

How Soft Tooling Cuts Development Time and Costs

The cost-effective soft tooling concept TAM pioneered with its programmable punch is now extended to include the multiple-pin head versatility of the Model 359. With this approach, you can selectively replace any one punch, quickly and easily. This is a significant improvement over dedicated hard tooling, where a single change obsoletes the entire punch and die.

Abandoning the hard tooling trial-and-error method in favor of the soft tooling system saves thousands in scrap costs during package development and custom-package production at any volume. Equally important, when you scrap the punch-and-try hard tooling approach in favor of the soft tooling concept TAM's Model 359 punch uses, you cut development time by 8 to 16 weeks.

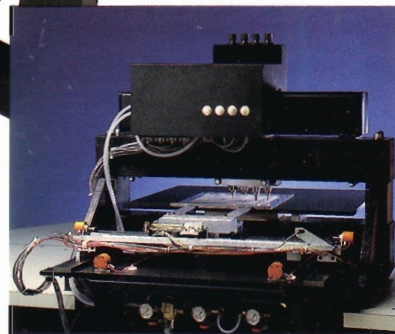
With the TAM soft tooling approach, you can keep prototype development in software. Now a change in hole location or ceramic material won't set your entire development program back six weeks or longer.

If a hole location changes, just revise the program and you're back on track immediately for thousands of dollars less than hard tooling changes would cost.

A change in material won't make any difference. You can use the same punch and die sets with the same program (hole locations); simply adjust the shrinkage factor as required by the new material.

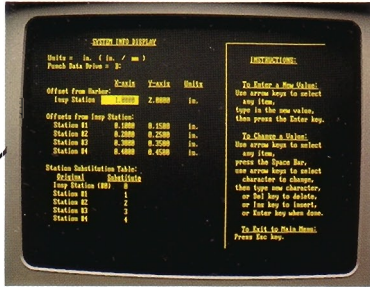
TAM's Powerful New Multi-Pin Punch Offers More . . .

Speed The Model 359 productivity-plus punch delivers up to 3 holes per second with greater than 1/2g acceleration and 20 inches per second transport speed. The tooling platform's unique plotter-type positioning system uses linear stepper motors to quickly and accurately locate the substrate. Double-action toggle mechanisms cycle the punches faster and with higher force than conventional methods.



Linear stepper motors use precision technology originally developed for plotters to locate hole positions on substrates up to 100 in. sq.

Quality Precise, single-pass mechanical punching provides clean holes with well-defined edges. Vias and cavities yield predicted electrical characteristics because defects such as edge buildup, drill rifling or laser burn and blowout aren't there to degrade performance.



IBM PC-compatible computer features 20-megabyte hard disk, 360-kilobyte floppy, RS-232 communications port, a parallel printer port, and 640 kilobytes of RAM

Accuracy Software accepts data to the nearest 0.0001 inch. System resolution is ± 0.0001 in. Precision linear stepper motors position hole locations within ± 0.0003 for any one punch, with a repeatability of ± 0.0003 in. and an accuracy of ± 0.0006 in. from punch to punch. There is no cumulative error.

Flexibility The Model 359 combines simple hardware setup with easy software programming. One machine accommodates as many as four punches in any mix of shapes, sizes and configurations. Use multi-pin punches up to 1.15 inches (29 mm) cross-section, or single punches from 0.006 inches (0.15 mm) round up to 0.625 inches (15.9 mm) cross-section. You can punch ware up to 0.100 inches (2.5 mm) thick and 10 inches (25 mm) square.

Ease of use An optical inspection system makes it easy for the operator to check setup, verify hole location and quality, and measure distances between holes.

IBM-PC[®] compatible menu-driven software permits hole location entry in English or Metric units, automatically compensates for shrinkage and provides convenient pattern editing utilities. The operator simply enters shrinkage factors for the tape used, pattern positioning information, and punch coordinates based on fired tape dimensions.

Up to 10,000 hole locations can be included in each punch pattern program. Patterns can be stored on the 360-kilobyte floppy disk or the 20-megabyte hard disk, which will hold up to 400 patterns of 1000 holes each. An RS-232 port permits downloading of punch data files from a host computer. There's also a Centronics-compatible port that permits printing punch data on a parallel printer.

Maintainability Comprehensive self-test and diagnostic routines for each machine operation verify correct performance and simplify maintenance. A special maintenance mode menu prompts the technician and provides concise status information.



Pull-out drawer provides ready access to sophisticated electronics that drive precision transport

The TAM Model 359 Hi-Speed Multi-Pin Punch, practically a custom package plant in itself, occupies about 14 square feet of floor space

