



Automated Sandblast Production Systems





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This document is designed to be compatible with build 69 of the QuickSand software.
Other versions of QuickSand software may show minor differences in menus.

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Limited Warranty Agreement

ALLEN DATAGRAPH QuickSand Automated Sandblast Production Systems are warranted to be free of defects in both materials and workmanship. Should any part of this equipment be defective, it will be repaired or replaced, at the option of the manufacturer, at no charge for parts or factory labor for a period of one (1) year from the date of installation. All warranty services are performed at the Allen Datagraph factory. Replacement parts not installed at the factory will be billed to the customer at regular prices and credit will be issued when the defective parts are returned. The customer is responsible for freight on warranty parts and repairs.

This warranty is void if:

1. The equipment has been damaged by negligence, accident or mishandling, or has not been operated in accordance with the procedures described in the operating instructions;

or:

2. The equipment has been altered or repaired by other than an approved service station or factory service center, or adaptations or accessories have been attached to the equipment that shall have adversely affected the performance, safety, or reliability of the equipment.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, APPLIES to the equipment. Allen Datagraph does not assume any responsibility for consequential damages occasioned by the equipment, or inconvenience or interruption in operation.

In case of unsatisfactory operation, Allen Datagraph or its Dealer should be notified immediately.

Technical Support

Up to 4 hours of calls in technical support is available at no charge during the warranty period. Technical support is available during business hours based on Eastern Time Monday thru Friday. Technical support outside the limits stated will be billed at current rates.

For Technical support call: 603-893-1983

Installation

Installation of the QuickSand is preformed by Allen Datagraph or the dealer/distributor where you purchased the QuickSand. Installation by customer should not be attempted.

Warning: If you need to weld anything on to the frame of the machine make sure
Remove circuit boards and remove motor fuses

Connect Power Cord

The QuickSand product requires specialized installation in order for the limited warranty to remain in effect, ask your dealer or contact technical support at Allen Datagraph for details.

Power Connection

Important Note: Use of a HIGH QUALITY surge protector (1000 watts) is REQUIRED by Allen Datagraph Systems. Failure to do so could affect your warranty coverage if a problem arises due to improper power connection.

CAUTION: The power cords are a three-conductor cable that incorporates a safety (earth) ground connection. For the machine to operate safely and correctly, the power cord *must* be plugged into an outlet that has an earth ground contact. *Never* plug the power cord into a two-prong outlet by using a 3=2 cord adapter.

The QuickSand only runs from 115V AC 48-66 Hz.

Computer Connection

System Interfacing

All Allen Datagraph products utilize serial (RS-232) interface or optionally USB (universal serial bus) interface. Use of the USB requires a USB to Serial converter. The recommended USB to serial converters are described in TSB Title: Recommended USB devices [Web Site Copy](#) / [CD Copy](#) on the technical support page of the Allen Datagraph web site.

The serial interface is factory preset for 9600 baud, no parity, 8 data bits, 1 stop bit. The QuickSand, when used with the supplied plotter cable, automatically supports HARDWARE handshaking and requires the special cable to be used only available from Allen Datagraph.

Connect the plotter cable supplied with the QuickSand to serial port and to the communications port on the host computer. Because of the bi-directional communications required by the QuickSand system the use of the supplied communications cable and one of the com ports or the recommended USB to Serial on the host computer.

Loading Allen QuickSand Software

The Firmware Utility CD contains:

1. The QuickSand Interface Utility program for communication with the QuickSand.
2. A current revision of firmware.

"Firmware" is software that controls the machine functions. ***The firmware on this disk is provided for update purposes only and should not be installed on new machines.***

3. Manual and sample jobs.

In order to use the QuickSand, it is necessary to install the Remote Panel Utility Program.

To install and run the Remote Panel Utility program - Open Windows Explorer by right clicking on the Start Button. Find the CD-ROM drive and find the setup file SetupSandBlastXX.EXE (the XX reflects the numeric version number of the software and firmware). Run the setup program by double clicking on the file. Follow the onscreen prompts.

Installing Firmware

The firmware on this disk is provided for update purposes only and should not be installed on new machines. In general you should not install a firmware update unless directed by a member of the technical support staff. Firmware updates are available on the technical support page of the Allen Datagraph web site at <http://www.allendatagraph.com>.

This procedure details the firmware upgrade procedure. Normally firmware is only sent to customers when a software problem is reported that has been fixed in a later version of the software.

From time to time Allen Datagraph will recommend that you upgrade your firmware in your Allen Datagraph QuickSand. A file can be downloaded from the Allen Datagraph web site and saved to the desktop.

Before running the setup program be sure to exit the older version of the Remote Panel.

XP Instructions

The downloaded file is a .zip file. You can run the setup program just by double clicking on the *.zip file then double click on the setup *.exe file.

Other Windows Operating Systems

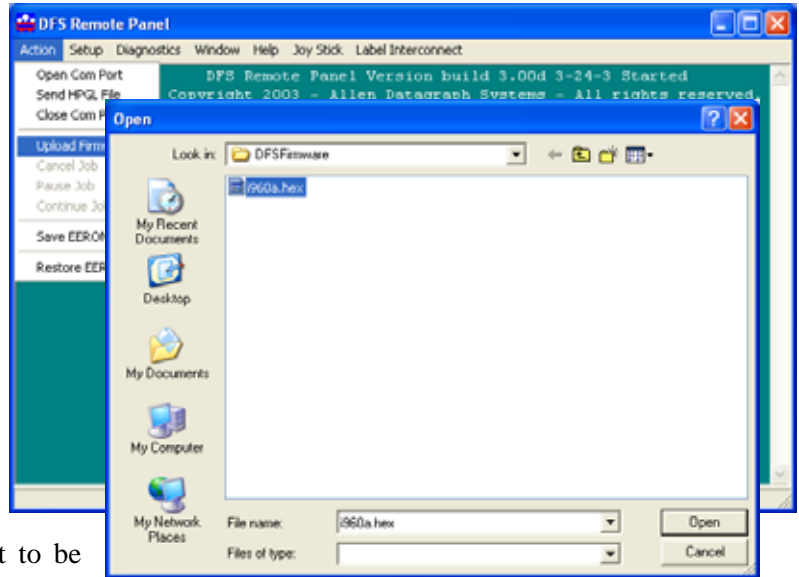
If you have not already installed Winzip on your computer, download and install the Winzip program from <http://www.winzip.com>. Then you can open the zip file by double clicking on it. Drag and drop the contents of the zip file to your desktop.

The setup program will run to install the Remote Panel and the firmware on your Windows computer. If instructed by the factory to upgrade your firmware, follow the firmware upgrade instructions below. If you were only instructed to upgrade to a new remote panel you have already completed this task and do not need to install the firmware.

Firmware Installation Instructions:

Do not use this section unless instructed to do so by Allen Datagraph.

