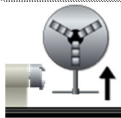
Note: The stocks must be moved by the operator using the Stocks Open button on the display or rear control panel. Using the Home Stocks buttons will not activate the sensor.



Electro-Magnetic

Headstock Autochuck Tool Down – Active when the chuck tool is retracted and clear of the autochuck. This should never be active when the Headstock Autochuck Tool Up sensor is active.

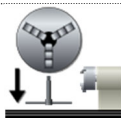
Check operation by placing a ferrous item in front of the sensor.



Electro-Magnetic

Headstock Autochuck Tool Up – Active when the chuck tool is inserted into the chuck. This should never be active when the Headstock Autochuck Tool Down sensor is active.

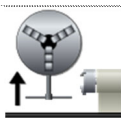
Check operation by placing a ferrous item in front of the sensor.



Electro-Magnetic

Tailstock Autochuck Tool Down – Active when the chuck tool is retracted and clear of the autochuck. This should never be active when the Tailstock Autochuck Tool Up sensor is active.

Check operation by placing a ferrous item in front of the sensor.



Electro-Magnetic

Tailstock Autochuck Tool Up – Active when the chuck tool is inserted into the chuck. This should never be active when the Tailstock Autochuck Tool Down sensor is active.

Check operation by placing a ferrous item in front of the sensor.



Autochuck Air Pressure – Active when air pressure is correct for autochuck operation.

Check by disconnecting the air supply from the rear of the machine.



Electro-Magnetic

Cylinder Supports Down – Active when the cylinder supports are lowered and in the retracted position and clear of the cylinder. Found on the headstock side support, near the support base.

Check operation by placing a ferrous item in front of the sensor. This sensor should never be active when the Cylinder Present sensor is active.

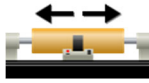
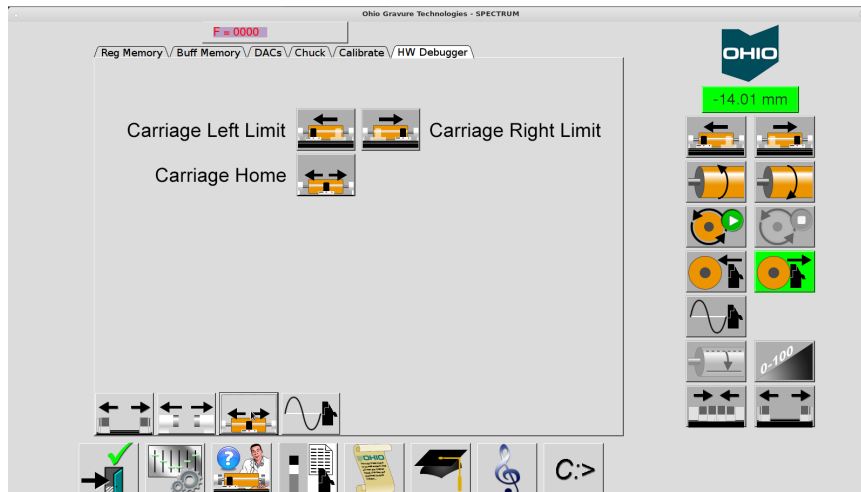


UltraSonic

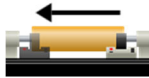
Cylinder Present – Active when a cylinder is resting on the supports. Found on the tailstock side support, facing up through the support block.

Check operation by placing a finger or other object in front of the sensor.

Carriage Diagnostics



Select the Carriage button to display the Carriage Diagnostics group. There are three sensors in this group.



Carriage Left Limit – Active when the carriage is moved to the far left and stopped to prevent collision with the headstock. Found under the headstock side of the carriage.

Electro-Magnetic

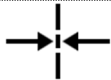
Check operation by placing a ferrous item in front of the sensor or by moving the carriage to the left-most position.



Carriage Right Limit – Active when the carriage is moved to the far right and stopped to prevent collision with the tailstock. Found under the tailstock side of the carriage.

