



# **FTR** THE FINAL TEST REPORT

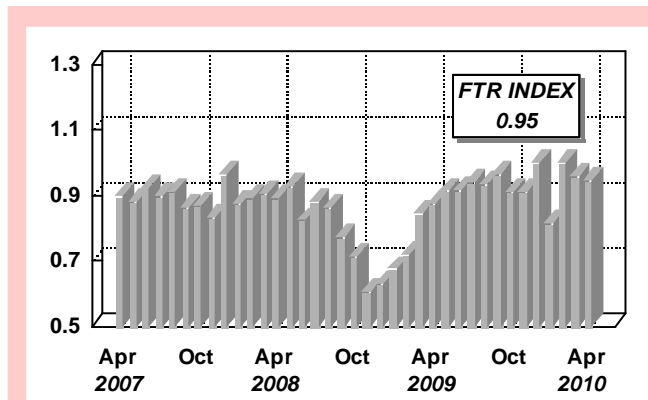
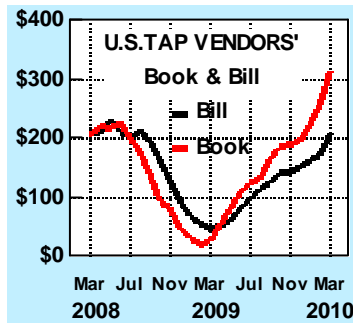


Vol. 21 No. 05

May 2010

## TAP is Back – Most Major Vendors Post Profits for Q1'10

**D**emand for back-end equipment had begun to rise gradually during the final two quarters of 2009, but accelerated in the first quarter of this year. As a result, the major vendors, that reported their CYQ1 results reported GAAP profits for the quarter - with the notable exception of FormFactor. The recovery was documented by SEMI's report that its preliminary TAP equipment book-to-bill ratio for March hit an all-time record of 1.51. (Its previous high TAP book-to-bill was 1.50 in March 2000). The SEAJ reported that its three-month TAP equipment book-to-bill ratio for March was 1.20 - down from 1.38 in February. However that drop was not unexpected as March was the final month of Japan's business year.



FTR's index of ATE, chipmakers, and PC makers vs. the Dow-30, slipped in late April as some analysts began to worry about inventory issues.

In fact, in March the 'actual' - not 3-month average - ATE portion of its TAP equipment B/B was just 0.77, due to the fact that its bookings for the month were up just 0.5 percent sequentially, as billings rose a very impressive 49 percent sequentially, the SEAJ reported.

### Teradyne

Teradyne led off the "good news reports" on April 22, when it reported a GAAP profit for its first quarter of 2010, ended April 4, of \$50.1 million, or \$0.24/share on revenue of \$330 million. It was its second consecutive quarter of GAAP profitably. It said that its semiconductor test equipment sales for the first quarter were \$290 million and bookings for that sector of its business were \$460 million. Teradyne said that was its best quarterly bookings for its Semi Test unit in ten years.

Continued on page 2

### INSIDE INFO

	Page
<a href="#">Celebrating the TAP Rebound</a>	3
<a href="#">Global Billings Report</a>	4
<a href="#">Chip Equipment B/B</a>	4
<a href="#">Top 10 Chip Eqpt. Vendors</a>	5
<a href="#">TAP Co. Q1'10 Financials</a>	6
<a href="#">Company Focus - Teradyne</a>	7
<a href="#">More TAP Consolidation</a>	8
<a href="#">Adaptive Test Solutions</a>	9
<a href="#">Advantest Profitable Again</a>	10
<a href="#">SIA's Move to Washington, DC</a>	11
<a href="#">Freddy's Test Report</a>	12

**Continued from page 1**

It also noted that OSATs accounted for 36 percent of its Semi Test bookings, up from 32 percent in the previous quarter. IDMs accounted for the balance of its Semi Test bookings – 64 percent and 68 percent respectively. As a result it guided to total second quarter revenues of \$390 - \$420 million and EPS \$0.45 to \$0.52. As a result Mike Bradley, it president/CEO, said “the present (June) quarter is poised to deliver our highest profit rate in nearly ten years.”

Bradley also noted that, “a number of things contributing to our strong showing; first of all the utilization remains very high in our leading edge products. Device unit volumes are increasing and the appetite for testers that provide high performance and high productivity is on the rise.” He added that “During the downturn, many older generation testers were permanently decommissioned, and as the market has recovered customers are buying new capability for the future rather than bringing old testers back in production. We’ve seen evidence of this in our higher end in our *UltraFLEX* system sales where more than half of the testers ordered in the first quarter included new options were introduced since mid-2008.”

“With regard to the sustainability of the demand curve, Bradley said, “clearly, this past quarter has been exceptional, for the breadth of the demand. Part of the demand comes from the return of capital for the test sector after two years of very low buy rates, and part comes from next generation performance buying. But, even with the strong momentum across the market, the two and three-year buy rates remain historically low. However, the memory test market is not on the same recovery trajectory as SoC. That market is only now slowly starting to increase CapEx outlays, continues to lag the SoC tester market.” (Its memory test sales actually fell sequentially, from \$18 million in the fourth quarter of 2009 to \$16 million in the first quarter of 2010.

**Advantest**

Teradyne’s strong report was followed by Advantest’s announcement on April 28 that it had also returned to profitability in its final quarter of its business year, ended March 31, 2010. It was the company’s first profitable quarter since its FQ3, ended December 30, 2007. Its financial report provided very little information for the quarter as it focused on its full year results (see p.10). It did report that its total sales for the quarter were US\$236.9 million, up 67 percent sequentially (in yen). Clearly its sales for the quarter represented a strong effort so ship everything it could at the end of its business year. It also was consistent with its historical record of accounting for roughly 40 percent of all Japan based TAP equipment sales of about \$600 million in quarter as reported by the SEAJ. Its net profit for the quarter was US\$14.3 million, compared to losses in both the previous quarter and the year previous quarter. Its orders for the quarter were US\$253.4 million, up 24 percent sequentially. Its total tester sales were \$168.6 million in the quarter, but it did not provide any breakdown by tester type for the quarter, except to say that memory tester sales accounted for a larger portion of its product mix than they had for many quarters. Its sales of handlers and interfaces for the quarter were \$46.3 million. Its backlog at the end of the quarter was \$233.7 million, up just 8 percent sequentially, but up 250 percent YoY.

Advantest did not give any forward guidance, citing “a continuing lack of market visibility. However, it said it believes “the tester market will continue to display a recovery pattern.”

**COHU**

COHU the global leader in test handler sales reported that its sale of those products – from Delta and Rasco – were \$54.7 million in the first quarter of 2010 – or about 86 percent of its total sales. Semiconductor equipment related revenues for Q1 were approximately 88 percent international and 12 percent domestic.