Turn on the Allen Datagraph equipment to be upgraded and connect it to your computer with the supplied serial cable. Start the Remote Panel by clicking on start, All programs, Allen Datagraph, Sand Remote Panel. Click on Setup, Com Port and verify that the correct Com port has a check next to its name. Click on Setup, Other Parameters and select Menus Advanced, OK. Click on **Action, Upload Firmware**. Select I960a.hex file and click **Open**. If the upload fails, you will be given a backup procedure to follow on the computer screen.



Remote Panel

The Remote Panel program is used to address all QuickSand functions. It should be loaded onto the computer that is directly connected to the QuickSand.

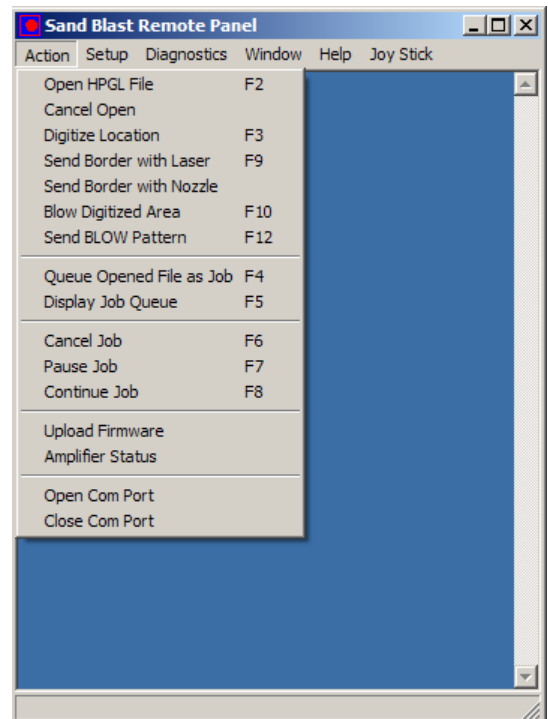
Remote Panel Functions

To start the remote panel double click on the icon on the desktop or click on Start -> All Programs-> Allen Datagraph -> Sand Remote Panel.

Action menu

Open HPGL File

This allows opening an image and displays a preview of the image on the screen. The program will analyze the HPGL



file and create a reduced set of paths to run the nozzle over. It then displays a simulation of the nozzle path.

Cancel Open

If you open a large HPGL file it can sometimes take a long time to process the file. This command can be selected while the program is analyzing the file and abort the open process.

Digitize Location

After opening the HPGL file you need to locate the monument within the blow area so that the program knows the location and the rotation of the monument within the sand room. The monument can be loaded rotated 90° if necessary to make it fit.

Send Border with Laser

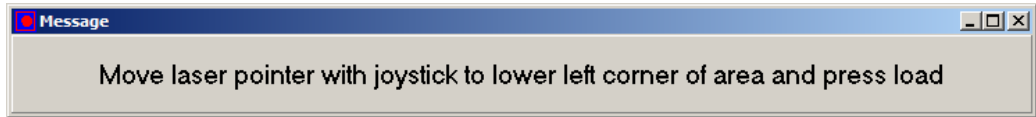
This command moves the laser point around the outside edge of either the border or the HPGL file opened or the border of the Digitized area.

Send Border with Nozzle

This command moves the nozzle point around the outside edge of either the border or the HPGL file opened or the border of the Digitized area.

Blow Digitize Area

This is the second way to run the program.



Selecting this menu item requests the lower left and the upper right corner of an area to blow. The program then generates an HPGL file that represents the rectangular area as defined by the lower left and upper right corners. After the request is made to digitize a point, move the head with the joystick until the laser point points to the selected corner and press the enter key on the pendant.

Send Blow Pattern

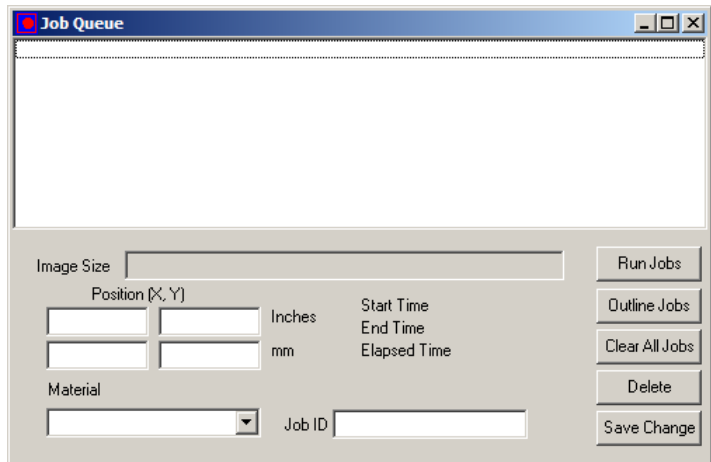
After opening the HPGL file and digitizing the location or defining a digitized area you can either send the job immediately or queue the job in the job queue. This command immediately starts the blowing operation.

Queue File As Job

You can queue up multiple jobs to be blown. The program display the size of the HPGL file in inches in x and y-axes. Clicking yes adds the opened image to the job queue where it was digitized.

Display Job Queue

The display job queue on the action menu displays a list of jobs in the queue. Clicking on the job name in the list at the top displays the parameters for that job.



Run Jobs

Clicking on Run Jobs, runs all the queued jobs.

Outline Jobs

Outline jobs, moves the nozzle assembly around the edge of each queued job.

Clear All Jobs

Removes all queued jobs from the queue.

Delete

To delete a job select the job to delete in the top list and click on delete to delete that job.

Save Changes

To make a change in a job parameter, select job to change in the top list, make the change in the edit boxes at the bottom of the screen and then click on save changes.

Image Size

Displays the size of the selected image.

Position

The location of the job from power up or last find origin. This value can be changed by clicking on the job that you want to change. Changing the value. Then click on Save Changes.

Material

This is the material selected for this image. The material select controls the number of passes other nozzle parameters. This value can be changed by clicking on the job that you want to change. Changing the value. Then click Save Changes. Note: some material parameters (e.g. scan line separation) are examined only when the image simulation is performed when opening the HPGL image. Changing the material in the job queue will not affect these parameters.

Job ID

This is an optional field if you turn on job id's on the Setup -> Com Port -> Select Model. This value can be changed by clicking on the job that you want to change. Changing the value. Then click on Save Changes.

Cancel, Continue, Pause Job

These commands will cancel, continue, or pause a job being sent. You can also use the pause switch on the pendant to pause the job. Note: pausing a job can cause a discontinuity in the image.

Upload Firmware

Should your firmware ever need to be updated, this command will locate the firmware file and send it to the QuickSand.

Amplifier Status

The violin power amplifiers used to control the motor have several status indications. This command will query the violin amplifier and display the amplifier status on the screen.

Open Com Port

Will initialize the communications port.

Close Com Port

Closes the communications port so that other programs can use the port. The remote panel program will automatically close the port in most instances when it is not actively communicating with the QuickSand.