Electro-Magnetic

Check operation by placing a ferrous item in front of the sensor or by moving the carriage to the right-most position.

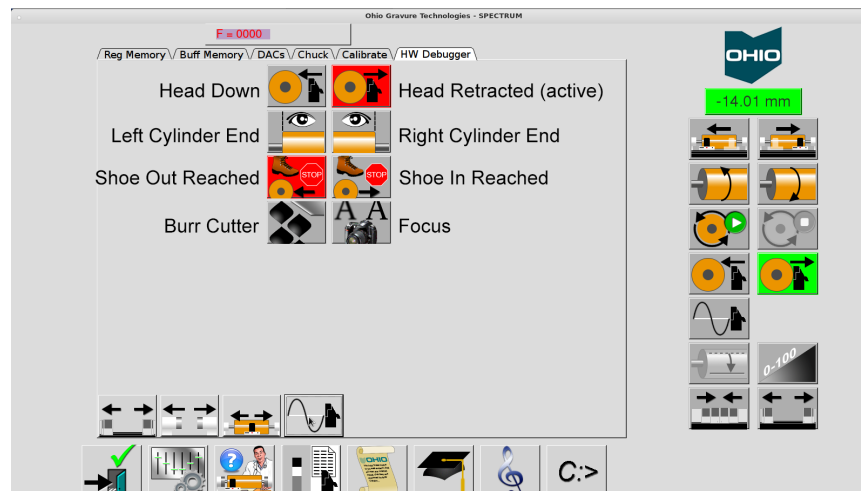


Carriage Home – Active when the carriage is positioned at the Home location in the center of the machine.

Electro-Magnetic

Check operation by placing a ferrous item in front of the sensor or by using the Home function.

Engrave Head Diagnostics



Select the Head button to display the Engrave Head Diagnostics group. There are eight sensors in this group.



Head Down – Active when the engrave head is lowered against the cylinder. Found behind the engrave head on the back left corner of the sub-carriage.

Electro-Magnetic

Check operation by lowering the head against a cylinder or pulling back gently on the head while it is lowering. Watch the indicator light to verify.



Head Retracted – Active when the engrave head is fully retracted from the cylinder. Found on the carriage at the back of the engrave head travel.

Electro-Magnetic

Check operation by placing a ferrous item in front of the prox or by fully retracting the head. Watch the indicator light to verify.



Optical

Left Cylinder End – Active when the left end-seeking sensor is detecting the cylinder.

Should become inactive when the sensors moves off the cylinder surface. Found on the pier mounted on the left side of the engrave head.

Check operation with a cylinder installed and the head at the Head Up position (minimum retract), not Head Retracted (fully back). Move the carriage to the left over the cylinder end until the indicator lights.



Optical

Right Cylinder End – Active when the right end-seeking sensor is detecting the cylinder.

Should become inactive when the sensors moves off the cylinder surface. Found on the pier mounted on the right side of the engrave head.

Check operation with a cylinder installed and the head at the Head Up position (minimum retract), not Head Retracted (fully back). Move the carriage to the right over the cylinder end until the indicator lights.



Shoe Out Reached – Active when the motorized shoe has moved to the farthest position from the head. This is the equivalent of decreasing the cell size until the shoe can no longer move. Found on the shoe motor drive.

Electro-Magnetic Verify the shoe out sensor works by moving the shoe from the Vista Tools page.
Check by repeatedly moving the shoe -50 until the sensor is reached and further travel is prevented. Keep track of the total moves and return to the starting point when finished.



Shoe In Reached – Active when the motorized shoe has moved to the closest position to the head. This is the equivalent of increasing the cell size until the shoe can no longer move. Found on the shoe motor drive.

Electro-Magnetic Check by repeatedly moving the shoe +50 until the sensor is reached and further travel is prevented. Keep track of the total moves and return to the starting point when finished.



Burr Cutter – Active when the burr cutter is moved to the Home position. This happens during burr cutter positioning. Found on the top of the engrave head.

