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## Camera improvements boost flying prober inspection quality

By Ann R. Thryft, Contributing Technical Editor -- *Test & Measurement World*, 8/1/2008

The ability to perform optical inspection is a fairly recent addition to the feature set of flying probers, and newer camera technology is helping to boost that ability even further. Seica's GM David Sigillo commented on how the use of cameras in flying prober test has changed over the last three years and what those changes have meant for electrical in-circuit test.



**DAVID SIGILLO**  
General Manager, Seica

### Q: Why are cameras being integrated into flying probers?

**A:** Most basic flying probers now have one camera, integrated into the prober's test-head area and mounted on a mobile probe that flies over the circuit board to be tested. Since operators manually install the board inside the prober, the board's placement can vary slightly. The operator correlates the board's location inside the prober to the probe-head assemblies of the tester by moving the camera over the board's fiducial markers, of which a minimum of two are needed. The system does this correlation automatically, based on previously programmed fiducial marker locations.

For example, if an installed board is not parallel to the rails in the tester, a slight angle offset occurs. Once the camera locates the markers, however, the prober computes the offset and feeds it back into the tester software that recalculates all the test-point locations or probing locations that the tester will target.

### Q: Why do some probers have more than one camera?

**A:** Some prober models include numerous cameras, depending on whether they are single-sided or dual-sided probers. Cameras can be mounted so that they have access to one or both sides of the board. For example, Seica's new double-sided Pilot V8 flying prober has two CCD cameras, one on each side. The main need for the second camera is to visually inspect the board's components on the side opposite to the side being tested.

In electrical inspection, you may not have access to the board's signal net or can't perform an electrical test on a single component. If there's a known-good board from the customer, you can take a digital image of the component and its location and compare it to the image stored in memory for those components to which you have no electrical test access.

### Q: What are some capabilities of newer cameras that are being integrated into flying probers?

**A:** In addition to detecting component presence, placement, skew, and orientation, newer cameras can also perform optical character recognition on characters etched on the board or components, such as part numbers or serial numbers. These same cameras can also digitize an image of the board, which allows operators to recall that image on an offline PC for off-tester engineering activity.

An additional improvement in flying prober cameras and image-acquisition software is the ability to capture multiple images of the board and its components. For example, components with the same electrical value from more than one vendor may look different, and the customer may want to use either one in production. Images captured by the cameras can be compared to a variety of images stored in the prober database, providing more flexibility in visual inspection acceptance criteria.

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