Setup Menu

Main Menu

Firmware Version

Displays the model number, software part number and software version of the firmware loaded into the QuickSand. It should match the version displayed when you start the Sand Remote Panel.

Position

Displays the current position of the nozzle assembly. These values are measured from the power up initialization location.

Last Saved Error Message

If an error is detected that causes the system to shut down you can power off the QuickSand and power it back on and the error that occurred will be displayed here. This error message can be very old as it is saved until the next error message occurs.

Clear Error

Pressing the Clear Error button will clear the currently saved error message. This allows knowing that a displayed error occurred since the Clear Error button is pressed.

Save Setup

Clicking on Save Setup will save changes in parameters so that when you power on the machine the parameter will be remembered.

Cancel

Changes made to values are ignored and the menu is closed.

OK

Changes made to values are saved in the QuickSand until the QuickSand is powered off.

State Page

State

Pausing a job with the Action -> Pause will change the state to Pause state. You can resume the job with either Action -> Continue or bringing up the main menu, selecting ready and clicking on OK.

Pen Up Off

This parameter turns off the sand when a movement without blowing is made. If on the sand is turned off on straight-line moves. If off the sand is on from the moment it start moving until the end of the job.

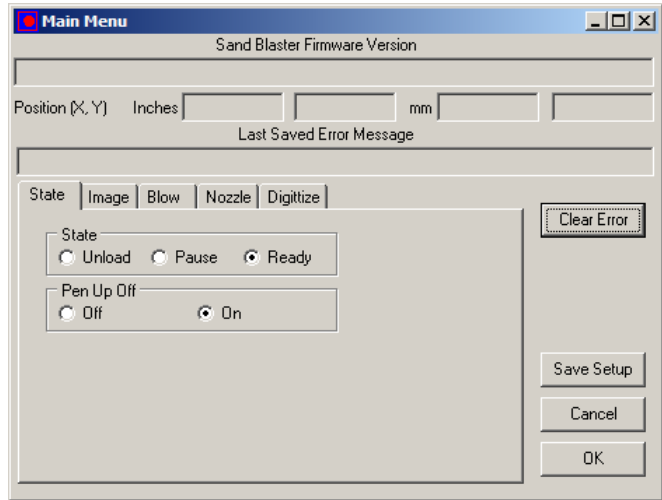


Image Page

Most of the parameters on this page act as defaults for a pen that has not been defined in the pen table.

Center Offset

When the machine is drawing its moving circles, this parameter controls how far the center of the circle shift left/right along the reduced fill line. This parameter is only used when there is no pen # defined in the pen parameter page.

State	Image	Blow	Nozzle	Digitize
Description	Range		Value	
Center Offset	0.1 - 1 Diameter/Rev		<input type="text" value="0.40"/>	
Image Multiplier	0.01 - 100		<input type="text" value="1.00"/>	
Radius	0.375 - 2 inches		<input type="text" value="0.750"/>	
Scan Line Separation	0.5 - 4 inches		<input type="text" value="1.180"/>	
Vertical Combine	0.18 - 2 inches		<input type="text" value="0.19"/>	
X Margin Overlap	-1.50 to 1.50 inches		<input type="text" value="0.00"/>	
Y Margin Overlap	-0.19 to 1.50 inches		<input type="text" value="0.00"/>	

Image Multiplier

Allows changing the size of an image read from an HPGL file. Some cad programs have a limit of the physical image size of the file. If you need to create an image larger than the limit this parameter would allow you to design the image at half size and then scale resultant image by a factor of two. Normally this value is set to one.

Radius

This parameter controls the radius of the blowing circle. This parameter is only used when there is no pen # defined in the pen parameter page.

Scan Line Separation

When creating the reduced scan lines this parameter controls the distance between scan lines. This parameter is only used when there is no pen # defined in the pen parameter page.

Vertical Combine

When creating the reduced scan lines the program needs to know how far from the scan line to look to eliminate duplicate scan lines. This parameter is only used when there is no pen # defined in the pen parameter page.

X Margin Overlap

This parameter allows controlling an overlap area to blow beyond the end of the reduced scan line. A value of 0 starts the center of the moving circle at the end point of the fill line. > 0 increases overlap. This parameter is only used when there is no pen # defined in the pen parameter page.

Y Margin Overlap

This parameter allows controlling an overlap area to blow beyond the bottom and the top of the blow rectangle. A value of 0 runs the first blow line along the border of the scan area. > 0 increase overlap. This parameter is only used when there is no pen # defined in the pen parameter page.

Blow Page

Most of the parameters on this page act as defaults for a pen that has not been defined in the pen table.

Acceleration

This parameter controls how fast the vectors reach final velocity. Suggested value 1

Move Speed

This is the speed at which the nozzle moves when it is not blowing. Suggested value is 15 cm/sec.

State	Image	Blow	Nozzle	Digitize
Description			Range	Value
Acceleration			1-4 (0.25 m/Sec/Sec)	<input type="text" value="1"/>
Blow Speed			1-30 (cm/sec)	<input type="text" value="22"/>
Extra Rotations			0.0 - 4.0 rotations	<input type="text" value="0.50"/>
Max Passes			1-Passes times	<input type="text" value="1"/>
Move Speed			1-30 (cm/sec)	<input type="text" value="22"/>
Pass offset			0 - 50 % radius	<input type="text" value="1"/>
Passes			0-30 times	<input type="text" value="1"/>

Blow Speed

When blowing sand this is the speed the nozzle moves in relation to the frame. Suggested value range is: 15-30. This parameter is only used when there is no pen # defined in the pen parameter page.

Extra Rotations

This parameter controls the number of extra rotations the nozzle does at the beginning and end of each blow line without moving the center. There will be at least this number of blow circles performed at the start and end of each blow line. Additional rotation is performed until the nozzle is heading in the correct direction. This parameter is only used when there is no pen # defined in the pen parameter page.

Max Passes

Normally you need multiple passes over a section of the monument to get enough of the monument blasted away. This parameter gives the sand blast mask time to cool off before another pass is performed. This parameter is only used when there is no pen # defined in the pen parameter page.

Pass Offset

The amount to offset a blow line on subsequent passes.

Passes

Total number of passes to perform. This parameter is only used when there is no pen # defined in the pen parameter page. Since sand blasting is sometime very deep it may take a number of passes of the nozzle over the stone to obtain the desired depth of cut.

Nozzle Page

Scale Blow Speed

As the nozzle is used it gets bigger. Use this parameter to adjust some

State	Image	Blow	Nozzle	Digitize
Description			Range	Value
Scale Blow Speed			0.3 to 3.0	<input type="text" value="1"/>
Scale Center Offset			0.3 to 3.0	<input type="text" value="1"/>
Scale Scan Line Separation			0.3 to 3.0	<input type="text" value="1"/>
<input type="checkbox"/> Percent / Factor				

of the blow speeds selected based on nozzle wear.

Scale Center Offset

As the nozzle is used it gets bigger. Use this parameter to adjust all of the center-offset speeds selected based on nozzle wear.

