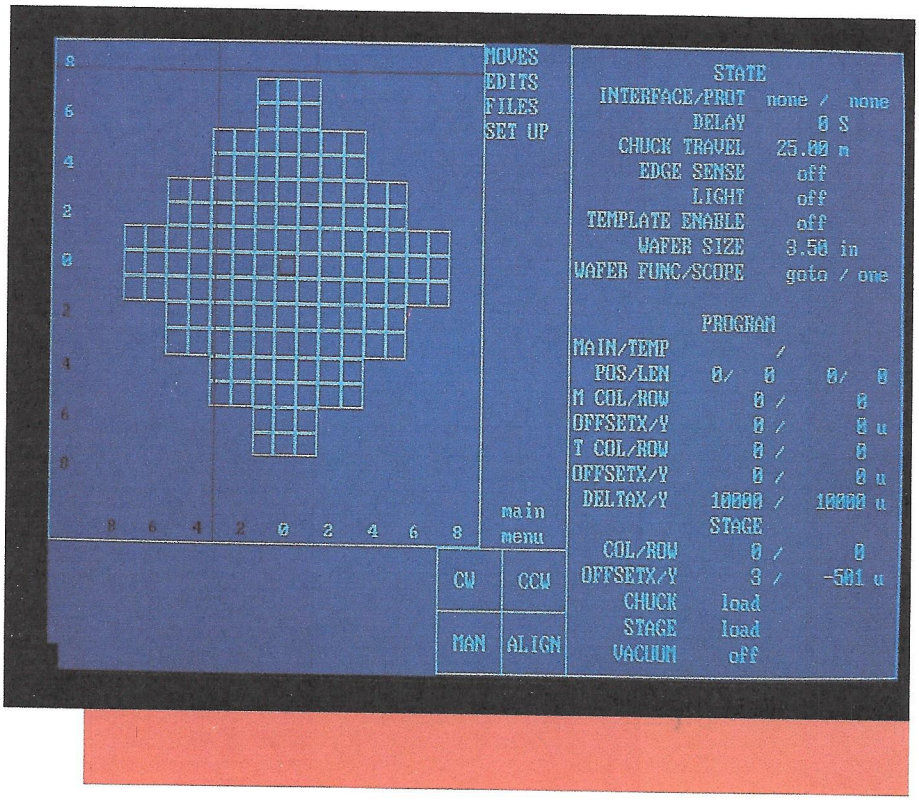
Never has so much power and versatil incorporated into one probe station. W failure analysis, parametric testing or production probing, the S-460 series i

With over twenty years of experience in the analytical probing business, SIGNATONE developed the S-460 series to be a powerful tool for solving probing problems. The system is extremely versatile and reliable. The system includes the probe station itself with a solid aluminum cast base weighing in at close to 300 pounds; a controller built around a 386-AT BUS system with a hard disk, and power supplies; and a console featuring a VGA monitor, keyboard and mouse.

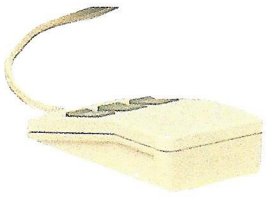


The Power is in the Software

The graphics interface allows mouse control of most functions without entering anything through the keyboard. Over 120 commands provide a variety of moves, programming, set-ups and utilities.

MOVES

To move from one circuit to another, just line the cross hair on the wafer graph and zap, you're there. Also, the S-460 series is the first to offer cruise control movement. That's right, just move the mouse and the chuck follows; pick up the mouse while still moving and the chuck will continue at the same speed until stopped by tapping on the button. Not only does this movement have micron resolution but your hands are kept away from the probing environment reducing the induction of vibration or contamination.



Of course you can enter X-Y coordinates through the keyboard or interface and move as well. The coordinates may be either Row/Col or X/Y distances in microns or inches. Or, you can step through a pre-recorded program automatically or one step at a time. Wherever you need to move to, there is a variety of ways to get there.