Orders for handlers were \$81.8 million for the quarter, up from \$68.8 million for the fourth quarter of 2009, at their highest levels since the first quarter of 2000. Semiconductor equipment orders increased 25 percent sequentially to \$74.7 million. The unit order distribution was thermal handlers 23 percent and high speed handlers 77 percent. Q1 unit orders for handlers increased 42 percent sequentially and a remarkable 650 percent from the first quarter of 2009. Although it did not break-out the profitability of its handler business, it reported GAAP profit of \$0.9 million for the quarter, its third consecutive profitable quarter on a non-GAAP basis. James Donahue, its chairman/CEO/president, said, “Semiconductor equipment orders were at the highest level since the first quarter of 2000. Unit orders for test handlers in Q1 increased 42 percent sequentially and a remarkable 650 percent YoY. Demand was strong for all major handler products. Rasco had another excellent quarter, including record quarterly orders, supporting our view that Rasco is gaining market share in the gravity and test-in-strip handler markets.”

Donahue concluded, “Semiconductor sales are improving and customer forecasts for our equipment continue to strengthen, typically with requirements for fast delivery. We expect volatility in near-term capacity requirements, but customer sentiment remains positive.”

**FormFactor**

FormFactor was the clear exception to the positive results reported by the other major TAP equipment suppliers in the quarter. It reported a net loss of \$38.2 million or \$0.77/share on revenues of \$39.7 million, up 20.2 percent from \$33.0 million in the fourth quarter of fiscal 2009, and up 44.9 percent from \$27.4 million in the first quarter of fiscal 2009. Its loss for the quarter was worse than its loss for the fourth quarter of fiscal 2009 of \$28.0 million or \$0.56/share and a loss for the first quarter of fiscal 2009 of \$37.9 million or \$0.77/share.

## IN FTR'S OPINION

### ***In Celebration of the TAP Eqpt. Rebound***

As I wrapped-up this issue of *FTR*, I realized that it is devoted in great part to the remarkable rebound of the major remaining ATE vendors during the first quarter of 2010. However, I believe that it deserves the attention it got this month. It has been a rough couple of years for this industry.



As the graph on the cover of this issue shows, beginning in April 2008 and continuing through March 2009 bookings, and consequently sales, of back-end equipment fell steadily and at a rapid rate. In fact, for all of 2009 SEMI estimates that test equipment sales dropped 55 percent and the assembly and packaging segment fell 31 percent, according to SEMI. However, as that graph also shows, the rebound for booking has been even more rapid than the fall - with last month's book-to-bill for U.S.-based TAP vendors hitting an all time high.

The other reason this issue is so focused on a relatively few ATE companies is that there are now so few of them.

The table below - based on a report from Gartner - shows just how concentrated the ATE equipment business has become. The top two companies accounted for almost 60 percent of all ATE sales in 2009. The second two - Verigy and LTX-Credence - have yet to report their latest 2010 quarterly results.

<b>ATE Market Shares</b>		
	<b>2009</b>	<b>2008</b>
<b>Teradyne</b>	34%	34%
<b>Advantest</b>	24%	26%
<b>Verigy</b>	20%	19%
<b>LTX-C</b>	8%	11%
<b>Others</b>	15%	10%

Source: Gartner, April 2010.

However, the latest analyst consensus is that Verigy will see its revenues increase by 65 percent YoY, to \$115 million this quarter. LTX-Credence is expected to more than double its revenues YoY, to \$54 million. As a result, it's likely that these four companies could account for as much as 95 percent of all ATE revenues for 2010.

One very major reason for the strong rebound in demand for back-end test equipment can be found in *IC Insights' 2010 McClean Report* which was released at the end of last month. It reports the first quarter of this year registered the highest level of IC shipments on record at 44.5 billion units (surpassing the previous high of 44.1 billion units in 3Q08), and 59 percent higher than the 28.0 billion units shipped in the same quarter last year.

IC Insights added, "As a result of the slowdown in unit growth last year ATE, as a percentage of all equipment, declined from 7.9 percent in 2008 to 6.9 percent in 2009, even as overall chip equipment declined.

This trend was most pronounced in the memory segment, as memory test as a percentage of overall test dropped another 11 percent, 'This drove another down-tick in Advantest's market share. However, with semiconductor revenues/units trending solidly up YTD, we look for underlying test capital intensity to recover, and for memory test spending to begin to emerge in 2H10."

As a result we look for underlying test capital expenditure intensity to recover and expect that even memory test spending, to begin rise in 2H10." It added, "seasonal strength is forecast to help the IC industry to continue to set new quarterly unit records.

Strong support for that thesis can be found in the most recent reports from the two major wire bonder vendors - K&S and ASM - often cited as leading indicators of the overall TAP outlook.

K&S has provided only preliminary results for its quarter ended April 3. But it said it expects revenues of \$153 million and that to increase to approximately \$205 million in the present quarter. It said "We are able to give revenue guidance for the June quarter \$205 million a few weeks earlier than normal because of unprecedented demand for both ball bonders and wedge bonders."

It added, "This same strength in demand gives us visibility into the beginning of the September quarter and while it is too early to give guidance for that quarter, so far we are seeing a continuation of current customer demand patterns."

K&S' main competitor, ASM Pacific Technology, reported that its wire bonder bookings in the quarter rose 35 percent sequentially and resulted in a 1.67 book-to-bill ratio. Its backlog increased 73 percent sequentially, providing revenue visibility into at least the third quarter of this year.

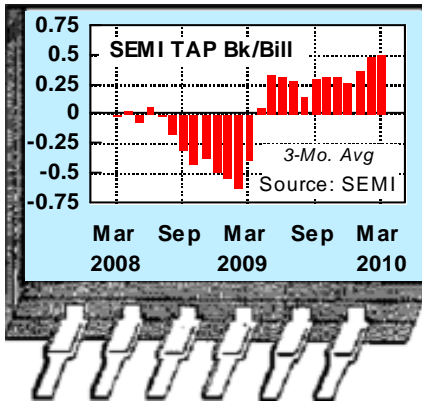
Another indicator that the rebound in TAP equipment sales will continue, at least through 2010 and into 2011, is the boom that the OSATs are reporting. For example:

- ASE, the largest test and assembly firm said its first-quarter revenue was up 180 percent YoY and up 43 percent sequentially.
- Amkor Technology saw first-quarter revenue increase by 66 percent YoY.
- STATS ChipPAC said its revenues for the first quarter 2010, were up by 79.5 percent YoY.

It's generally reported that they are running at >90 percent utilization rates and going to need more equipment to maintain these growth rates.

As a result, this writer remains optimistic about continuing demand for all TAP equipment - at minimum through the first half of 2011.