Scale Scan Line Separation

As the nozzle is used it gets bigger. Use this parameter to adjust all of the scan line separations selected based on nozzle wear.

Percent / Factor

Units of measure for nozzle degradation adjustments. If checked a multiplicative factor is used. If unchecked factors are % change.

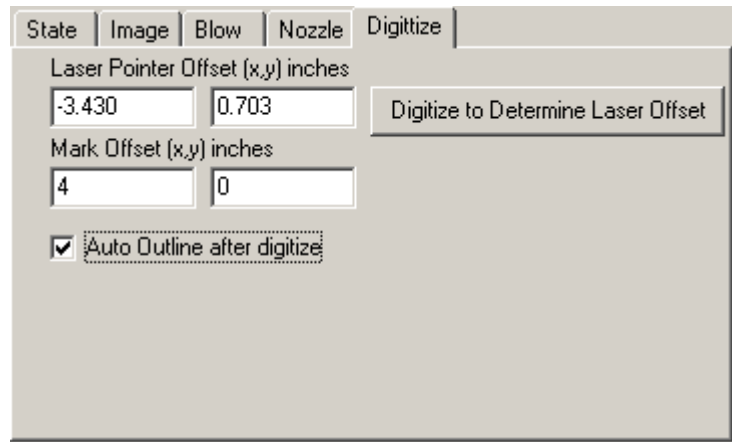
Digitize Page

Laser Pointer Offset

This is the distance between the nozzle and the laser pointer. See Digitize to Determine Laser Offset description below.

Mark Offset

An alignment tool is used that is offset in the x-axis by 4 inches since the corners of most monuments are not present. You line up the tool with the left edge and bottom of the monument and use the 4-inch offset to digitize the origin of the monument.

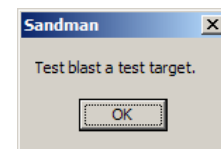


Auto Outline after Digitize

If this box is checked the QuickSand panel will move the nozzle around the outside edge of the monument after digitizing the origin and rotation. If unchecked this outline step is skipped.

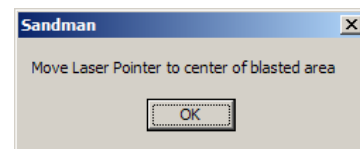
Digitize to Determine Laser Offset

This starts an automated procedure to determine the laser point offset. Place a dummy stone in front of the nozzle. Turn on the sand nozzle. After test blasting click on OK.



After clicking on OK the panel will then ask:

Using the joystick move the laser pointer to the center of the blasted area. Then click on OK on the second box. The panel will determine the laser pointer offset from the position of the machine on these two points.



Material Tree

The Material tree allows create new materials, Selecting which material are displayed, and arranging the material in a tree structure. To Add a material click the add button and type in a new name. To select which materials appear in the tree use the CTRL and SHIFT keys and the mouse and highlight all the materials you want to appear in the right box. To arrange the tree

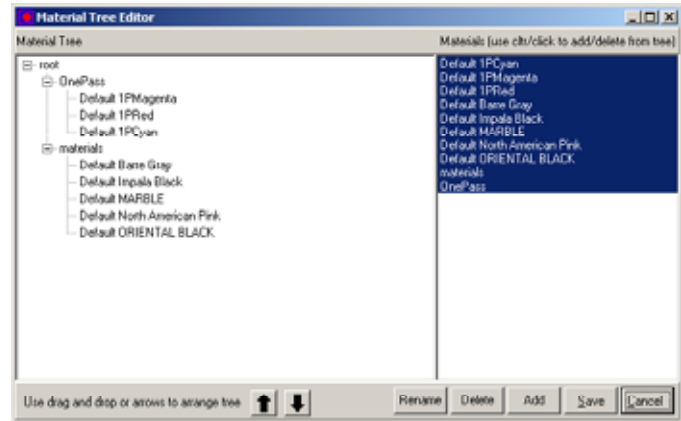
drag a material on the left side and drop it on the parent for the item or select an item and use the arrow buttons.

Rename

If you want to rename a material select the material on the left side and click Rename. Enter a new name for the material. It is recommended that you not use the material with the name Default as the parameters may be changed if you upgrade the firmware.

Delete

To Delete a material select the material on the left side and click delete.



Add

To add a material click on add. Enter the new name. Material will be added at the bottom of the tree. Use the drag and drop to place the item where you want it in the tree. Note: you can create tree nodes by creating a new material.

Save / Cancel

After making changes to the tree click on save to save your changes to the tree or Cancel to not make any changes to the tree. Select the material pens you want to edit before clicking on save or cancel.



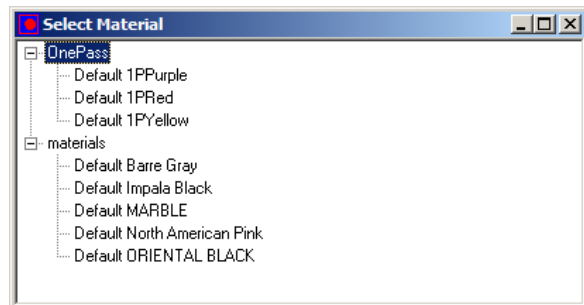
The up and down arrows allow moving the selected material up or down one position on the tree. Select the tree item you want to move and then click on the up or down arrow button.

Drag and Drop

You can also arrange the tree by moving the mouse over a material. Click and hold the left mouse button. Move the mouse to the new parent of the material to be moved and let go of the mouse button.

Selecting Material

When you open an HPGL file or Blow a digitized area, or click on Setup -> Material List the panel will display the current tree. To select a material click on the material you want to select and the click on the x in the top right corner to select the material.

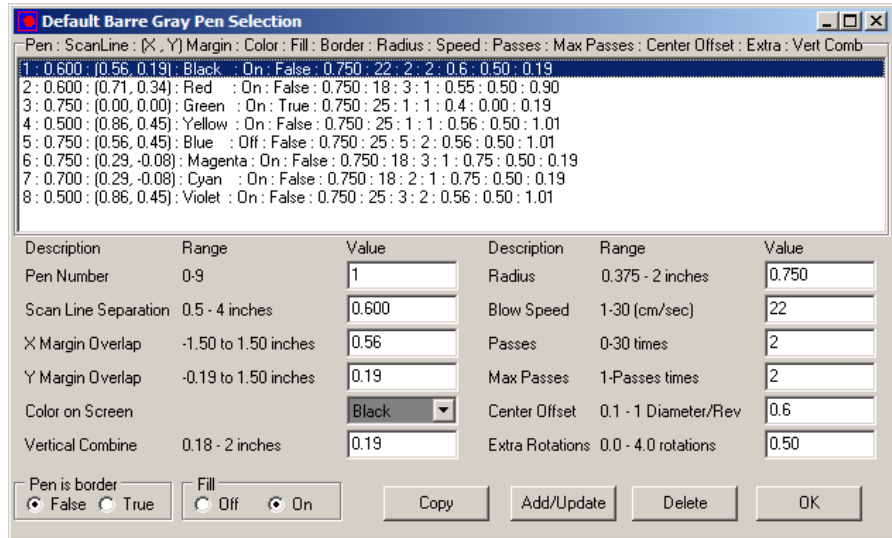


Material List / Pen Parameters











The material list/pen parameters allow selecting the action performed by the QuickSand when a select pen for the pen number is seen in the HPGL file. See pen numbers below.