PROGRAMMING

This is the area where the smarts really count. Five methods of recording test sites are available. First, step and repeat where every die is a test site. Simply select the 'Enterall' command and presto, all die steps are recorded. Second, selective step where only some of the die need to be probed. Simply select the 'Enter' mode and move the cross hair around on the wafer graph to record the desired sites. Third, point specific or learn where the chuck is driven around to any point on the wafer and recorded. The probe station will return to these points with +1 micron accuracy. Fourth, nested points where points can be nested in a subroutine. A few specific points are recorded within one die or circuit. When the system runs, it moves a

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step then to the sub-routine points. Fifth, down loading through the interface through a custom interpreter if needed. The system receives the X-Y coordinates of all the test sites and records them.

The number of test sites that can be recorded is RAM dependent and may be expanded. A standard system will record approximately 10,000 points.

PROGRAMMABLE "Z"

A 6 micron resolution stepper motor drives the chuck up and down. The Z motion is set in one of two modes, preset distance or 'soft z'. The preset distance can be set anywhere between .00025 inches to .025 inches in .00025 inch increments. Whenever the chuck is raised it moves the designated distance.

The 'Soft Z' mode requires a signal from an edge sense circuit built into the probe card. Special features like programmable over drive, maximum Z and some others help to set up the 'soft Z' function best for the sample under test. In this mode the chuck raises until the 'open' signal is received from the probe card. It then continues raising to the preset 'over travel' distance.

The speed of the Z motion is also programmable. For very soft landings, the chuck Z speed could be set for 1 second to travel the preset distance. The speed is adjustable between .050 seconds and 1.25 seconds.

SET-UPS

The number of different set-up possibilities is infinite thus creating the versatility needed for your complex probing requirements. The first time you run a particular wafer, it may take a while to set everything just as you like it. You enter the step size, draw the wafer graph, set the programmable Z controls, configure the interface and about 10 other set-up features. But, once you've made the set-up, it can be stored on the hard disk or a floppy disk. Next time you run that wafer, just load the file and you're all set in about 30 seconds. The hard disk is organized such that 12 different users can keep their files separate from yours.

WAFER MAPPING

The S-460 series also features wafer mapping and inking capability. Up to 4 inkers may be connected at one time. The interface command '!20 #' specifies to fire inker 1–4.

Color mapping is also available with up to 16 different color combinations. The colors are displayed on the VGA wafer graph. The map can be stored for future recall or printed out in color or black and white. Black and white printout designates a bin number rather than color.

The Controller Takes Charge

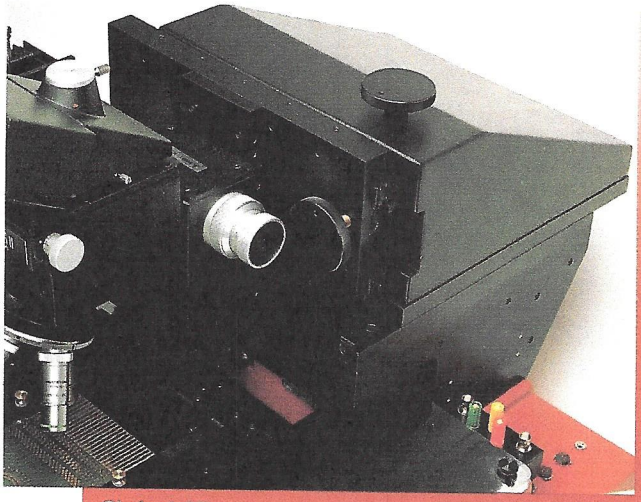
The system is developed around an AT-386 microprocessor and includes at least 1 Megabyte of RAM and a 40 Megabyte hard disk. Communicating with test instruments can be accomplished through an RS-232 or GP-IB interface. You can set the system into a slave mode where the probe station watches for commands through the interface, executes the command and returns a 'complete' signal after the execution. Most all of the commands are executable through the interface.

The other option puts the controller in charge of managing the test instrument and data. First you develop an executable file custom to the required test instrument and desired method of data collection. Then the prober is placed in the auto execute mode. The prober steps to the first test site, runs the executable program then automatically continues to the next test site, etc., until all sites have been tested.

The controller includes a few empty slots for expansion as well. Driver boards for Signatone's Computer Aided Probes or other test instruments plug right into the standard AT-BUSS. Not only is the system extremely versatile now, but as technology changes the system can grow and improve right along with it making the S-460 series the choice for today and throughout the 1990s.

