



# **FTR** THE FINAL TEST REPORT

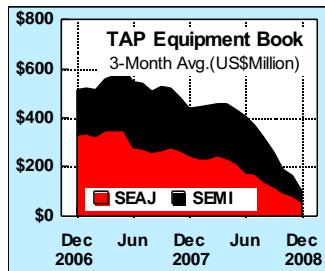


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## Was December the Bottom – or is the Worst Still to Come?

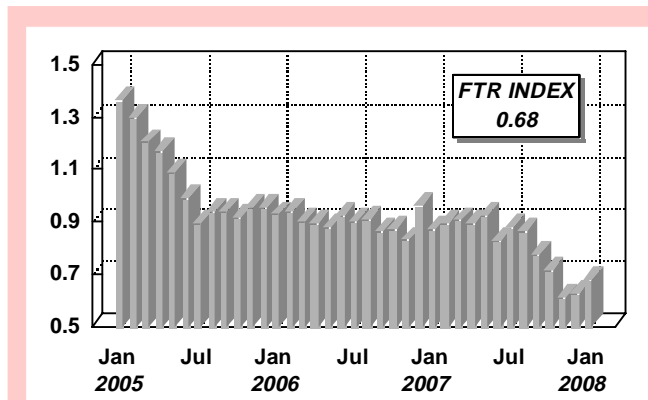
**G**lobal Test, Assembly and Packaging (TAP) bookings continued their fall off the cliff in December 2008 for TAP vendors in both the U.S. and in Japan, as the graph below shows. SEMI said that North American TAP equipment makers reported preliminary three-month average bookings of just \$47.3 million for December – the lowest, even in absolute dollars, since SEMI began reporting equipment bookings and billings in late 1992 – compared with the \$81.5 million reported in November and \$94.3 million in October. The December data would suggest that No. American TAP equipment bookings for all of Q4'08 were in the range of just \$140 million. (Probably a bit less as SEMI's number is a 'rolling average'). One year ago, TAP bookings in December had been \$239 million or around \$720 million for Q4'07. No. American billings for December were \$92.8 million for a book-to-bill ratio of 0.51 – its lowest reading since November 2001.



However, they were renewed at lower than historical values due to low equipment utilization rates at both IDMs and the OSATs.

As shown in the graph at left the situation was no better for Japan's TAP vendors that reported three-month average bookings of just \$52.9 million, down 78.4 percent YoY in yen value. (The SEAJ, which provides 'actual' monthly bookings, said actual TAP bookings in December were just \$36.2 million, down 84.7 percent YoY in yen. The SEAJ's book-to-bill (three-month average) was 0.66.

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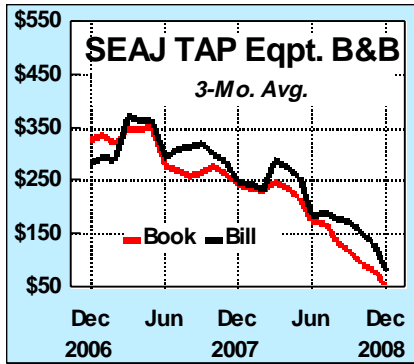
FTR's index of ATE, chipmakers, and PC makers vs. the Dow-30, rose slightly in January as investors seem to think that chip stocks may have bottomed.

All we know for certain about the near term outlook is billings must follow bookings and thus billings data will likely tumble when SEMI reports January results later this month. Bookings may improve as service contracts were renewed last month.

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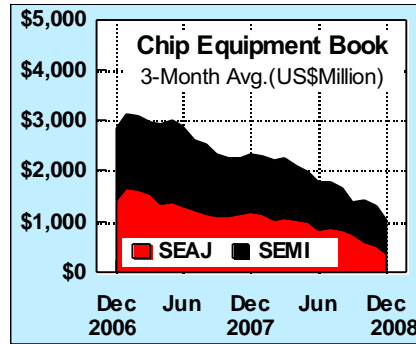
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Total chip equipment bookings and billings for the final quarter of 2008 were not much better than for TAP equipment. North American equipment suppliers reported \$668.7 million in bookings (three-month average basis) for December, down 14.7 percent MoM and down 42 percent YoY. In Japan three-month average total chip equipment bookings were \$353.6 million, down 32.9 percent MoM and down 74.2 percent YoY.