Check operation by placing a ferrous item between the prox and the burr cutter yoke.

Electro-Magnetic



Focus – Active when the focus motor moves the camera ssembly to the start (home) position of the focus routine. Found on the camera assembly between the camera tube and focus motor.

Electro-Magnetic Check operation by placing a ferrous item under the focus prox.



Using the Vital Proof System™

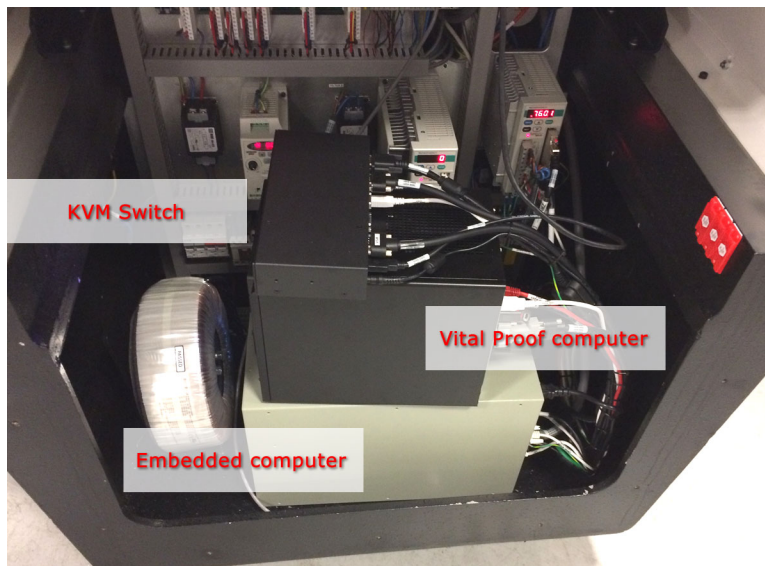


Introduction

The Vital Proof Multi-Color System is a hardware and software option that can be purchased for a Spectrum or Prism Prime engraver. It is also possible to upgrade an HS engraver to use Vital Proof.

With this system, you can compare the engrave data to the original Collage data and verify that it is correct. The intention of the Vital Proof System is to reduce the need to pull a press proof.

The Vital Proof System adds another computer, in addition to the usual embedded computer. Both are located inside the electronics area of the engraver.



The Vital Proof computer includes its own dongle. The embedded computer has a separate dongle.

When the embedded computer is turned on or off, the Vital Proof computer also automatically turns on or off.

Toggling Between Engrave Interface and Vital Proof

The engraver's monitor is shared between the normal engraver interface and the Vital Proof interface. That is, the monitor will show either the engraver interface or the Vital Proof interface but not both at the same time.



Change between the two display using the buttons on the switcher attached to the engraver below the monitor.

Press button 1 to see the engraver display.

Press button 2 to see the VP display.

Note: Buttons 4 and 3 do nothing.