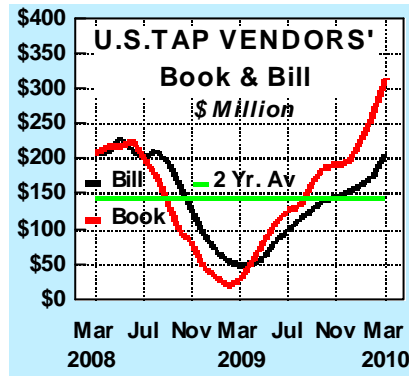
But, that's just my opinion



### March TAP B/B at 1.51

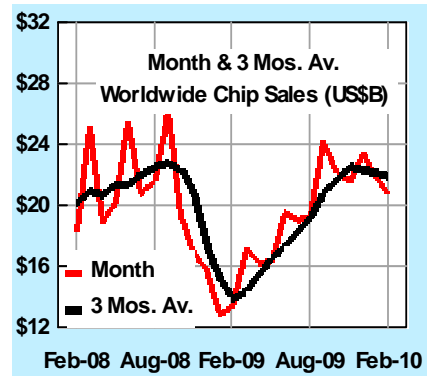
SEMI said No. American chip equipment suppliers reported \$1,285.1 million in bookings (three-month average) for March, up 2.7 percent from the final February bookings of \$1,251.2 million and up 423.3 percent YoY. Billings were \$1,081.6 million, up 6.4 percent MoM and up 146.8 percent YoY. The March 2010 total equipment B/B was 1.19

Front-end equipment bookings were \$967.7 million, down 2.3 percent MoM, but up 348.4 percent YoY. Billings were \$871.5 million, up 3.5 percent sequentially and up 123.9 percent YoY. The resulting Front-end equipment book-to-bill was 1.11.



Test, Assembly and Packaging equipment (TAP) bookings were \$317.4 million in March, up 21.5 percent compared to the \$261.2 million reported in February, and up 961.85 percent from 29.8 million in March 2009. March billings were \$210.1 million, up 20.4 percent from \$174.5 million in February and up 328.8 percent from \$49.0 million in March 2009. The March 2010 TAP equipment book-to-bill was 1.51.

TAP Book-to-Bill			
	\$ Million		
	Feb'10	Mar'10	Mar'09
Book	\$261.2	\$317.4	\$29.8
Bill	\$174.5	\$210.1	\$49.0
B/B	1.50	1.51	0.61



### Feb. Actual Chip Sales up 54.6% YoY

The WSTS said actual (not 3-month avg.) global chip sales in February were \$20.79 billion, up 54.6 percent YoY, but down 4.9 percent from its revised \$21.85 billion for January. (It had originally reported January '10 actual sales as \$22.38 billion.)

February 2010 set a new revenue record for that month, topping the old record set in 2006 by 11.8 percent. Even after adjusting January 2010 revenue down by \$530M, or 2.4 percent it still beat the old record for the month of February, set in 2007, by 13.2 percent.

The floating Chinese New Year holiday normally results in lower chip sales in the month it occurs. This year it moved from a January event in 2009 to a February event in 2010,

In addition, the WSTS admitted that there was a major error in its January chip sales data - which it corrected in its February report. It was mainly in a single chip category - Microprocessor Units (MPUs). The MPU data originally reported for January was reduced by 15.9 percent in the February release. Interestingly, there was no change made to the MPU unit data. As a result, the originally MPU ASP data for January dropped from \$90 to slightly under \$76.

The other revenue correction made by the WSTS was a 1.8 percent downward adjustment to discrete semiconductor revenue. The WSTS lowered discrete unit volume for January 2010 by roughly a billion units or about 3.2 percent.

### February 2010 WW Chip Sales

The SIA reported that three-month average worldwide chip sales in February were \$22.0 billion, down 1.3 percent from January when sales were \$22.3 billion, but up 56.2 percent from February 2009 when sales were \$14.1 billion. "The February sales numbers reflect continued recovery of sales of semiconductors, with demand principally driven by growth in sales of electronic products in emerging economies," said SIA President **George Scalise**. "Unit sales of the two leading chip demand drivers - PCs and cell phones - are projected to grow in the low- to mid-teens in 2010. There are encouraging signs that the global economic recovery will continue, and we remain cautiously optimistic that there is upside potential for growth beyond our November forecast for 2010."

#### 3-Mo. Avg. US\$Billion

Market	MoM			YoY	
	Jan'10	Feb'10	Change	Feb'09	Change
Americas	\$3.75	\$3.61	-3.7%	\$2.44	47.8%
Europe	\$2.93	\$2.88	-1.8%	\$2.11	36.5%
Japan	\$3.47	\$3.44	-1.1%	\$2.78	23.7%
Asia-Pacific	\$12.17	\$12.11	-0.4%	\$6.78	78.6%
World Total	\$22.32	\$22.04	-1.3%	\$14.11	56.2%

**ATE STOCKS**

Ticker	Close Change		52 Week	
	04/30	Month	High	Low
AEHR	\$2.93	9.2%	\$2.82	\$0.75
ATRM	\$3.43	10.6%	\$3.35	\$0.99
ATE	\$25.86	3.1%	\$28.36	\$14.85
CSCD	\$4.81	15.9%	\$5.59	\$2.40
COHU	\$16.14	17.2%	\$14.89	\$7.00
ESIO	\$13.77	7.5%	\$14.60	\$5.71
FORM	\$15.00	-15.5%	\$26.08	\$14.82
INTT	\$3.27	107.0%	\$2.26	\$0.11
KLIC	\$8.18	12.8%	\$7.67	\$2.45
LTXC	\$3.41	13.3%	\$3.25	\$0.20
TER	\$12.23	9.5%	\$11.57	\$4.12
VRGY	\$11.92	6.6%	\$13.75	\$7.93
<b>Avg. Change</b>		<b>16.4%</b>		

**EDA STOCKS**

Ticker	Close Change		52 Week	
	04/30	Month	High	Low
CDNS	\$7.45	11.7%	\$8.18	\$4.05
MENT	\$8.99	12.1%	\$9.73	\$4.16
SNPS	\$22.66	1.3%	\$23.74	\$17.83

**Gartner's Top 10 Eqpt Suppliers in 2009**

*Note: In the April '10 issue of The Final Test Report we published VLSI Research's version of this "Top 10" Rankings. However, last month Gartner released its version. As it differs from VLSI's list, we are publishing it as well.*

Only three equipment companies had sales greater than US\$1 billion, compared with six in 2008 and ten in 2007, according to Gartner. Despite a 38 percent decline in revenue in 2009, Applied Materials increased its worldwide market share to 15.1 percent, compared to 13.2 percent share in 2008.

The biggest loser was lithography leader, ASML, which saw its revenue decline 54.1 percent with revenue of US\$1.6 billion compared to US\$3.5 billion in 2008. As a result the company dropped one ranking position to third, according to Gartner.