While the 'official' final numbers were not available when this was written, all indications are that 2008 worldwide chip sales will have declined 4.4 percent from 2007 to \$262 billion, according to several analysts, including Gartner. Even the SIA's latest forecast released last month projects 2008 chip sales at \$261.2 billion, down 2.2 percent YoY, the first such decline since 2001. It expects chip sales in the fourth quarter, historically a strong quarter for the industry, to decline by 5.9 percent from the prior quarter. Then the SIA projects that 2009 sales will decline another 5.6 percent to \$246.7 billion before resuming growth in 2010 of 7.4 percent to \$264.9 billion and by 7.5 percent in 2011 to \$284.7 billion.

Last month brought us a tidal wave of financial reports confirming just how bad the TAP equipment business really is. In this issue we provide detailed descriptions of the Q4'08 revenue results from Advantest (down 51 percent YoY), Teradyne (down 25.2 percent YoY, despite the addition of revenues from Nextest and Eagle Test), and FormFactor (down 66.9 percent YoY).



In addition:

- K&S reported revenues (from continuing operations) of \$37.4 million, down 70 percent YoY and a loss from continuing operation of \$22.2 million, or \$0.37/share.

- ESI reported that its revenues were \$25.6 million, a 66.9 percent YoY decrease and a loss of \$29.3 million or \$1.08/share.

However, if you thought 2008 was a rotten year for the semiconductor capital equipment sector, wait until you see what 2009 brings – at least according to the speakers at SEMI's annual *Industry Strategy Symposium* (ISS) last month.

- Credit Suisse's Satya Kumar said he now expects 2009 chip CAPEX spending to be down 44 percent YoY, worse than his previous forecast of down 28 percent. He sees no meaningful spending recovery until 2011. He said, "The industry faces the combined effects of reduced consumer spending in developed markets, lower demand for DRAM, delayed ramp of new NAND products, structural compression in logic and lower foundry capital intensity."

- Barclay's Capital's C.J. Muse said he expects capital spending could be down 50 percent this year, driving all the companies in the industry to lose money. "Investors don't want to miss the bottom, but we think it is too early," he said. He noted that "while the sector has rallied nicely off its November lows, and there is some possibility of further near-term gains, but the valuations on 2009 estimates are still expensive. "We are hard pressed to call for strong recovery off the bottom and expect shares to be range-bound."

- Stifel Nicolaus analyst Patrick Ho sees CAPEX down 35 percent this year, after an estimated 37 percent drop in 2008. His old forecast was for a 28 percent down year. His new forecast puts 2009 spending at \$23.7 billion, below the depressed 2002 level of \$27.3 billion, which was down 37 percent from 2001. He said "push-outs and project delays will depress CAPEX across the board."

- Tim Arcuri, of Citigroup Investment Research expects IC revenues will be down 20 percent YoY in 2009, as IC units also fall 20 percent. He expects the first wave of fab-tool orders will come from memory makers, and added, "We will finally see M&A activity in the semiconductor equipment space late this year."

- Jim Covello of Goldman Sachs, is forecasting chip sales to be down 10-15 percent in 2009, with CAPEX down 50 percent. Orders for chip equipment will bottom in Q1 of 2009, with flattish growth in Q2, but no full order recovery (for equipment) until 2010, he said. He also believes the first wave of fab-tool orders will come from memory makers as better ASPs result from supply cuts in that sector.

- Brett Hodess of Merrill Lynch, sees IC revenues down 22 percent YoY this year and IC units: down 13 percent. He expects CAPEX to be down 33 to 40 percent. However, he believes that the first wave of fab-tool orders will come from logic makers, namely Intel.

- Jim Feldhan, president of Semico Research has a slightly different view. He said in 2009 the IC industry will fall 5.9 percent, he said. On the other hand, the industry could see select "shortages" this year. Going forward, there is expected to be a "mild recovery" in 2010, when Semico projects that the IC industry will grow 7 percent

Klaus Rinnen, managing VP at Gartner sees "A slow turnaround for the semiconductor industry possibly beginning in 3Q09, but doesn't see a sustainable recovery until 3Q and 4Q of 2010."