Pen Number

This is the pen number for the parameters for each pen. Normally an HPGL file contains select pen commands to change the color of the output. The QuickSand remote panel uses these different colors to select the action performed. The Allen DirectCut Printer driver defines pen # to color as follows:



In order for colors to match to pens you must use RGB colors indicated below to match to pens. RGB Number (red, green, blue)

Pen 1  C_black.ico Black 0,0,0	Pen 2  C_red.ico Red 255,0,0	Pen 3  C_green.ico Green 0,255,0	Pen 4  C_yellow.ico Yellow 255,255,0	Pen 5  C_blue.ico Blue 0,0,255
Pen 6  C_megent.ico Magenta 255,0,255	Pen 7  C_cyan.ico Cyan 0,255,255	Pen 8  C_violet.ico Violet 115,0,204	Pen 9  C_brown.ico Brown 102,51,51	Pen 10  C_orange.ico Orange 255,102,0

All colors that are non-white and not closer to one of the above colors will map to bright yellow

Pen 11 Bright Yellow (255,255,254)

Pen 12 White (255,255,255) (no plot output)

If you want the HPGL file to use pen 3 you have to set the color of the line drawn in the CAD program used to create the HPGL file to Green. You must also have Multiple Pen Output in the DirectCut printer properties set to yes.

Scan Line Separation

When creating the reduced scan lines this parameter controls the distance between scan lines.

X Margin Overlap

This parameter allows controlling an overlap area to blow beyond the end of the reduced scan line. A value of 0 starts the center of the moving circle at the end point of the fill line. > 0 increases overlap.

Y Margin Overlap

This parameter allows controlling an overlap area to blow beyond the bottom and the top of the blow rectangle. A value of 0 runs the first blow line along the border of the scan area. > 0 increase overlap.

Color On Screen

This is the color the pen number appears as when displaying the simulation.

Vertical Combine

When creating the reduced scan lines the program needs to know how far from the scan line to look to eliminate duplicate scan lines. This is normally $\frac{1}{2}$ the scan line separation.

Pen is Border

Normally pen 3 / Green is set as the border pen. Only one pen can be defined as the border pen. A border is required for digitizing and locating the pen.

Fill

Pen 5 / blue is normally set for fill off. All other pens are fill on. When fill is off the blow pattern follows the line. This is normally used to blast an outline pattern.

Radius

This parameter controls the radius of the blowing circle.

Blow Speed

When blowing sand this is the speed the nozzle moves in relation to the frame. Suggested value range is 15-30.

Passes

Total number of passes to perform. Since sand blasting is sometime very deep it may take a number of passes of the nozzle over the stone to obtain the desired depth of cut.

Max Passes

Normally you need multiple passes over a section of the monument to get enough of the monument blasted away.

Center Offset

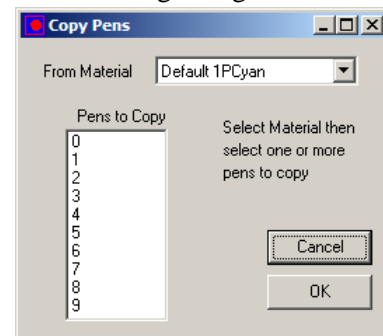
When the machine is drawing its moving circles, this parameter controls how far the center of the circle shift left/right along the reduced fill line.

Extra Rotations

This parameter controls the number of extra rotations the nozzle does at the beginning and end of each blow line without moving the center. There will be at least this number of blow circles performed at the start and end of each blow line. Additional rotation is performed until the nozzle is heading in the correct direction.

Copy

It is recommended that you not use any material starting with the work default. You should create or rename the default materials or create a new material with your own name. You



can then copy one of the existing color/pen setups using the Copy function. To copy pens select the material you want to copy the pen data into from the Material List. Click on Copy. Select the material you want to copy from in the From Material drop down box. Using the CTRL/Shift Key select from the pens to copy the pen numbers you want to copy and click on OK. If a data set for a destination exists it will be overwritten with this command.

Add / Update

Clicking on the add/Update button will replace the saved data with the data in the edit boxes.

Delete

To delete a pen, select the pen from the list in the top box and click on the Delete button.

OK

Saves changes and close pen setup window.

Com Port

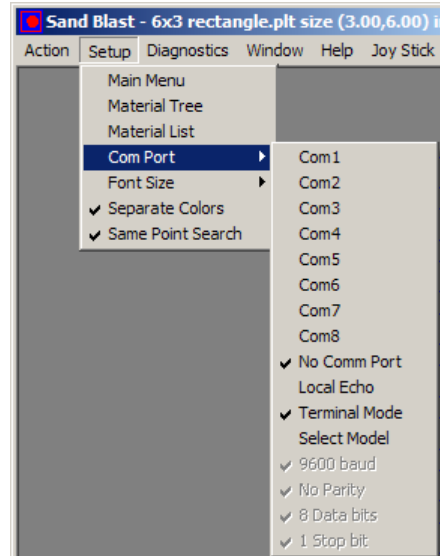
Com port is used to set the communications port to the Remote Panel that the QuickSand communications cable is connected to.

Local Echo

Local Echo allows program to echo characters typed into remote panel terminal screen.

Terminal

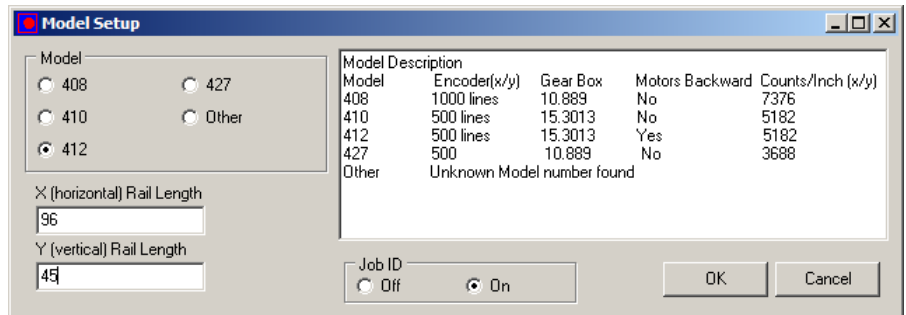
Turns on terminal emulation.



Select Model

Model

Model numbers depend on the motors and gear boxes you have installed in your QuickSand.



Model 408 was the first pilot run of machine manufactured. They had 1000 line encoders on the motors and 10.889 gear box. This motor had a long lead time and later machines are built with a more commonly available motor.