However, despite a revenue decline of 52.1 percent in 2009, TEL overtook ASML for second position behind Applied Materials. TEL had a 9.9 percent market share with revenue of US\$1.65 billion in 2009, down from US\$3.4 billion in 2008.

Lam Research, KLA-Tencor and Nikon saw revenue declines in the 40 percent range, while ASM International and Novellus Systems revenue declined in the 30 percent range. Dainippon Screen (DNS) had the honor of the least decline in revenue amongst the top 10 equipment suppliers. DNS saw revenue decline only 23.7 percent to US\$635.2 million, down from US\$832 million in 2008.

"In the memory sector, continuing losses resulting from plunging prices drove memory CAPEX down 54 percent from an already depressed 2008 level. Logic and mixed-signal spending declined 26 percent as chip makers concentrated on technology upgrades to the next line width to position themselves for the recovery," Freeman said. "By the end of the year, the major companies resumed spending. We expect this trend to continue in 2010, with technology upgrades accounting for the majority of spending — at least through the first half of the year."

**Top 10 WW Chip Eqpt. Vendors by Revenue (US\$ Million)**

09 Rk.	Company	09 Rev.	YoY
1	<b>Applied</b>	2535.2	-38.0%
2	<b>TEL</b>	1652.8	-52.1%
3	<b>ASML</b>	1616.6	-54.1%
4	<b>KLA</b>	939.5	-46.9%
5	<b>Lam</b>	863.1	-42.5%
6	<b>Nikon</b>	786.6	-41.0%
7	<b>Dainippon</b>	635.2	-23.7%
8	<b>ASM</b>	547.8	-30.4%
9	<b>Novellus</b>	440.3	-37.4%
10	<b>Teradyne</b>	396.5	-51.9%
	<b>Others</b>	6363.8	-48.1%
	<b>Total</b>	16777.4	-46.0%

Source: Gartner April 2010

**FINANCIAL REPORTS****Advantest Corp.**

FQ4 Ending March 31 (\$000).

	2010	2009
Sales	\$236,906	\$102,663
Net	14,325	(686,559)
Orders	253,434	52,401
FYr. Ending March 31 (\$000)		
	2010	2009

Sales \$572,700 \$762,526

Net (123,245) (745,117)

Orders. 728,450 498,390

**Aehr Test Systems, Inc.**

FQ3 Ending Feb. 28: \$000

	2010	2009
Sales	\$2,453	\$1,235
Ops. Pft.	1,484	(24,012)
Net	1,535 \$	(27,680)
Per shr.	0.18	(3,28)

**COHU, Inc.**

FQ1 Ending March 27: \$000

	2010	2009
Sales	\$64,830	\$36,582
Ops. Pft.	1,471	(9,615)
Net	907	(6,262)
Per shr.	0.04	(0.27)

**FormFactor, Inc.**

FQ1 Ending March 27: \$000

	2010	2009
Sales	\$39,666	\$27,369
Ops. Pft.	(38,836)	(51,778)
Net	(38,184)	(37,943)
Per shr.	(0.77)	(0.77)

**Teradyne, Inc.**

FQ1 Ending April 4 : \$000

	2010	2009
Sales	\$329,623	\$120,608
Ops. Pft.	60,001	(93,415)
Net	50,100	(90,668)
Per shr.	0.24	(0.53)
Orders	\$534,400	\$136,346

## TAP Cos. CQ1'10 Repts

As noted in the front page story of this issue, most major TAP companies reported GAAP profits for the first calendar quarter of this year. However, FormFactor was the exception, although it expects that moving its manufacturing to Asia will improve its results in the future.

### FormFactor Inc.

Reported revenues for its first quarter, ended on March 27, 2010 were \$39.7 million, up 20.2 percent from \$33.0 million in the fourth quarter of 2009, and up 44.9 percent from \$27.4 million in the same quarter of 2009. It loss for the quarter was \$38.2 million or \$0.77/share, compared to a loss for the fourth quarter of 2009 of \$28.0 million or \$0.56/share and a loss for the first quarter of 2009 of \$37.9 million or \$0.77/share. On a Non-GAAP basis, its loss for the quarter of fiscal 2010 was \$29.4 million or \$0.59/share. The quarter's results include pre-tax restructuring charges of about \$3.6 million which is associated with one-time severance benefits related to its manufacturing expansion to Singapore, which it expects to result in cost benefits by the first quarter of 2011.

"Increasing design activity and volume purchases in memory applications are having a positive impact on our revenues," said Mario Ruscev, CEO of FormFactor. "The transitions to DDR3 and to smaller technology nodes continue to gain momentum. Our focus is on customer qualification of our new products - including its *TouchMatrix* and *SmartMatrix probe* cards which are now shipping in volume, it said." It noted that it has opened its new wafer probe card manufacturing facility and global business center in Singapore. As a result, it will reduce its U.S. headcount by about 106 employees, and shift those jobs to Asia by the end of the first quarter of fiscal 2011.

It also expects to record charges of about \$1.1 million in the second through fourth quarters of fiscal 2010 associated with retention bonuses.

"This reduction in force initiative represents a continuation of our global regionalization strategy to place more decision-making close to our customers and strengthening our local design, application, and service capabilities to improve customer responsiveness" said Ruscev

"Toward these goals, we are moving from Livermore to Korea and Japan certain assembly and test operations from our back-end manufacturing processes and are bringing up and plan to qualify our back-end manufacturing operations in Singapore in the third quarter of fiscal 2010," he said.

A few years ago FormFactor was the star in advanced probe cards, but recently, the company has been hit hard by the ATE downturn and product miscues. As a result there have been a string of losses, layoffs and management changes at FormFactor.

### Cohu, Inc.

Reported 2010 first quarter sales of \$64.8 million and net of \$0.9 million or \$0.04/share. The Company also reported non-GAAP results, with first quarter 2010 net income of \$3.1 million or \$0.13/share. It was the company's third consecutive profitable quarter on a Non-GAAP basis.

Cohu said that sales of semiconductor equipment accounted for 86 percent of fiscal 2010 first quarter sales. Orders were \$81.8 million for the quarter. Up from \$68.8 million for the fourth quarter of 2009. Orders for semiconductor equipment were \$74.7 million in the first quarter of 2010 compared to \$60.0 million in the fourth quarter of 2009.

James A. Donahue, its chairman/CEO/president, stated, "Cohu achieved a third consecutive quarter of non-GAAP profitability and was also profitable on a GAAP basis in the first quarter of 2010.

Sales for the quarter exceeded our previous expectations, as a result of higher revenue in our test handler operations, due in part to the recognition of additional deferred revenue on new test handler products that gained customer acceptance during the first quarter."