"There are no good signs for 2009 in any end-market sector," Rinnen said. Equipment makers will see some early turnaround in 4Q09, Rinnen believes - but a sustainable recovery won't begin until 3Q and 4Q of 2010. By then a new cycle of memory investment should start and foundry capacity utilization will rise again, triggering equipment buys. By 2011, he expects all sectors to be up again.

Rinnen then asked, "as chip revenues have slowed from 17 percent annual growth in the '90s to perhaps 8 percent now, how much capital intensity do we need? With 17 percent growth, chipmakers were spending \$0.22-\$0.24 for every \$1 of revenue, so now at the 8 percent growth rate there has been over-spending.

He pointed out that memory spending of \$0.45/\$1 of revenue is unsustainable, Rinnen also pegged logic at about \$0.17/\$1 and foundry at \$0.18/\$1. He expects this capital intensity to decline going forward. In addition he expects R&D spending by equipment makers to drop \$8B-\$12B over the next four years - just when more R&D will be needed."

His advice to chipmakers is that they should focus on technology rather than just on capacity and also evaluate if Moore's Law still makes sense. He also pointed out that the chipmakers that are the technology leaders are also profit leaders.

In addition, he suggested that "The industry must increase the rate of consolidation, he said, and it must seek radical improvement in manufacturing efficiency."

His advice to equipment suppliers is to prepare for survival in a slower-growth era, in which they will have fewer customers but those customers will have deeper pockets.

He also suggested that vendors should diversify into allied markets, and maximize R&D efficiency through alliances and collaboration. He suggested that tool makers should consider licensing technology in some cases rather than creating it.

## IN FTR'S OPINION

### *"It's not just the economy, stupid!"*

The above is obviously a paraphrase of the slogan widely used during Bill Clinton's successful 1992



presidential campaign. While much of the short-term problem of the semiconductor equipment business is obviously the result of the worldwide recession - it is not the only cause. There are longer-term changes occurring in the industry that will out last the present economic problems.

For the moment at least, anyone following the semiconductor industry understands the road to any positive growth in 2009 and beyond is through the consumer. "Restoring consumer confidence is key to growing semiconductor sales going forward," according to George Scalise, president of the Semiconductor Industry Association. More than half of all chips manufactured now go into consumer electronics such as the Apple iPod, digital cameras, PCs and the like. There will be little or no growth in worldwide chip sales until the consumer resumes past buying habits of electronics.

That isn't going to happen any time soon as consumers can not get the credit that they have historically used to fund their spending habits. Large amounts of home equity have disappeared along with stock portfolios, all of which were used to fund past purchases of everything digital. Consumers are also cutting back as they're worried about losing their jobs.

As we wait for consumer confidence to return, there is an opportunity for the chipmaking tool industry to adopt to the changes that have take place since the downturn in 2001. As Teradyne CEO, Mike Bradley, said in his analyst call last month when discussing his company' - including firing some 530 employees - "these changes are permanent."

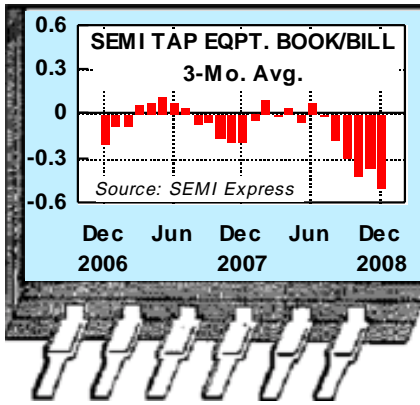
There can be no question but that the massive cuts in employment made by every major TAP equipment maker (with the exception of Advantest, which it admits it is considering it) over the past few months are indeed 'permanent'. In this writer's opinion there is no chance that employment in this industry will ever return to even its 2007 levels.

