Advances in Probe Technology:
Best Sessions of the ‘97 Southwest Test Workshop

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The Southwest Test Workshop is the only IEEE sponsored event with a primary focus on testing microelectronic devices at the wafer level. The 1997 workshop was held in San Diego, California from Sunday, June 1 to Wednesday, June 4. Over four hundred test professionals listened to 7 technical sessions with 3 to 4 presentations per session, and they participated in four panel or open discussions. The highlights of three of these sessions will be presented by members of the SWTW Program Committee at the 1997 International Test Conference. After each presentation, other panel members and the audience will be encouraged to share their views and experience.

The first session to be summarized reviews the issues of physically connecting, or docking, a many hundred pound test head to an even heavier automatic wafer prober. This interface must be established and maintained while requiring a fraction-of-a-mil and gram force accuracy. The presentation will describe the size and weight of the new generation test heads, present docking approaches, and a few new methods being introduced. The probe tip to pad positioning process will be discussed in terms of alignment, planarity and scrub profile accuracies. Finally, from a probe card vendors perspective, the design and project management concepts for an integrated solution will be reviewed.

Temperature probing was another excellent session at ‘97 SWTW. The majority of device manufacturers are probing at elevated temperatures, but previous workshop discussions revealed that almost no one was completely satisfied with their process. The general issues and some experimental plans will be given in a Sematech overview. A finite element analysis will show some of the thermal deformation and stress in various components of the probe card assembly. A new probe card technology will be shown that addresses some of these issues, and some outstanding work on wafer temperature control by newly developed probe chucks will be described.

The final subject to be summarized is new probe technologies. While membrane probe cards seem to be losing ground for high pin count digital devices, at least one company has been successful in supplying low pin count membrane cards for microwave frequency probing. There have been significant advances in conventional epoxy ring needle cards that will be reviewed, and very rapid growth in vertical probe cards. These existing technologies will be discussed as well as some exciting new technologies publicly presented for the first time at the Southwest Test Workshop.