Rock Solid Base Station

The solid aluminum frame provides a stable environment for high powered optics with magnifications up to 3000×. The frame also holds the proprietary linear motor thus allowing 1 micron resolution and repeatability. The linear motor is actually built into the stage itself thus eliminating lead screws and linkage backlash. A glass scale feedback system provides the position information to the controller. The base includes all of the mechanical features you would expect to find on a top of the line analytical probe station as well.



Six inch Microscope stage

MECHANICAL FEATURES

The S-460 is loaded with numerous features for easy set-up and various applications which would be expected from a good analytical probe station.

Six inch X-Y Microscope Stage The coarse and fine microscope stage supports Microzoom and Mitutoyo Finescope high powered optics. The microscope may be positioned anywhere within a six inch square area centered over the vacuum chuck stage. The coarse motion is a simple push-to-position movement. The large knurled knobs permit sub-micron resolution fine motion. The large microscope translation permits wafers scale probing, and quick push away for setting up tight test fixtures.

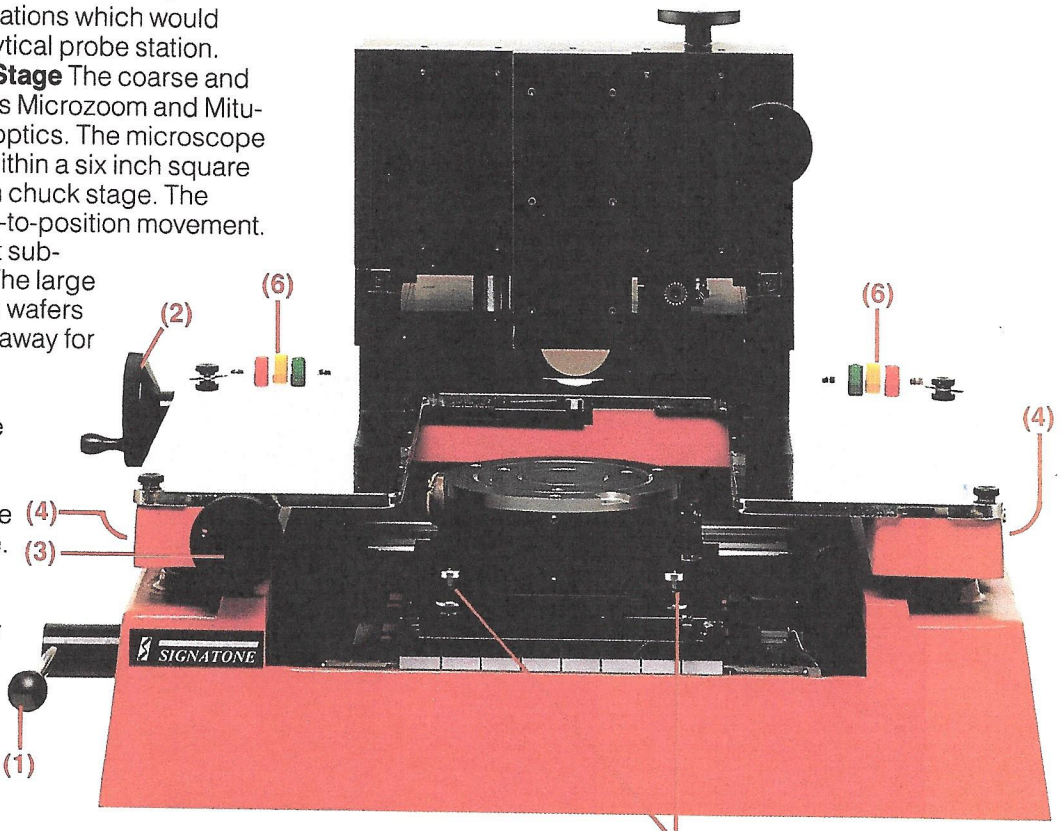
Roll-Out Stage A quick release roll-out stage allows the vacuum chuck to slide forward for easy loading and unloading of test devices even when probe cards or test heads are in place. The chuck pulls forward 5 inches in front of the casting.

Linear platen lift (1) A lever action platen lift is also provided for coarse movement of the platen. The lever features a continuous stop which permits raising the platen to any point within the .25 inch range.

Platen set-up (2) A crank style knob located to the left of the platen allows the user to raise and lower the platen for a variety of applications. The 1.2 inch motion is sufficient for set-up with hot chucks, probe cards, socket cards or a variety of other applications including SIGNATONE's hot chuck systems.