The demand for 'lower-cost test', is finally being met with more BIST, more multi-site testing, and software systems such as those from Optimal Test (p.11). That company claims its products will allow chipmakers to eliminate half of its testers from its test floor. If that rather strong claim is correct remains to be seen, but tools such as they are offering will result in many fewer testers/device tested. There is no doubt of that.

The unprecedented consolidation we saw in the TAP industry last year is likely far from complete and with every merger/acquisition the number of people employed in this industry is reduced. Certainly there is no better example than the LTX-Credence 'merger' where the surviving company now employs about half the people the two companies employed before the merger. The acquisition of Nextest and Eagle Test by Teradyne has had a similar, although not as great, effect on TAP industry employment.

This writer continues to believe that similar consolidation is on the horizon for the handler, wafer prober and tooling sectors - such as probe cards and sockets. So, with the exception of the outsourced manufacturing portion, within a few years the TAP equipment industry will likely employ fewer people than it does even now.

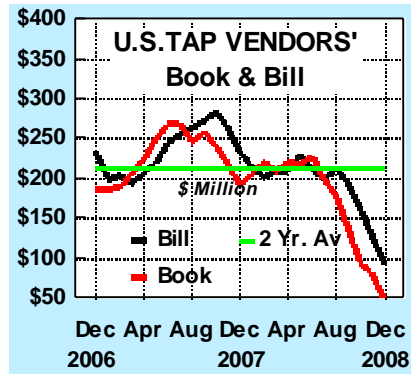
But, that's just my opinion.



**Dec. TAP B/B at 0.51**

SEMI said No. American chip equipment suppliers reported \$668.7 million in bookings (3-month average) in December, down 14.7 percent from November bookings of \$783.8 million and down 42.2 percent YoY. Billings were \$722.6 million down 10.4 percent from November billings of \$806.8 million and down 46.9 percent YoY. The book-to-bill was 0.93.

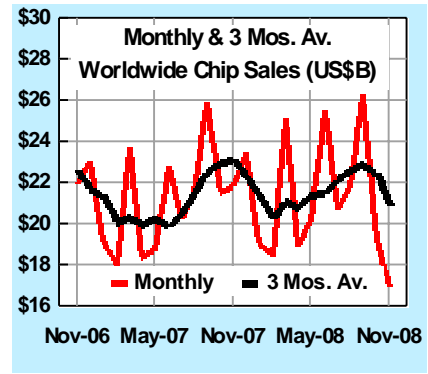
Front-end equipment bookings were \$621.4 million in December, down 11.5 percent from the \$702.3 million reported for November and down 35.6 percent YoY. Billings were \$629.8 million, down 7.1 percent from \$678.1 million in November and down 45 percent YoY. The resulting Front-end equipment book-to-bill ratio was 0.99.



Test, Assembly and Packaging (TAP) equipment bookings were \$47.3 million in December down 42 percent from the \$81.5 million reported in November and down 75 percent from the \$191.1 million in December 2007. December billings were \$92.8 million, down 27.9 percent from November billings of \$128.7 million and down 60.1 percent from \$232.9 million in December 2007. The TAP equipment book-to-bill in December was 0.51.

Note: The Dec. 2008 TAP bookings of \$43.7 million was the lowest since SEMI began its reports in Nov. 1991.

TAP Book-to-Bill Ratio			
	Nov'08	Dec'08	Dec'07
Book	\$81.5	\$47.3	191.1
Bill	\$128.7	\$92.8	232.9
B/B	0.63	0.51	0.82



**Nov. '08 Actual Chip Sales Dn. 22.5% YoY**

The WSTS reported that 'actual' (not 3-mo. avg.) chip sales tumbled 12.1 percent sequentially and 22.5 percent YoY in November 2008 - the most disappointing results seen since the 'tech-wreck' of 2001/02. The 22.5 percent decline posted in November was the largest decline since February 2002 and the 21.8 percent decline in unit volume were the largest since December 2001.

About the only 'bright' spot was (ray of light) was that LED lamp revenue increased 21 percent YoY in November while all other product groups posted substantial YoY revenue declines. And, even that rate of growth was down from the mid-20 to 40 percent growth that sector had seen in previous months,

Total IC revenues YTD through November were down 1.1 percent YoY. However, excluding memory products, revenue for the remaining product types was up 5.1 percent YoY. The real question is what happened in Q4'08? As this is written, for the first two months, October and November, total IC revenue was down 19 percent YoY and even excluding memory the rest of the product sectors were down 14.4 percent.