Semiconductor equipment orders were at the highest level since the first quarter of 2000. Unit orders for test handlers in Q1 increased 42 percent sequentially and a remarkable 650 percent YoY. Demand was strong for all major handler products. Rasco had another excellent quarter, including record quarterly orders, supporting our view that Rasco is gaining market share in the gravity and test-in-strip handler markets."

### Aehr Test Systems

Said its sales for its third fiscal quarter of 2010, ended February 28, 2010, were \$5.2 million compared with \$1.2 million in the third quarter of fiscal 2009. Its net for the quarter was \$1.5 million, or \$0.18 /share, compared to a net loss of \$27.7 million, or \$3.28/share, in the same quarter of fiscal 2009, which included charges of \$25.3 million, or \$3.00/share, related to the Spansion bankruptcy filings in February and March 2009.

However, the company noted that product sales in the quarter were just \$2.5 million, and the balance was due to the \$4.6 million in proceeds received from the sale of the remainder of the Spansion U.S. bankruptcy claim, Excluding the benefit of the cancellation charges of \$2.7 million related to the bankruptcy claim, product sales of \$2.5 million were up 49 percent on a sequential quarter basis in the quarter.

It noted that the \$2.5 million in revenues did not include the FOX-15 system it shipped to Micronas in the previous quarter. It said that even though the system is running production wafers, the customer has not completed the formal acceptance process - now expected during the present quarter, it said.

At February 28, 2010, its cash and cash equivalents were \$8.7 million and include the proceeds of approximately \$4.6 million from the sale of the remainder of the bankruptcy claim against Spansion. Aehr Test completed the third quarter of fiscal 2010 with no outstanding debt and shareholders' equity of \$11.8 million, or \$1.37/share .

## FOCUS ON Teradyne



**T**eradyne reported that it was off to a strong start in 2010. The global leader in the semiconductor test equipment sector reported first quarter earnings that beat the Consensus estimate by \$0.08/share. (The company has a history of positive surprises, as evidenced by the net positive surprise of 12.75 percent in the four preceding quarters.)

Teradyne's revenue of \$329.6 million beat the Consensus by 9.1 percent, growing 23.4 percent sequentially and 173.3 percent YoY. It was also well over its guided range of \$290-310 million. Its revenues have been growing strongly over the past four quarters, although the triple-digit year-over-year growth was the first in this cycle. \$290 million was in Semi Test and \$40 million in Systems Test.

Memory test accounted for just 5 percent of its Semi Test revenue. Semi Test service revenue was \$44 million. Its product turns business was 37 percent versus 30 percent a quarter ago. Semi Test product turns business was 39 percent versus 35 percent in the previous quarter. Memory test revenue was \$16 million in the quarter, down from \$18 million sequentially.

Revenue was driven by strength in Asia' excluding Japan increasing 39.4 percent and Japan increasing 23.4 percent sequentially. The U.S. and Europe declined 11.1 percent and 4.0 percent, respectively.

Orders were up 76.5 percent sequentially and 291.9 percent YoY. The sequential increase was driven by both Semiconductor and System segments, which increased 74.5 percent and 90.1 percent, respectively. Consequently, its B/B jumped from 1.13 in the Dec 2009 quarter to 1.62 in the quarter.

Teradyne expects the present quarter to be even stronger. Its guidance for the second quarter of 2010 is revenue of \$390 million to \$420 million. It expects a non-GAAP operating profit rate of 25 percent to 27 percent, which would be its highest operating profit rate in ten years.

Mike Bradley, Teradyne president/CEO, noted that, "There are a number of things contributing to our strong showing; first of all the utilization remains very high for our leading edge products. Device unit volumes are increasing and the appetite for testers that are for high performance and high productivity is on the rise."

In addition he said, "During the downturn, many older generation testers were permanently decommissioned, and as the market has recovered customers are buying new capability for the future rather than bringing old testers back in production. We've seen evidence of this in our higher end in our UltraFLEX system sales where more than half of the testers ordered in the first quarter included new options were introduced since mid 2008."

Teradyne said it saw record demand for the J750 - which accounted for 13 percent of its semi test revenue and there were over 150 units ordered in the quarter - over a third of which were for the company's latest addition to that platform, the J750EX. It claims "the EX improves throughput and doubles the 750's operating frequency giving customers better economics and additional performance headroom for the micro-controller and wafer sort application."

Also, its Eagle ETS88 introduced last year, targeting the cost sensitive segment of the analog market, had record bookings in the quarter.

It said the technology segments driving the first quarter's strong demand were wireless, power management and our continued resurgence in micro-controller tests which had started to pick up in the fourth quarter and continued to expand throughout this first quarter. But, demand was still subdued in the image sensor and LCD driver segments.

Bradley also said that. "The memory test market is not on the same recovery trajectory as SoC. Nevertheless, we've seen our best results in the last two years, but in the context of a market that is only slowly starting to increase CapEx outlays. Both our Magnum products for low speed memory test and our UltraFLEX-M for high-speed memory saw sequential order increases in the quarter, but in comparison to SoC, the memory market is still lagging."

Bradley also claimed that, "Over the last four years ended in 2009, the SoC test market has averaged about \$2.5 billion. So we feel that two billion is a prudent market size to plan for a mid cycle profitability. Equally important, is that our earnings leverage, when the SoC market is more than two billion dollars or if we gain a few additional points of SoC share, is very attractive as about 50 percent or more of the incremental sales drops to our operating profits."

The major factor remains the size of the SoC test markets, given our greater than 40 percent and growing share. if we go back three or four years we were mid-30s in share and moved that up in '08 to just over 40 percent and held our share in 2009 around 41 percent share in SoC."

Teradyne said that it is doing some selective hiring, mostly in the distribution arena and are utilizing some contract talents in strategic product development areas. Its headcount at the end of Q1 was 2,900. It said that, "In spite of the surge, we were able to keep our SoC test lead times in the first quarter to an average of about ten weeks, but we remain in a war room mentality until we are back to our normal of six to eight weeks."

## More Consolidation/ Mergers of TAP Cos.

The consolidation of the ATE and Test/Assembly sectors continued last month. Carlsbad, CA-based KVD Company was acquired by Hsinchu, Taiwan-based STAr Technologies and Chandler-based Dynamic Test Solutions (DTS) will merge with Bangalore, India - based Tessolve Services. All four companies are privately-held and no financial details were released on either transaction.

### STAr/KVD



On April 15, STAr Technologies announced its acquisition of KVD, a supplier of 'cost effective' ATE for

linear, power management and low cost mixed signal IC test. "KVD will become a wholly owned subsidiary of STAr, with STAr to provide KVD with the financial strength to further its technology capabilities and global presence," it said.