Platen Rotation (3) Because some probe cards are not built square to the X-Y stage motion, SIGNATONE has included a platen rotation mechanism whereby probe cards can be aligned correctly.

Vacuum plumbed for micropositioners (4) Individual vacuum control damper knobs permit the user to set the feel of the vacuum hold down on each of the micropositioners.

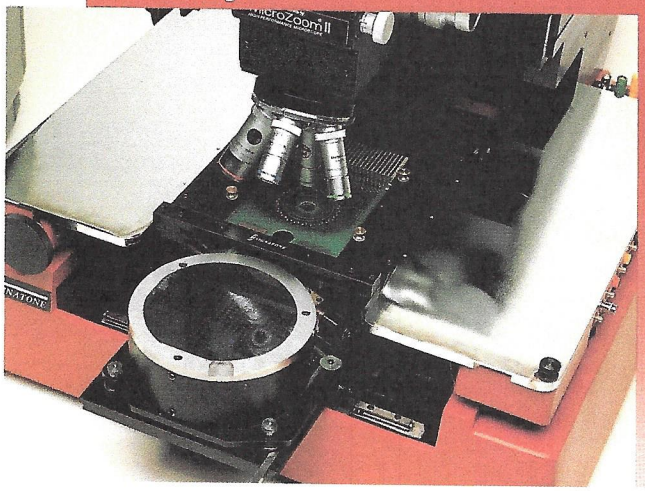


Hand Planarization (5) One of the most common maintenance problems of all probe stations is keeping the vacuum chuck planar to the probes. Signatone has included 2 thumb screw adjustments for quick planarization of the chuck.

Color coded signal connections (6) Up to 10 probes may be connected to the system. Test lead wires plug directly into color coded phone jacks or BNC connectors. The system includes 2 BNC connectors and 3 phone tip jacks on each side of the platen.

Other connectors As many as 4 inkers may be connected to the system. Also, a connector is provided for the edge sense circuit and back side ground or chuck signal.

Roll-Out Stage



Specifications

Power Supply/Controller Cabinet
Dimensions:
Height 24.25 inches
Width 19 inches
Depth 24 inches
Weight 85 pounds

Operating System:
AT-386 Bus 20 MHz, 1 Megabyte RAM, 40 Megabyte hard disk, DOS 3.3

Interface Ports:
Standard: Serial RS-232, Parallel Printer
Optional: GP-IB (IEEE-488), CAP-940 Computer Aided Probing System

	S-463	S-468
X-Y STAGE MOVEMENT		
X-Y Travel	6.1 inches/152mm	8.0 inches/200mm
Resolution	1 micron	1 micron
Repeatability	±1 micron	±1 micron
Accuracy	±3 microns	±5 microns
Drive System	Proprietary linear motor and feed back system.	
CHUCK MOVEMENT		
Programmable Z range	637 microns	637 microns
Resolution	6 microns	6 microns
Speed	Programmable	Programmable
Maximum	500 microns .050 seconds	500 microns .060 seconds
PLATEN		
Coarse motion	Linear 4.75mm	not available
Fine motion	Linear 30.5mm	Linear 30.5mm
Pivot Rotation	17 degrees	17 degrees
Dimensions		
Width	21 inches	23 inches
Depth	17.25 inches	19.75 inches
Center cut-out	8W x 15D inches	8W x 17D inches
Capacity	10 Signatone S-926 micropositioners	
CASTING DIMENSIONS		
Height	17.5 inches	18 inches
Width	23 inches	27.5 inches
Depth	25 inches	27 inches
Required Working Area		
Height	24 inches	24.5 inches
Width	26 inches	30.5 inches
Depth	31 inches	33 inches

Console Dimensions
The console includes a keyboard, mouse with mouse pad, and a VGA monitor. The console requires a foot print of 18 inches wide by 30 inches deep.

Recommended Options

To complete the system requires the following accessories:

- Choice of Cambridge Microzoom or Mitutoyo Finescope microscope.
- Probe card adapter
- Micropositioners
- Probe Tips and Holders

Popular Options include:

- Color Monitor System
- Computer Aided Probes
- Digital DC hot chuck
- Light tight enclosure