**November 2008 WW Chip Sales**

The SIA reported that chip sales declined in November to \$20.8 billion (3-month avg.), down 7.2 percent sequentially and down 9.8 percent YoY from November 2007 sales of \$23.1 billion. Excluding memory the YoY decline was 4.8 percent to \$17.3 billion from \$18.2 billion. Sales for the first 11 months of 2008 were \$232.7 billion, an increase of 0.2 percent from the first 11 months of 2007 when sales were \$232.2 billion. Excluding memory products, year-to-date industry sales increased 5.6 percent. "The worldwide economic crisis is having an impact on demand for semiconductors, but to a lesser degree than some other major industry sectors," said SIA president **George Scalise**

Market	(US\$Billion)			YoY	
	Oct'08	Nov'08	%Chg	Nov'07	%Chg
Americas	3.21	3.08	-4.0%	3.83	-19.5%
Europe	3.42	3.17	-7.3%	3.68	-13.9%
Japan	4.24	4.06	-4.0%	4.39	-7.3%
Asia Pacific	11.60	10.53	-9.3%	11.23	-6.2%
<b>Total</b>	<b>22.47</b>	<b>20.84</b>	<b>-7.2%</b>	<b>23.12</b>	<b>-9.9%</b>

Geographical Revenue Change		
Nov.'08	YoY	YTD
Americas	-23.9 percent	-8.4%
Europe	-28.6%	-3.3%
Japan	-13.7%	+1.4%
RoA	-23.4%	+3.8%
<b>Totals</b>	<b>-22.5%</b>	<b>+0.2%</b>

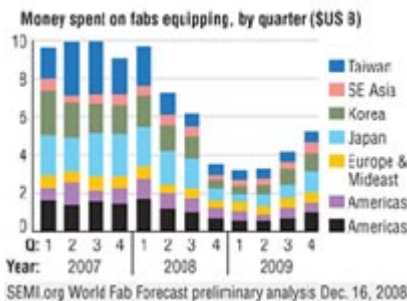
## ATE STOCKS

Ticker	Close	Change	52 Week	
	01/30	Month	High	Low
AEHR	\$1.46	-28.8%	\$11.20	\$1.43
ATRM	\$1.57	-19.5%	\$5.00	\$0.80
ATE	\$13.48	-17.5%	\$29.84	\$10.64
CSCD	\$3.09	58.5%	\$8.71	\$1.81
COHU	\$9.98	-17.9%	\$20.52	\$9.13
EGLS	\$0.15	4.8%	\$2.06	\$0.12
ESIO	\$6.32	-6.9%	\$18.14	\$5.05
FORM	\$15.56	6.6%	\$26.64	\$11.36
INTT	\$0.26	5.2%	\$2.39	\$0.10
KLIC	\$1.53	-10.0%	\$7.95	\$1.11
LTXC	\$0.29	7.4%	\$3.72	\$0.09
TER	\$4.81	14.0%	\$14.50	\$2.80
VRGY	\$8.31	-13.6%	\$26.11	\$7.35
<b>Avg. Change</b>		<b>-1.4%</b>		

## SEMI's World Fab Forecast

SEMI's *World Fab Forecast* tracks money spent on front-end chip fabs that are being equipped, including R&D and pilot fabs, fab construction projects, and capacity investments per fab. Unlike the *SEMI Worldwide Semiconductor Equipment Market Report*, data, the *World Fab Forecast* and its related *Fab Database* reports track any equipment used to ramp the fab, upgrade, expand, or change its wafer size regardless if it is new used, or transferred equipment.

The latest edition of the *World Fab Forecast* (Dec. 16, 2008) indicates that spending on equipping of front-end semiconductor fabs was expected to be about \$26 billion in 2008, down 31 percent YoY. It predicts 2009 equipment spending could decline by 30 to 40 percent, to the \$16B range - to the lowest spending level in the past 10 years.