Using the Vital Proof System

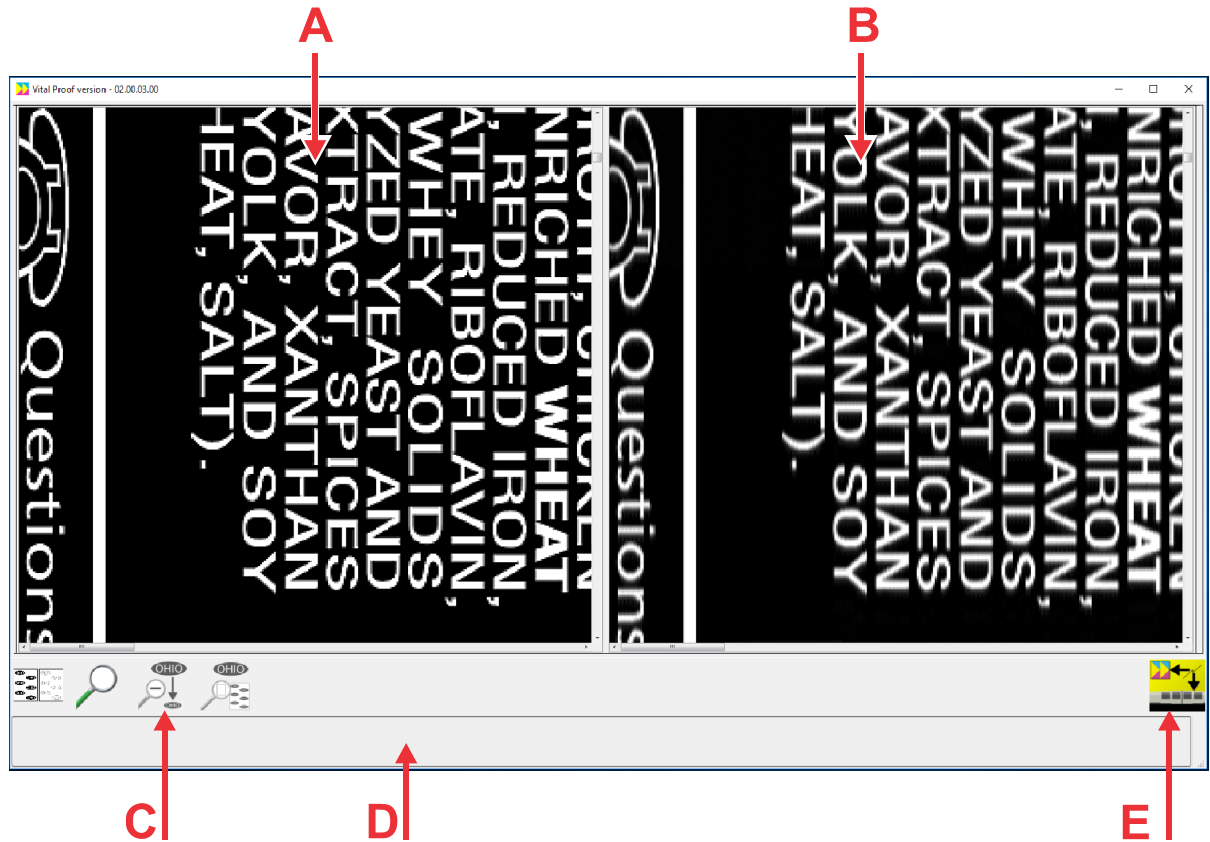
To use the Vital Proof System.

1. Load a job as usual.
2. Perform test cuts as usual.
3. Start the engraving.
4. Press the button to switch to the Vital Proof view.

The Parts of the Vital Proof Interface

The Vital Proof window has three areas:

The left pane (A), the right pane (B), and the tool bar (C)



- A** Collage View – In this pane, the image from the Collage job that is sent to the engraver is displayed.
- B** Proof/Difference Data – This pane displays either the engrave data (Proof Data) or the Difference Data. This is the difference between the Collage image and the engrave data.
- C** The toolbar. (see below).
- D** This area shows: The Mean of the Difference data; the Standard Deviation of the Difference data.
The progress bar displays the progress of job loading or engraving. It displays both a green bar and a percentage
- E** The Status Icon, showing the state of the machine

About the Panes

The two panes are synced together. As data is engraved, both panes display the same thing. That is, the graphics in both panes will build (from left to right) as the engraver engraves each rev of data.

When you zoom or pan, the display changes in both panes.

The Main Buttons

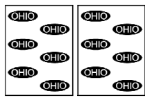
The buttons on the window change depending on current action.



A **B** **C** **D**

- A** Proof/Difference toggle
- B** Zoom/Pan toggle
- C** Zoom Out
- D** Zoom to top level

Display: Proof Data



Proof data is displayed in the right pane.

Touch the button to toggle to Difference data.

Display: Difference Data



Difference data is displayed.

Touch the button to toggle to Proof data.

Panning



You can pan (move) the image. Touch & hold inside either pane and move your finger. Both sides of the display pan together.

Touch the button to toggle to Zoom mode.