The model 410/412 are now being shipped. The only difference is the motor and encoder connections.

Since the model 408 motors sometimes have a long lead-time a model 427 was created for one customer. Both motors had to be replaced with the current motor.

X Rail Length

QuickSand machine come in different sizes. This parameter allows setting the size of the machine left to right. If a value < 24 is entered 24 is used. To set this parameter set this value to a very high number (e.g. 1000). Power off machine. Power on. Joystick to the end of the travel point. Open the main menu and read the x position. Use this x position as the x rail length.

Y Rail Length

QuickSand machine come in different sizes. This parameter allows setting the size of the machine top to bottom. If a value < 24 is entered 24 is used. To set this parameter set this value to a very high number (e.g. 1000). Power off machine. Power on. Joystick to the top of the travel point. Open the main menu and read the y position. Use this y position as the y rail length.

Job ID

Job ID on will ask for a job id for each image opened.

Font Size

Sets the font size for the Remote Panel Program.

Separate Colors

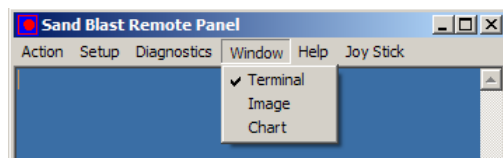
Allows turning off the default coloring of polygons for debugging of the polygon analyzer. Not used by customers.

Same Point Search

Allows turning off the almost same point search to close polygons that are not closed. Not normally used by customers.

Window

This menu allows selection between the three different communication windows to the QuickSand.



Terminal

The terminal window allows typing commands directly to the QuickSand and seeing the response. You can also monitor the communications between the QuickSand and the remote panel if you have enabled the debug log.

Image

This window is used to display a preview of the image that is currently opened.

Chart

This window is used to display debug information used by manufacturing. Not used by customers.

Help

About

Displays the version of the remote panel loaded on the computer.

Clear Log

Clears the terminal window.

Enable Debug Log

Turn on communication monitoring for the remote panel. Communications between the remote panel and the QuickSand are displayed in the terminal window.

Enable Character Log

Turn on detailed communication monitoring for the remote panel.

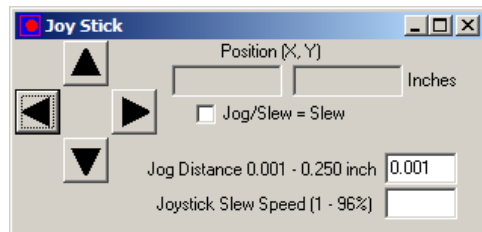
Polygon Fill Debug

Used by software engineer to debug program. Not used by customers.

Joy Stick

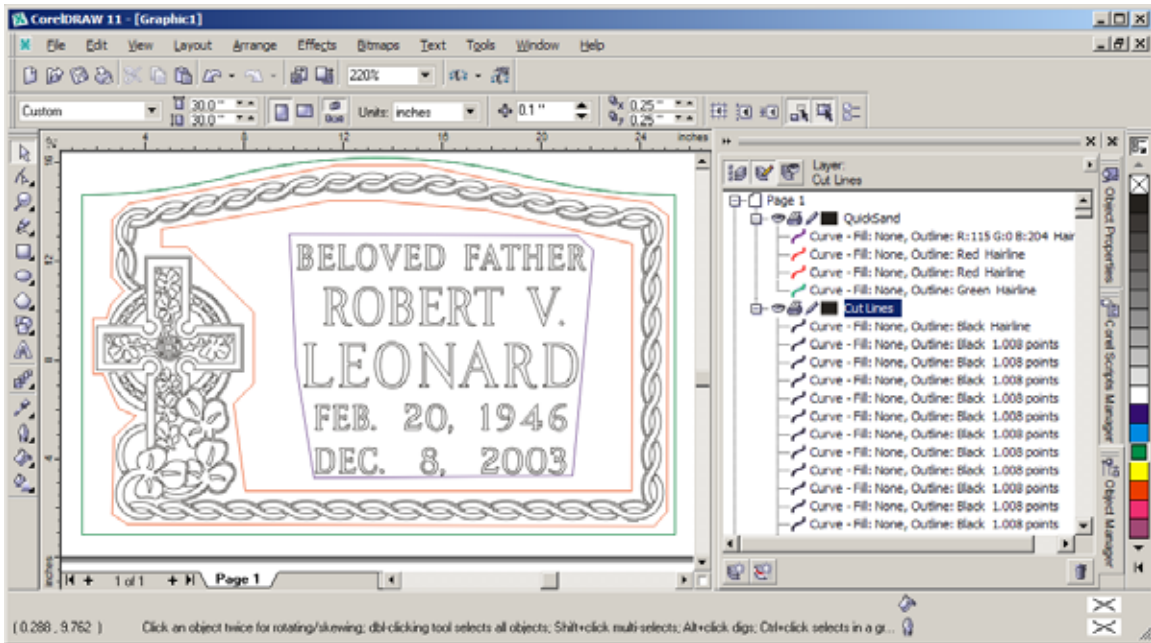
JOYSTICK The joystick is used for positioning the nozzle assembly.

The four **ARROW KEYS** are used to jog the arm or nozzle assembly. With the Jog/Slew box unchecked so that Jog/Slew = Slew, the joystick speed will be the speed set in the Joystick Speed Window. Left Click and hold the arrow button to move the nozzle. With the Jog/Slew box checked so that Jog/Slew = Jog, the arrow buttons will jog the nozzle that fixed distance each time the button is clicked.