In 2008, Japan spent the most on fab equipment at \$6.0B. This number is expected to drop by over 50 percent to less than \$3.0B in 2009. Korea, was the second largest equipment market in 2008, though that market is expected to decline about 40 percent to \$2.7B in 2009. The Americas and Japan are the only areas expected to show positive YoY growth rates in construction spending for 2009. Japan is expected to spend twice as much as the Americas, mainly driven by Toshiba, the Flash/Alliance JV, and Panasonic. Worldwide, Toshiba and the Toshiba/Sandisk Alliance.

In the Americas, AMD has announced the construction of its \$4.0B fab in upstate New York. This will be the only new high-volume fab project beginning construction in the Americas over the past three years. The last new high volume fab in the Americas was Samsung's 300-mm fab in Austin, TX, which began construction in 2006.

## FINANCIAL REPORTS

### Aehr Test Systems

FQ2 Ending Nov. 30 : \$000		
	2008	2007
Sales	\$9,242	\$9,675
Ops. Pft.	1,185	1,592
Net	872	1,366
Per shr.	0.10	0.16

### FormFactor, Inc.

FQ4 Ending Dec. 29 : \$000		
	2008	2007
Sales	\$39,889	\$120,505
Ops. Pft.	(46,675)	22,135
Net	(29,960)	14,351
Per shr.	(0.61)	0.29
FYr. Ending Dec. 29: \$000		
	2008	2007
Sales	\$210,189	\$462,191
Ops. Pft.	(138,011)	93,204
Net	(80,621)	72,890
Per shr.	(1.65)	1.47

### Electro Scientific Industries

FQ3 Ending Dec 29 : \$000		
	2008	2007
Sales	\$25,618	\$77,286
Ops. Pft.	(30,091)	8,198
Net	(29,258)	6,662
Per shr.	1.08	0.24

### Kulicke & Soffa Industries

FQ Ending Dec 29 : \$000		
	2008	2007
Sales	\$37,416	\$123,532
Ops. Pft.	(18,243)	7,033
Net	(22,164)	8,295
Per shr.	(0.30)	0.12

### LogicVision, Inc.

FQ4 Ending Dec 29 : \$000		
	2008	2007
Sales	\$2,996	\$2,874
Ops. Pft.	(788)	(772)
Net	(782)	(712)
Per shr.	(0.08)	(0.07)
FYr. Ending Dec 29 : \$000		
	2008	2007
Sales	\$12,173	\$11,618
Ops. Pft.	(3,629)	(4,109)
Net	(3,544)	(3,723)
Per shr.	(0.37)	(0.39)

### Teradyne, Inc.

FQ4 Ending Dec. 31 : \$000		
	2008	2007
Sales	\$194,767	\$260,416
Ops. Pft.	(49,906)	6,869
Net	(55,310)	16,704
Per shr.	(0.33)	0.10
Orders	\$169,404	\$281,995
FYr. Ending Dec. 31: \$000		
	2008	2007
Sales	\$1,107,042	\$1,102,280
Ops. Pft.	(51,066)	41,285
Net	(64,553)	\$77,711
Per shr.	(0.38)	0.39
Orders	\$996,471	\$1,107,855

## Analysts and Pundits at ISS

At the Industry Strategy Symposium (ISS) Wall Street analysts, Industry pundits and equipment company executives gathered to provide their outlook for the IC and fab-tool sectors in 2009. Notably, the lowest number of attenders in years (~115) were there to listen to them - perhaps because many others thought that photos of them out playing golf on the resorts' seaside course may have not played well with their employees and investors in light of their lousy financial performance, followed by big layoffs late last year with more expected this year.

In any case, three days of speakers attempted to tell them when the global economy - and the electronics industry - recover? Some said late 2009, others believe 2010 or 2011 and a few pessimists claimed it could take until 2013.