KVD was founded in 1987 by Veets Veitas, its CEO and Peter deHollan, its president. Both had been with Axiom



Technology until just before that company

was acquired by STS in 1988. (STS also acquired ASIX Systems in 1989 and became Credence Systems in 1990.). In 1994, KVD entered the ATE system market and now claims 200 systems installed to-date.

The two companies had been collaborating on sales and engineering since 2007. According to Veitas that had led to the adoption of KVD's technology by a major Taiwan power management IC design house. He added, "We look forward to working with the STAr team to penetrate new customers with our technology."

STAr was established in August 2000 and is headquartered in Hsinchu City, Taiwan with offices across Asia. It provides software, test equipment, consumables and service for wafer-level and package-level reliability, assembly and packaging.

STAr has been moving to become a total solution supplier for semiconductor test systems and probe cards. It has been supplying full range of probe cards since it acquired GTA Electronics in April, 2009. "With the addition of KVD, STAr completes its test systems offering from front-end fab processes to back-end wafer sort and final tests," claimed Dr. Choon-Leong Lou, CEO of STAr Technologies.

"We expect the combination to drive efficiencies associated with operating a large business and enabling STAr to expand into the US markets through KVD with a broader portfolio of products" noted Tom Wang, Chairman of STAr Technologies. "STAr's goal of building a robust and efficient infrastructure with great products and services will present us with greater growth opportunities in the future. We believe that merger with KVD will increase our competitiveness, widen our reach to the international market and achieving higher growth and profits in the near future."

### Tessolve/DTS



Tessolve Services and Dynamic Test Solutions (DTS) are set to merge into a new privately-held company, Tessolve-DTS. It is expected to be one of industry's largest and most integrated test services suppliers with more than 400 employees in more than 20 global locations. The combined company will be headquartered in Bangalore, India with US operations in Chandler, AZ.

Tessolve Services has recently received Series C round of venture funding from Reliance Venture Asset Management. Tessolve's other investors include Jafco, Applied Materials, Qualcomm and ST Asset Management (Singapore).

It was founded in 2003 by P. Raja Manickam. He started his career at Texas Instruments as a test engineer.

He later held the same position with Fairchild National Semiconductor. He also worked at DTS and Viko Test Labs and was involved in the early start up of STATS and UTAC.

Jill Johnston founded DTS in 2003 with a focus on developing hardware test solutions for semiconductor companies and has developed custom package test and wafer probe load boards, probe card PCBs, as well as custom tester solutions. Its customers include Texas Instruments, STMicroelectronics and Qualcomm. DTS has test services facilities in 16 locations around the world, including key locations in Europe, Asia and the US.

Johnson commenting on the merger, said, "Separately both Tessolve and DTS have built successful companies in their respective areas of expertise in test solutions. This is a logical evolution that builds on our individual success, as well as the strong working relationship we have formed over the past few years.

Combined, we can offer a much more robust and efficient way to serve global companies. Our deep experience across the entire test process, combined with our global infrastructure of service and support, will uniquely position us to capitalize on the continuing move by IDMs and fabless companies to leverage the cost and time to market benefits of outsourced test services."

She added, "The two companies have established a close working relationship for the past several years and have many mutual customers. Because of their unique areas of expertise in test solutions, there is very little overlap between the two product lines and organizations and few, if any, personnel cuts are expected.

The new company's infrastructure is anchored by a 50,000 square foot testing facility in Bangalore and it includes an extensive network of engineering facilities around that world that support and use a broad range of commercial testing equipment and software, that ensures full compatibility with their diverse customer base."

## “Lite” Applications Engines Speed Delivery of Advanced Adaptive Test Solutions

By *Debbora Ahlgren, VP, Sales & Marketing, OptimalTest*

Shrinking chip geometry’s present various kinds of test challenges, not the least of which is rendering defects unobservable, resulting in a lack of coherence between what was designed and what is fabricated. The ability of various techniques (including IDDq) to identify these failures are less than foolproof. At the same time, chip quality is becoming a prominent issue. Always important to the automotive industry and now in high consumer awareness given Toyota’s recent problems, chip quality (“no failures”) are escalating in importance in consumers’ minds. Quality is also a growing issue in other chip applications, such as handset quality, where quality equates to availability and mission-criticalness as defined by the consumer.



**Debbora Ahlgren**

Major IDMs are addressing the issues of quality and improved outlier detection. However, their methods are designed and applied as “in-house” fixes and are proprietary; they are therefore limited. They are also ill-suited to a world where design and manufacturing are infrequently completed within the same enterprise.

The other major issue that must be balanced against the drive for quality and reliability is the pressure to keep costs low. Three trends have emerged that address these challenges: 1) the acceleration and expansion of Statistical Process Control (SPC) and Automated Process Control (APC) methods to back-end processes such as test; 2) the emergence of third-party software - equipment, platform and device agnostic as well as flexible, scalable, easily integrated across enterprises and 3) delivery of software applications and tools via low-cost expert engines.

The more far-ranging application of SPC and APC is due to more widespread sophistication about web-driven technological tools – such as algorithms applied by expert engines; partly by appreciation of enterprise architecture; and partly an evolution in adaptive testing techniques beyond Test Time Reduction (TTR) and Parts Average Testing (PAT). Thanks to such knowledge migrating to the semiconductor industry – including test engineering – there is better understanding of the importance of a rich and up-to-date algorithm library for applying SPC tools to every facet of test, from TTR to reliability to quality, including cross-process and cross-entity “health checks.” OptimalTest has capitalized on this methodology’s migration to test by the building of a test architecture incorporating state-of-the-art database technology, data formatting, and comprehensive and deep networking and integration.

The development and adoption of SPC and APC for test is now widely available – and available across separate corporate entities and enterprises – through third-party software developers such as OptimalTest. Vendor-agnostic test management and optimization software is subtly shifting the role of test and of the tester.

Deployed on a variety of ATE platforms as well as across corporate entities, such software contributes a new standard of test management and optimization for not only processes and products, but also test equipment and operations, thereby bringing vastly improved ROI to test.

The software is the key value-add in a modern test scenario and in fact, is now being implemented on multiple vendor platforms in various geographic sites to bring significant leaps to quality, reliability, efficiency and other improvements, a very gratifying return on investment for users.

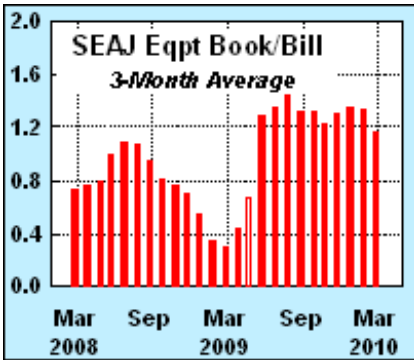
The role of test and test data – analyzed, shared, re-analyzed and processed across the entire IC life cycle – therefore is elevated to a lifeline of information that runs across the entire design-to-manufacture process.