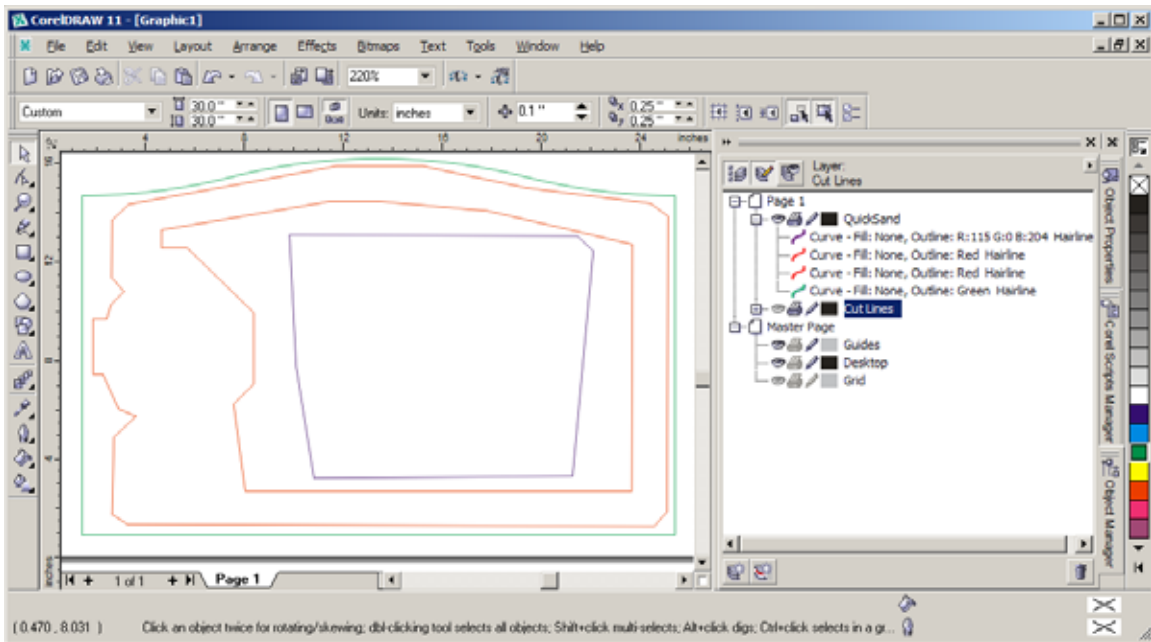


Job Preparation

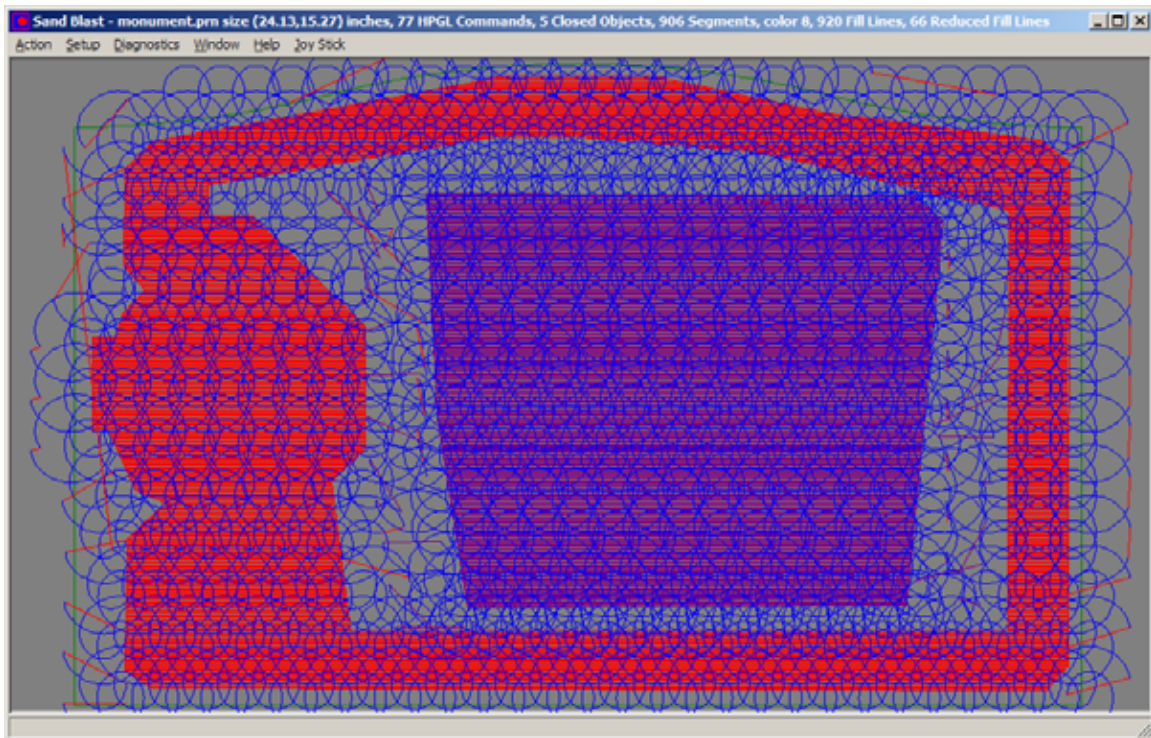
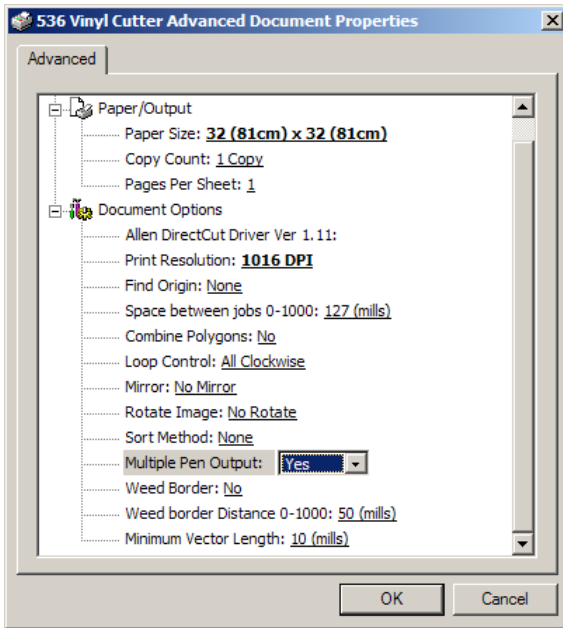
Using a cad system such as Corel Draw, Adobe Illustrator, Auto Cad, or Gerber Omega layout the monument. You will need to create two layers. One for the sand blast mask cut lines, which is cut on the 536-rubber cutter and one for the QuickSand areas. I have used CorelDraw for this example.



Note: there are two layers one containing the cut lines to be sent to the 536 rubber cutter, a second layer containing the blow areas. By making the Cut Line layer invisible I hide the rubber cutting areas. Then when I print using the DirectCut printer driver I only get the outline areas. If I wanted to cut the rubber stencil I would hide the QuickSand Layer and send the file to the Allen 536 rubber cutter. Here are the blow areas:



Using the pen table from Default Barre Gray displayed in section Material List / Pen Parameters, I used the red color to select pen 2 this gives me 3 passes over the design area. I used the violet color to select pen 8 to give me 6 passes over the letter area. The green outline pen 3 is the outline of the monument.