Nariman Behravesh, VP and chief economist at Global Insights opened the conference saying that the current downturn is likely to be the longest in the past six decades, with the largest peak-to-trough drop in real gross domestic product (GDP). "The steep back-to-back declines in Q4 and Q1 growth are likely to be near records, and the huge November and December payroll losses portray an economy in free-fall," Behravesh said. He added that "and policy responses appear likely in Europe and Japan, which could prolong the slump, while China has announced a big stimulus package that could add two percentage points to growth in 2009, he said.

His outlook for semiconductors, is that in 2009, the IC market will be "horrific" and will go into negative numbers, but he added "This downturn will be worse than 2001.

Randy Bane, VP and chief economist at Applied Materials said: "We are in a deep and protected global slowdown. There is no doubt there will be broad consolidation and restructuring" in the industry.

However, Bane sees an economic recovery sooner than later. "The recovery will happen in late '09 or 2010," he said. For the semiconductor industry, the first half of 2009 is expected to be weak, with some recovery in the second half."

Bob Johnson, a semiconductor manufacturing analyst at Gartner contradicted arguments that the chip industry has become an inherently profit-free sector. During the relatively strong 2003-2006 period, total industry net income was \$132.7B on \$902.5B in revenues, with logic IDMs making \$63.5B in net profits, of which Intel accounted for \$26.9B. Memory manufacturers had \$15.2B in net profits, analog/mixed-signal vendors \$12.3B, fabless IC companies \$21.3B, and foundry and semiconductor assembly and test services (SATS) companies \$20.4B. Good profits are possible, he concluded.

However, he noted the industry had net losses last year and will again this year, followed by several years of likely low (<4 percent) profitability.

Dan Hutcheson, CEO of VLSI Research claimed that "far-reaching changes are taking place among foundries and the fabless IC companies. In recent years, fabless-foundry model has lost its ability to remain at the leading edge of process technology."

Hutcheson argued that foundries have struggled in recent years as their capital costs have increased. The sub-prime mortgage crisis and the drying up of capital markets, he said, have also complicated things for the foundries and other capital-intensive parts of the industry.

He added, "Companies such as Texas Instruments that have made a decision "to get off the technology treadmill and go fabless will come to regret their decisions to rely more heavily on foundries, given the foundries' problems in staying at the leading edge. While, some view TI's decision as the beginning of the trend to go fabless; I believe that it's the end. The most powerful companies shift last, not first," he said.

Hutcheson also argued that the IDMs are making a comeback "because capital spending draws market share. If you spend at a 10-20 percent sustaining rate, you keep your market share. Spend more and it grows. In the 1990s foundries out spent IDMs and the IDMs lost. The reverse is taking place now."

The most upbeat voice at ISS was Bill McClean, president, IC Insights. "Every recession in the last 30 years has been followed by a boom in semiconductors, every time." McClean ticked off a litany of factors suggesting a strong rebound ahead in spite of the current malaise. First, he cited the huge and growing fiscal stimulus: \$850B in the US, \$586B in China, \$267B in the Eurozone plus \$458B in the UK, \$111B in Japan, and \$8B in India. China is giving subsidies for people to buy cell phones and plasma TVs. "There's even a stimulus package in Jamaica," he added. In addition there are record low interest rates; low oil prices and pent-up for automobiles and electronic products.. He agreed that it is still tough to get loans, but data show that credit markets are unfreezing.

As a result, he sees at least double-digit growth for chips in 2010, followed by a boom in 2011. But, until then, he sees semiconductor revenues down 17 percent in 2009, with the second half of the year being 50 percent stronger than the first half, and a big fourth quarter for electronic products. "Unfortunately," McClean said, "while downturns tend to start in the first quarter, this one kicked in during the fourth quarter of 2008, the worst time of the year for the electronics industry. The big issue in this downturn is pricing, not capacity.

Natural selection doesn't work in semiconductors. Hynix should be gone. ProMOS and Powerchip should be gone. Sixty cents for a 1Gb DRAM - Samsung is selling them for the cost of the package!" McClean said. He noted, though, "before chiding South Korea or Taiwan, we should remember that the US government is backing GM and Chrysler."

## Q4'08 and F'08 TAP Cos. Financial Rpts.

The latest financial reports from Teradyne and FormFactor clearly delineate just how the rapidly the TAP equipment market fell apart in the second half of last year.