The power of such an advanced adaptive test solution driven by sophisticated SPC and APC can be tapped into easily and rapidly via a “lite” expert engine, which delivers the applications, tools and technology architecture of the software. The expert engine can be deployed on multiple platforms, ready to be activated by solutions in a scalable manner. For example, a test house can install such an engine until called upon by a partner to implement a solution and can subsequently add solutions in a scalable manner.

A software-only engine of this kind can deliver accelerated early detection of process, product and equipment issues; can enable near-time, data-driven decision-making by design, product and yield teams overseeing remote test floors in any geographic region and from any source of wafer or final test data; can enable real-time applications such as outlier detection. In addition, there is no need to revise and re-document how test operations are run.

While the ITRS lists station controllers as a key building block for adaptive test and while they are necessary for certain test situations, all-software analysis engines that can execute algorithms as well as communicate data across processes, equipment and locations are more than adequate for test optimization and are deployable in a matter of days at very low cost. Such a software “enabler” is gaining acceptance now as the industry begins to understand it can easily deliver powerful software test solutions across disparate ATE platforms and business models/partner chains, with differentiated value propositions for each one.

Further, such a “lite” alternative can deliver test results from across distributed global operations and value-chain partners in minutes rather than days, giving central semiconductor partners visibility into test processes on a near-time basis and giving test partners immediate operational information to make efficiency improvements.



### Japan's March Chip Eqpt. B/B at 1.17

The SEAJ said that Japan-based chip equipment makers posted orders of ¥97,179 million (US\$1,072.421 million) in March 2010 (three-month average), up 12.6 percent from the February 2010 level of ¥86,296 million and up 617.2 percent from March 2009 bookings of ¥13,551 million.

Billings in March 2010 were ¥83,314 million (US\$919.413). The billings figure is up 28.9 percent up sequentially from ¥64,610 million and up 87.3 percent from the March 2009 billings level of ¥44,475 million.

The SEAJ's resulting book-to-bill for March 2010 was 1.17.

### JAPANESE ATE STOCKS

INDEX	Ticker	Close	Change
		04/30	Month
NIKKEI 225	N225	11,057	0.2%
Advantest	6857	2,451	4.8%
JEM	6855	654	6.3%
MJC	6871	1,525	-6.3%
TEL	8035	6,210	0.2%
TSK	7729	1,615	0.1%
Yokogawa	6841	806	-1.0%
Average change in Mar.			0.7%
Yen/US\$		93.850	6.2%

### Advantest Returns to Profitably in FQ4'09

Advantest reported that it had returned to profitability in the final quarter of its fiscal year, ended March 31, 2010. It was the company's first profitable quarter since its FQ3, ended December 30, 2007. It reported that its sales for its latest quarter were ¥21.5 billion (US\$236.9 million.) Its net for the quarter was ¥1.3 billion (US\$14.3 million.) Its orders for the quarter were ¥23.0 billion (US\$253.4 million.)

For its full fiscal year 2009 its sales were ¥53.23 billion, (US\$572.2 million), down 30.6 percent YoY. Its net loss for the full year was ¥11.5 billion (US\$123.2 million.). Orders for fiscal 2009 were ¥67.7 billion (US\$728.4 million), up 35.1 percent YoY.

Its sales by product in fiscal 2009 were: Memory testers - ¥12.4 billion (US\$133.4 million), down 29.5 percent YoY; Non-Memory testers - ¥20.2 billion (US\$217.4 million), down 36.1 percent YoY; Handlers & Interfaces - ¥11.0 billion (US\$118.6 million), down 23.5 percent YoY and Services & Support - ¥11.8 billion (US\$127.0 million), down 17.8 percent YoY.

Orders by product for the year were: Memory testers - ¥14.5.0 billion (US\$156.0 million) up 59.3 percent YoY; Non-memory testers - ¥28.0 billion (US\$301.3 million), up 64.7 percent YoY; Handlers & Interfaces - \$14.8 billion (US\$159.3 million), up 62.6 percent YoY. Service and support - ¥13.0 billion (US\$139.9 million), down 16.7 percent YoY.

Region	Revenue	YoY
Japan	129.1	-51.4%
Americas	52.7	-58.5%
China	50.6	-25.4%
So. Korea	110.8	-27.0
Taiwan	137.7	5.5%
Other	91.8	-11.5%
<b>Total</b>	<b>572.7</b>	<b>-30.6%</b>

It noted that in 2000 it had approximately 10 customers in China. Now that number has grown six-fold in the last decade, thanks to increasing investment by foreign chipmakers, a flourishing local semiconductor industry and the shift from the coasts to the inland regions.

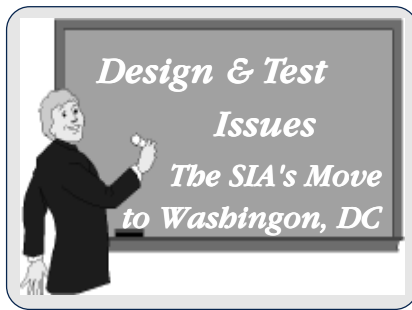
It said that the recent growth of its T2000's worldwide customer base reflects rising tester demand in the emerging economies. The Asia-Pacific region, led by China, now accounts for the largest proportion of T2000 customers.

Advantest also said that in its component test segment, orders improved significantly. Sales remained weak, due to the impact of weak orders in the second half of FY2008. In the Memory sector the company was mired in an extremely challenging environment at the beginning of the period, as memory makers continued to take a cautious stance on capital expenditures. However, the upturn in PC shipments left manufactures struggling to keep up with demand, sparking fears of DRAM shortages. Prices for DDR3-DRAM and other DRAM devices rose, encouraging memory makers to resume capital expenditures, which led to a jump in orders for memory test systems toward the end of the period.

In non-memory, orders for MPU test systems continued to be robust. Demand for LCD driver IC test systems and consumer SoC test systems also expanded in the second half of the period, as global recover stimulated demand for consumer electronics, including LCD TVs, cellular phones and notebook computers.

Demand for Advantest handlers also improved sharply during the second half of FY'09, supported by increased activity in the DDR3-DRAM and analog IC markets.

It said that it remains difficult to predict whether the momentum of capital expenditures will be sustained. In this environment, Advantest said is unable to provide a detailed forecast for the fiscal year ending March 31, 2011 at this time.



The Semiconductor Industry Association (SIA) announced last November that it will close its headquarters office in Silicon Valley at the end of this year and also will say good-bye to its president, of the past 14 years, George Scalise.



George Scalise

He is expected to be replaced by a new leader, probably in August. Rick Merritt of *EE Times* discussed both moves and the 'whys' with Scalise last month.