Zoom In



Zoom in by drawing a box around the area of interest. You can zoom multiple times. Both sides of the display zoom in together.

Touch the button to toggle to Pan mode.

Zoom Out



Touch the button to zoom out to the previous display. If you had zoomed in multiple times, you can zoom out multiple times.

This button is grayed out when display shows the whole image.

Zoom to the whole image

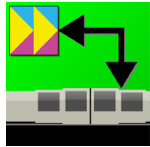


Touch the button to view the whole image.

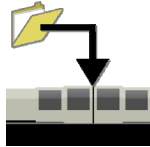
This button is grayed out when display shows the whole image.

Status and Errors

The bottom right corner displays machine status.



The Embedded computer is connected to the Vital Proof computer



The job is downloading



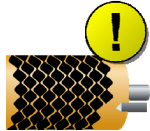
The job has successfully downloaded



Test cuts in progress



Engraving in progress



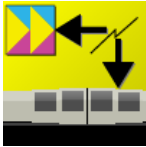
Engraving did not complete



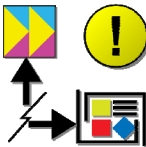
Engraving is complete



The engraver is in Inspect mode



The Embedded computer is not connected to the Vital Proof computer



The Collage computer is not connected to the Vital Proof computer.

Errors will display next to the status icon.



General error



Broken stylus – The stylus may be broken. This is only a warning! Engraving will continue until the operator performs an action such as going into Inspect mode or stopping the engraving.

Birth Certificate

When the engraving is complete, Vital Proof creates a birth certificate named `_vp.pdf` in `\vplogs\archive`. This birth certificate is automatically sent to the embedded computer to be combined with its own cylinder birth certificate.

Using the Vital Proof Viewer

Use the Vital Proof Viewer to view all separations of the job together. Just like with Collage, you can zoom up/down, show/hide separations, and print to a networked device.

The Vital Proof Viewer does not run on the engraver. Instead, it can be run on any Windows computer that is connected to the same network as the engraver and the Collage computer. For example, the VP Viewer can be set up on a Windows computer used by the quality control person. The VP Viewer must be configured correctly.

1. On the computer with the VP Viewer, click the desktop icon to open the program.
2. Click the file open icon.
3. Select a job from the directory that displays and click OK.

Refer to the online help for information on using the Viewer. Please note that once opened, the Vital Proof Viewer and the Collage Job Viewer are the same.