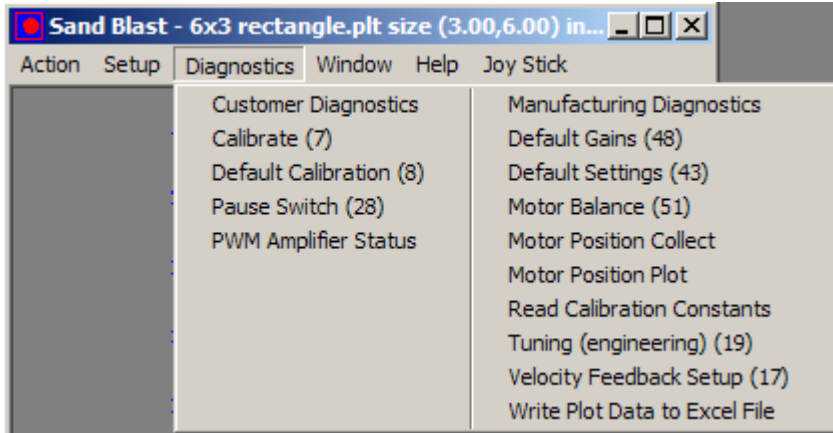


Diagnostics

The QuickSand firmware contains a set of resident diagnostics. When the QuickSand is powered up, it automatically performs a self-test program to check all operating parameters. If a malfunction is detected, the nozzle assembly will not initialize to the far end. If the remote panel is open and the com port is opened and reason for the failure will be output on the screen. Typing the letter E enter will also display the error message and start the ASCII remote panel

The fail-safe system is designed to detect failures in the operation of the electromechanical system in the QuickSand and to prevent such failures from causing other damage. The blaster

contains circuits that continuously monitor power supply voltages and the microprocessor system clock. The QuickSand will go to a hardware-reset condition if these voltages are not within normal limits. Over current conditions on X and Y-axis drive motors are also monitored. An over



current condition will cause a relay to open, cutting off power amplifiers from the drive motors. In addition, a number of internal sensors are continually checked. If any potentially damaging errors are detected, the system will cause the fail-safe circuits to open the relay and place the blaster in the error state. The error message will appear in the serial.log file in directory C:\Program Files\Allen Datagraph\Sand Remote Panel. They will also be displayed in the Setup -> Main Menu if the QuickSand is reset and the main menu is displayed.

Diagnostic Operation

The diagnostics in the QuickSand exist at several levels:

1. POWER-ON
2. CONTINUOUS HARDWARE AND SOFTWARE MONITORING
3. OFF-LINE

The **POWER-ON** diagnostics are performed at power-on or reset of the microprocessor and test the microprocessor, memory, servo analog and digital hardware, and some of the testable sensors.

After initialization, **CONTINUOUS HARDWARE AND SOFTWARE MONITORING** check the sensors and fail-safe monitors for machine malfunctions. If a malfunction is detected, an error message is output to the serial port, the protection relay is opened and the QuickSand ceases operation.

OFF-LINE testing is used for manufacturing and field service testing and for making certain adjustments to the QuickSand such as motor balance.

To Run Diagnostics if the QuickSand unit is stopped due to an error, Display the terminal window, clear the log file, and press E enter to display the error message and enter the ASCII front panel mode.

All diagnostics are run from the remote panel, most of which require the advance menu option on the other parameter page. To run the customer diagnostics from the remote panel program:

Open the remote panel

Click on the Diagnostics Menu

Customer Diagnostics

Calibrate 07

Normally the QuickSand does not need any calibration as none of the mechanical components have a tolerance. Use the default calibration to set the calibration constants. Calibration is used to set of the job so it matches a ruler.

Default Calibration 08

Sets the calibration constants back to the factory defaults for the model.

Pause Switch 28

Running this diagnostic will display 000 or 111 depending on the state of the pause switch.

PWM Amplifier Status

This displays the power amplifier status if the PWM power amplifier is installed.

Manufacturing Diagnostics

It is not recommended that the Manufacturing Diagnostics be run unless instructed by direct contact with Allen Datagraph Technical support. Damage to the system is possible.

Maintenance

Check belt tension monthly

There are 2 long x belts. These should be relatively tight. If the belt sags during the initialization it is too loose. Move the arm 2 feet from the end and pluck the belt. It should not flop around but not be so tight it makes a note.

There is 1 y belt that runs vertically through the arm. Move nozzle so there is a 2 foot section of the belt between the head and the pulley and pluck the belt. It should not flop around but not be so tight it makes a note.

Blow out electronic box monthly

The sand blast environment is very dusty. Once each month open the electronic box and using compressed air blow out any accumulated dust on the circuit boards and components. You can buy a aerosol can of compressed air from several internet sites.

Clean rails weekly

Once a week take a rag and wipe down the rails to remove accumulated dust and grit build up.

Check for looses screws monthly

Once a month check for screws that might have loosened up with machine operation. Check especially the screws on the coupling between the motor and the gearbox.

Trouble Shooting

Problem	Solutions
	<ul style="list-style-type: none">•

Error Codes

If the internal microprocessor detects an error condition, the letter E0 and a 2 digit code will be displayed on the control panel. Any key pressed after the error is displayed will place the machine in the diagnostic mode, indicated by a flashing "D" on the control panel. Recommended diagnostic procedures (D##) are listed in the error description.

- NONE One or more of the 7 LEDs on motherboard are off - check PCBs loose in socket, fuses in power entry module blown, 115/230 VAC switch in wrong position, front panel PCB disconnected, loose cable from power supply to motherboard PCB, Missing ± 5 volts, ± 15 volts, ± 32 volts, micro PCB dead.
- bad calibration constants. Must run diagnostic D008, then calibrate QuickSand.
- collision sensor tripped
- escape command parameter out of limits
- eeprom initialized to default settings
- escape command not implemented
- EPO latch failure check seating of servo and CPU Board
- EPO latch or EPO reset failure check seating of servo and CPU Board
- excessive position error x axis or excessive position error y axis. This can be caused by speed or acceleration too high, obstruction in way of machine, bad calibration constants, power surge, servo motor / encoder failure, servo PCB failure, power amplifier pcb failure, relay on motherboard.
- buffer overflow
- hpgl compatible command parser error
- initial move positioning error; carriage didn't move
- invalid character in escape command
- joystick disabled
- motor over-current, DAC or analog failed check seating of servo and CPU Board
- motor over-current - power amp failed check seating of servo and CPU Board
- pause switch on
- Relay opened. No reason given
- rs232 device overrun (broken cable, wrong handshake, broken serial hardware in computer/QuickSand)
- rs232 framing error QuickSand communications default for serial port is 9600,n,8,1. Data received from serial port does not appear with these parameters
- rs232 parity error
- servo interface bus error
- servo motor over current Normally caused by motor jam. Check servo pot adjustment.
- servo motor over-current sensor failure check seating of servo and CPU Board
- servo motor over current sensor failure
- servo timeout Cutter software error or servo PCB failure - D10. Check earth ground. Prevent electrostatic discharge.
- timeout latch failure check seating of servo and CPU Board
- too many parameters in escape command
- unexpected arithmetic fault

- unexpected constraint fault
- unexpected nmi interrupt
- unexpected machine fault
- unexpected operation fault
- unexpected parallel interrupt
- unexpected protection fault
- unexpected real arithmetic fault
- unexpected reserved fault
- unexpected servo interrupt
- unexpected trace fault
- unexpected type fault
- unexpected interrupt
- waiting for first vector to complete
- x axis encoder detector failed
- X-axis encoder failed check seating of servo and CPU Board
- X-axis position counter failed check seating of servo and CPU Board
- X-axis encoder detector failed check seating of servo and CPU Board
- Y-axis encoder failed check seating of servo and CPU Board
- Y-axis position counter failed check seating of servo and CPU Board
- Y-axis encoder detector failed check seating of servo and CPU Board