Scalise said "I think more than anything else what it [the move] says is there is more activity in Washington at the legislative and regulatory levels that could have increasing impact on the industry, and we have to spend more time in Washington dealing with these issues."

He added that, "also, Silicon Valley is no longer a center for chip making, but more the home of big systems and software companies such as Cisco and Google who are not represented by the SIA."

Scalise added that "there's very little semiconductor manufacturing in California anywhere which is a shame because there's no reason it couldn't be here and be cost effective. But, there has never been enough interest from local and state governments to look at the issue and decide what we need to do attract new investments. They are losing a lot of manufacturing that could be here if they were more aggressive. The U.S. has to learn we have to compete for investment. We also need more funding for basic [semiconductor] research.

We also need immigration reform to let foreign-born students go to school here and stay on and work and become citizens. And we need government to be more aggressive in competing with foreign countries in investment.

Wafer fab in US continue to be competitive with any country in the world. The only thing that alters that level of competition is the tax policies, incentives and grants provided to go there rather than invest here. Washington has to realize [economic policy] is about more than international trade, it's about competition for investment and we have to have policies to make it attractive for U.S. and foreign companies to invest in the U.S."

Scalise said, Going forward the SIA's primary goal must be to keep the U.S.-based semiconductor industry successful competing in world market. We've done that extremely well with the U.S. representing now more than 50 percent of the worldwide market as of last year. It must continue to fund research to solve problems that could slow Moore's Law with groups like Sematech and the Semiconductor Research Corp.

In the 1980s the SIA addressed problems of [chip] dumping and market access in Japan. It opened an office there to build better relationships and resolve problems. It actually closed the Japan office a few years ago. Now it must accomplish similar problems with China.

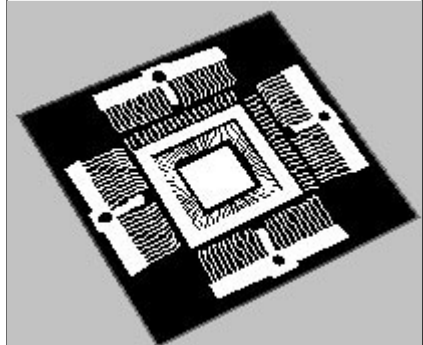
The SIA established an office in China five years ago and established outstanding relationships with leaders in the federal government and mayors of largest cities. Structurally it must handle China the same way as it did Japan. Its attitude has always been one of getting engaged so when something comes up we can talk in rational ways with people we know and who know us. So when issues about value-added taxes came up in China it only took a couple months to resolve them because we have those good relationships and we approach things in a business-like way."

Asked if the SIA has lost its clout as voice of Silicon Valley and electronics as the semiconductor industry moves to a fabless model and groups like the Global Semiconductor Alliance have grown? Scalise said, It has not. The GSA is in a whole different arena. The SIA funds research at the level of \$100 million a year."

Asked to describe the kind of person he wants to see become the next SIA president, Scalise replied that person needs to have industry experience and experience dealing with Washington. He, or she, must be an effective consensus builder. "If you can do that, you can do anything," he said. "We expect the search firm to be finished with its work in the next 30-45 days. Then we'll sift through candidates to a group that will be interviewed in late May and June."

With regard to his personal plans for the future, Scalise said, "I plan to stay active. I am on the board of three companies and will probably go on a couple more. I'll do more writing on what I've learned in 50 years. I'll probably do some consulting. And yes, I'll play more golf."

## ATE/DFT MEETINGS



**SW Test Workshop**  
6-9 June 2010  
Rancho Bernardo Inn  
San Diego, CA  
<http://www.swtest.org>

**Semicon West 2010**  
13-15 July 2010  
Moscone Center  
San Francisco, CA  
<http://www.semiconwest.org>



## INDUSTRY

The **SEAJ** said that Japan-based Test, Assembly and Packaging (TAP) equipment makers reported three-month average orders of ¥19,135 million (US\$ 211.54 million) for February. That was up 2.1% sequentially and up 729% YoY. The SEAJ's resulting TAP book-to-bill for February was 1.38.

**VLSI Research** said IC inventories reached \$24.38 billion worldwide in February, a 46% increase from the same month in 2009. On the other hand, analog, discrete and memories are in tight supply, it said.

The **EDA Consortium** (EDAC) Market Statistics Service (MSS) announced that the Electronic Design Automation (EDA) industry revenue for Q4 2009 was \$1,262.7 million, an 8.1% sequential increase from Q3. On a Q4/Q4 basis, EDA industry revenue declined 4.2%, compared to \$1,318.7 million in Q4 2008. The four-quarter moving average declined 9.5%.

## COMPANIES

**Verigy** said it had shipped "multiple" V93000 Port Scale RF systems to a 'repeat customer' for testing radio-frequency system-on-a-chip (RF-SoC) semiconductors used in ultra-low-cost wireless handsets.

**LTX-Credence** said that **u-blox**, a Thalwil, Switzerland-based fabless provider of embedded positioning and wireless communication solutions has selected its X-Series as their next-generation RF test platform at its Asian OSATs.

**Cadence Design** reported Q1'10 revenue of \$222 million, compared to \$206 million for the same period in 2009 and a loss of \$12 million, or \$(0.04) compared to a loss of \$63 million, or \$(0.25) per share in the same period in 2009.

**Amkor's** first-quarter revenue increased by 66% YoY to US\$646 million and net of US\$44 million, or \$0.24/share, compared to a loss of \$0.12 for the same time last year.

**STATS ChipPAC** posted Q1'10 revenue of \$387.9 million up 75.9% YoY, but down 1.7% sequentially. It's net for the quarter was \$27.5 million or \$0.01/share.

## PEOPLE

**Jeff Killian**, its Director of Finance, was named CFO at **Cascade Microtech**, replacing **Steven Sipowicz**, who has resigned. Killian joined Cascade Microtech in June 2008 and most recently led the successful acquisition of **Suss MicroTec's** Test Systems Division.

**Dr. Wilmar (Bill) Bottoms**, has been named to the board of **Alchimer S.A.**, a Massy, France - based provider of nanometric deposition technology for semiconductor interconnects and through-silicon vias. He is most recently the founder/chairman/CEO of **Third Millennium Test Solutions** (3MTS).

**Henry Edward Roberts**, a developer of an early PC, a "build-it-yourself kit" the **MITS Altair 8800**, died last month in Georgia. He was 68. It inspired **Bill Gates** and friend **Paul Allen** to come up with **Microsoft** in 1975 after they saw an article about it in *Popular Electronics*.

**Paul Otellini**, president/CEO of **Intel** received about \$14.1 million in total compensation for 2009, an increase of 16.7% from he was paid in 2008, according to documents filed with the **SEC**.

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