Index

1

1-Rev, Float 75

A

About

Cylinders 5
Jobs 5
Test cuts 5

AC/Vacuum On/OFF 74

Air Filters, Engrave Head 136

Arbors

Inserting into AutoChucks 82
Removing from AutoChucks 82

Auto focus, Vista page 97

AutoChucks

Arbors/cones 82
Locating 80

B

Birth Certificate 145

Burr cutter, Vista Calibration page 98

About 127

Alignment 128

Alignment menu 99

Installation 128

Move 99

Offset 99

Part number 127

Pivot pin 132

Setup hints 130

C

Calibration, Vista page 93

Camera

Horizontal alignment 140
Horizontal position 98
Rotation/Vertical alignment 142

Carriage left/right 73

Carriage limits, Mechanical 62

Carriage position

Cancel engrave limit 73
Go to 73
Menu 72
Set engrave limit 73
Zero 73

Cell setup page 85

Cell wall 85

Change values 86

Channel width 85

Clear displayed values 88

Find test cut 87

Highlight cell 85

Image drop 87

Learn screen 88

Measured values 86

Perform test cuts 87

Scum dot 86

Shadow cell 85

Target values 86

Tip cal 87

Changing engraving speed 78, 133

Cleaning the Cylinder 52

Cleaning the Touchscreen 63

Close		Cylinder handling page.....	79, 81
AutoChuck, Cylinder Handling page	80	Arbors, insert or remove	82
Covers	75	Autochuck, locate.....	80
Stocks, Cylinder Handling page.....	81	AutoChucks, Open/Close.....	80
Color changes		Cones, insert or remove	82
Buttons	68	Cylinder supports, raise/lower	80
Windows	67	End seeking	82
Common action buttons	72	Home carriage	79
AC on/off.....	74	Home stocks.....	81
Carriage left	73	Keyway detect	81
Carriage right	73	Open/Close stocks.....	81
Covers close	75	Resume semi-automation	82
Covers open	75	Run semi-automation.....	82
Float 1 rev	75	TIR measurement	82
Head in.....	74	Cylinder length measuring, part of End-Seeking.....	82
Head retract.....	74	Cylinder Rotation	74
Jog down.....	74	Cylinders, about	5
Jog up.....	74		
Mid-Tone Correction	75	D	
Start cylinder rotation.....	74	Dashboard	145
Stop cylinder rotation	74	Basic Information	147
Vacuum on/off.....	74	Birth Certificate	145
Cones		Daily Window Information	147
Inserting in AutoChucks	82	Email Tab	149
Removing from AutoChucks	82	General Tab	149
Constant tone engraving		Schedule Tab	149
Manual.....	54	Settings.....	148
QuickCell	56	Using.....	146
Continue button.....	76	Weekly/Monthly Information	148
Converge		Diagnostics	151
EasyCell with Engrave Automation	29	Autochuck air pressure	155
EasyCell with Semi-Automation.....	21	Burr cutter	158
EasyCell with Semi-Automation and Cylinder		Carriage home	156
Supports.....	25	Carriage left limit.....	156
QuickCell with Engrave Automation	37	Carriage right limit.....	156
QuickCell with Semi-Automation.....	33	Cylinder present	155
Vista page	93	Cylinder supports down	155
Currents		Enclosure closed.....	153
Balance currents	101	Enclosure open.....	153
Black current.....	100	Focus	158
White current	100	Head down	157
Cursors		Head retracted	157
Moving, Vista page	92	Headstock autochuck tool down.....	154
Select, Vista page.....	92	Headstock autochuck tool up.....	154
Vista page	91	Left cylinder end.....	157
Customer Support.....	2	Right cylinder end	157
		Shoe in reached.....	158

Shoe out reached.....	157	Select source	108
Stocks out	154	Toggle job list	107
Tailstock autochuck tool down	154	Total time	113
Tailstock autochuck tool up.....	154	Unselect job	110
Diamonds.....	123	Engraving	
Burr cutter	127	Frequency.....	67
Burr Cutter Installation	128	Speed	3
Shoe	123	Engraving a Job	
Shoe Installation	123	EasyCell Converge with Engrave Automation	29
Stylus	125	EasyCell Converge with Semi-Automation.....	21
Stylus Installation.....	125	EasyCell Converge with Semi-Automation and Cylinder Supports.....	25
Display engraved cylinder/jobs	107	Manual Setup	41
E		QuickCell Converge with Engrave Automation	37
EasyCell		QuickCell with Semi-Automation	33
Engraving with Engrave Automation	29	Engraving status.....	113
Engraving with Semi-Automation.....	21	Engraving rev.....	113
Engraving with Semi-Automation and Cylinder Supports.....	25	Remaining time	113
QuickCell manual assist	22, 26, 30	Total time	113
EasyCell to QuickCell converge, Vista page	96	Entering values with the numeric keypad.....	69
Embedded PC	5	Erase functions, Learn table	
End-Seeking,Cylinder Handling page	82	Erase all entries.....	116
Engrave Head		Erase one entry	116
Air filters	136	Exit buttons	75
Diamonds.....	123	Exit Software	121
Frequency override.....	133	F	
Operation.....	123	Find Test Cut	87
VISION 3.....	3	Float 1 Rev.....	53
Engrave limit		Button	75
Cancel	73	Using	53
Clear.....	73	Flowchart	
Set.....	73	Engraving a Job	
Engrave page	106	EasyCell with Engrave Automation	32
EasyCell test cut.....	111	EasyCell with Semi-Automation	24
Engrave start.....	111	EasyCell with Semi-Automation and Cylinder Supports	28
Engrave stop	112	Manual process.....	44
Engraving rev	113	QuickCell with Engrave Automation	40
Engraving status	113	QuickCell with Semi-Automation	36
Job notes.....	110	Focus, Vista Calibration page	
Preview	18, 110	Manual	137
QuickCell test cut.....	111	Move Distance	98
Real-Time video	113	Move In	98
Refresh.....	108	Move Out	98
Remaining time.....	113	Frequency Override	133
Run Semi-Automation	111	Front carriage control panel	8
Select job	106		

G

Gap / Cell Height 90
 Go to position 73

H

Hardware debugger
 Autochuck Air Pressure..... 155
 Burr Cutter 158
 Carriage diagnostics 156
 Carriage home 156
 Carriage left limit 156
 Carriage right limit 156
 Cylinder Present..... 155
 Cylinder Supports Down 155
 Enclosure Closed 153
 Enclosure diagnostics..... 153
 Enclosure Open..... 153
 Engrave head diagnostics 157
 Focus 158
 Head Down 157
 Head Retracted 157
 Headstock Autochuck Tool Down 154
 Headstock Autochuck Tool Up..... 154
 Left Cylinder End..... 157
 Right Cylinder End..... 157
 Shoe In Reached 158
 Shoe Out Reached 157
 Stocks diagnostics 154
 Stocks Out..... 154
 Tailstock Autochuck Tool Down..... 154
 Tailstock Autochuck Tool Up..... 154
 Hardware debugger, What it does 151
 Head in 74
 Head retract..... 74
 Home carriage, Cylinder Handling page 79
 Home Stocks 81

I

Image Drop
 Cell setup page..... 87
 For production cylinders 53
 For test cuts only 53
 Screen page 78
 Using 53

J

Job list
 Black text – New Jobs 107
 Grey text – Engraved Jobs 107
 Toggle 107
 Job notes 110
 Jobs, about 5
 Jog cylinder up/down 74

K

Keypad
 Accepting values..... 69
 Clearing values 69
 Correcting values..... 69
 Entering values 69
 Keyway detect 81

L

Learn table 115
 Erase all entries 116
 Erase functions 116
 Erase one entry 116
 Learn a screen 88
 Light calibration, Vista page 97
 Live video, Vista page 93
 Loading a cylinder 45
 Auto-chucks with the operator display 47
 Chucks with the operator display 46
 Cones with rear controls 48
 Cones with the operator display 46
 Manual chucks with rear controls 48
 Operator display..... 45
 Rear controls 47
 Locate AutoChuck, Cylinder Handling page 80
 Lock stocks, Cylinder Handling page 81
 Lower supports, Cylinder Handling page 80

M

Machine controls 6
 Front carriage control panel..... 8
 Move Carriage 8
 Operator display..... 7
 Power disconnect switch..... 6
 Power on button 7
 Rear panel 9
 Touch pad..... 8

Machine Log 114

Manual Assist, EasyCell Converge 26, 30

Manual engraving

- Constant tone 54
- Constant tone, QuickCell 56

Measure

- Allowed current imbalance 3.5 Amps..... 101
- Balance currents 101
- Black current..... 100
- Cells, Vista page 58
- Currents Page 100
- Functions, Vista page..... 89
- Read currents 101
- White current 100

Mechanical carriage limits 62

Mid-Tone Correction 75

- 3-Point Curve Example 104
- 4-Point Curve Example 105
- Change values..... 103
- Clear displayed values 103
- Enabled 103
- Find test cut 103
- Measured values..... 103
- Page 102
- Perform test cuts 103
- Target values 102
- Test block values..... 102

Moving from page to page 70

O

Open

- AutoChuck, Cylinder Handling page 80
- Covers 75
- Stocks, Cylinder Handling page..... 81

Operator display 7, 65

Operator pages

- Action buttons 66
- Introduction 66
- Status 66
- Text box 66

P

- Page buttons 70
- Perform Load button..... 83
- Perform Test Cuts 87
- Perform Unload button..... 83
- Position Gauge, Stylus..... 126
- Power disconnect switch 6
- Power On button..... 7
- Previewing selected job 18, 110

Q

QuickCell

- Assist EasyCell Converge 22
- Continue button 96
- Engraving with Engrave Automation 37
- Engraving with Semi-Automation 33
- Restart button 96
- Restarting 96

R

- Raise supports, Cylinder Handling page..... 80
- Read Currents 101
- Real-Time Interface..... 5
- Real-Time Video, Engrave page 113
- Rear panel 9
- Refresh, Engrave page 108
- Removing stylus for tracking life 117
- Reset Carriage Position 73
- Restart

 - Button 76
 - Embedded computer 12, 121

- Restarting

 - QuickCell 96

- Resume semi-automation, Cylinder Handling page.... 82
- Run semi-automation, Cylinder Handling page 82

S

Safety

- Cylinder loading/unloading..... 4
- Hearing protection 4
- Information 4
- Pinch points..... 4
- Rotational hazards 4
- Save image, Vista page..... 93

Screen page 77

- Cylinder Circumference 77
- Cylinder Diameter 77
- Frequency override 78
- Image drop 78
- Raster 77
- Screen 77
- Screen Angle 77
- Stylus Angle 78

Scum dot, Cell Setup page 86

Select

- Job source, Engrave page 108
- Job, Engrave page 106

Setting Image Drop 53

Shoe

- About 123
- Installation 123
- Move, Vista Calibration page 98
- Part number 123

Shutdown, Embedded computer 121

Start

- Converge, Vista page 94
- Cylinder rotation 74
- Engrave, Engrave page 111
- Mid-tone 95

Status

- Icon 67
- Information 67
- Line 67

Stop

- Cylinder rotation 74
- Engrave, Engrave page 112

Stylus

- About 125
- Angles 125
- Color Code 125
- Installation 125
- Part number 125
- Position Gauge 126

Stylus life table 116

- Adding a stylus 117
- Information table 116
- Removing a stylus 117
- Selecting a stylus for tracking 117

T

- Test cuts, about 5
- Tip Cal, Cell Setup page 87
- TIR Measurement, Cylinder Handling page 82
- Toggle job list 107
- Touch pad 8
- Touchscreen *See Operator display*
- Truing a cylinder 52
- Tune Page 119
- Turning off
 - Complete power down 12
 - Machine and PC 12
 - Machine only 12
- Turning on
 - Cold start 11
 - Warm start 11

U

- Unloading a cylinder 49
 - Cones with rear controls 51
 - Cones with the operator display 49
 - Manual chucks with rear controls 51
 - Manual chucks with the operator display 50
 - Rear controls 51
- Unlock stocks, Cylinder Handling page 81
- Unselect job, Engrave page 110

V

- Vacuum
 - Bag replacement 135
 - On/OFF 74
- Video Display Area, Vista page 89
- View
 - Channel 95
 - Heavy mid-tone 95
 - Highlight 95
 - Light mid-tone 95
 - Nested full 94
 - Stripe full 95
- VISION 3 Specifications 3

Vista	
Auto focus.....	97
Cell height measure	90
Changing target sizes	90
Continue QuickCell	96
Converge.....	93, 94
Converge methods	60
Cursor controls	91
Cursor movement.....	92
Cursor select	92
EasyCell to QuickCell.....	96
Engraving with EasyCell	21
Gap measure.....	90
Light calibration	97
Live video.....	93
Manual focusing	137
Manually measure a Cell or Channel	58
Measure functions.....	89
Page	89
Perform test cuts	93
Restart QuickCell	96
Save image	93
Start converge	94
Start mid-tone	95
Video display area	89
Vista calibration	93
Vista Calibration	
Aligning	139
Burr cutter.....	98
Camera horizontal position.....	98
Focus distance.....	98
Magnification calibration	143
Move focus in.....	98
Move focus out	98
Page.....	97
Shoe move	98
Y	
Yes, No buttons	76
Z	
Zero position	73