### Teradyne

Reported that its fourth quarter revenues declined to \$194.77 million from \$260.42 million in same quarter last year. Its loss for the quarter was \$55.31 million or \$0.33 /share, compared to net of \$16.70 million or \$0.10/share in the same quarter of last year. On a non-GAAP basis, the company's loss from continuing operations in the fourth quarter was \$32.5 million, or \$0.19/share, compared to net of \$17.0 million or \$0.10/share in the year ago quarter.

Semi-test product revenues in the fourth quarter were at \$95 million and semi-test service was \$51 million, including about \$15.5 million for FLASH testers and service. The above include Eagle Test results from the acquisition date of November 14.

For the full year 2008, Teradyne's sales were \$1.1 billion almost flat YoY. Its loss for the year from continuing operations was \$65.3 million, compared to a net of \$17,771 million last year.

Bookings in the first quarter were \$169 million compared with \$282.0 million in the year ago quarter. Booking for the full year 2008 were \$996.5 million compared with \$1,107 million in 2007. Its guidance for present (March) quarter is for sales of \$125 million to \$145 million, with a loss/share between \$0.38 and \$0.31 on a non-GAAP basis.

Teradyne also announced that in the first quarter of this year that it would reduce its worldwide staff by 14 percent (about 530 employees) and start a 10 percent broad-based temporary pay cut. It said that these and other cost reductions, will reduce its expenses by approximately \$140 million annually. It said that it believed "about \$0.80 of every dollar its taking is a permanent reduction."

Mike Bradley, the company's CEO commented that "While our revenue and earnings were just about the low end of our guidance we actually had only about \$3 million of cancellations as customers who had orders in backlog mostly took delivery on schedule throughout the quarter. But, the new order pipeline dropped sharply. Total orders dropped about 14 percent sequentially, but new system orders were down significantly, especially, in semi-test, which declined more than 60 percent QoQ. It was hard to find many bright spots in these numbers, but our Mil Aero and Automotive business unit did have good quarterly bookings in both systems and service. You can see that we are guiding revenues down by about 35 percent, in the first quarter in response to this widespread cutback in the customer demand. We think this is pretty close to base level of revenues as it is built upon our ongoing service business and a more steady business in automotive and defense system's test and on a small new technology components in all the businesses."

Bradley added: "In the short-term, we're going to be in a tough environment. We're in a semiconductor test market that's running at a size last seen in the early nineties, with equipment utilization rates at the 50 to 70 percent range. And, where there is a very little optimism voiced by customers, regardless of region, our market segment. So, my basic message is brutal market conditions near-term. In the short-term, we're expecting virtually no capacity buying. We do expect any demand will be tied to new technology so our new products in especially in the Asia region."

He noted that in December quarter, overall utilization of its testers was in the in the 70-80 percent at its IDM customers, but only in the high 50 percent range at the OSATs.

He also said that the company had installed an early version of its UltraFLEX high-speed memory test system at its "lead customer" (reportedly Samsung) and "it's performing well in its early check."

### FormFactor

Said its revenues for the quarter ended December 27, 2008 were \$39.9 million, down 24.1 percent sequentially from \$52.6 million in Q3 2008, and down 66.9 percent from \$120.5 million in the same quarter of 2007. Its loss for the quarter was \$30.0 million or \$0.61/share. For the full year 2008 it reported revenues of \$210.2 million, down 54.5 percent from \$462.2 million in fiscal 2007. Its loss for the full year 2008 was \$80.6 million or \$1.65/share, compared to net of \$72.9 million or \$1.47/share for fiscal 2007. Its loss for fiscal 2008 includes \$9.2 million in pre-tax restructuring charges, \$4.4 million in pre-tax non-cash asset impairment charges as well as a \$4.1 million pre-tax charge for bad debt reserve

Fourth quarter revenue for DRAM was \$29.2 million, down 17 percent sequentially and a decline of 67 percent versus the same quarter a year ago. FLASH revenues for the fourth quarter were 2.2 million, down 74 percent from the third quarter and 89 percent versus the fourth quarter a year ago. Logic revenue was \$6.5 million, down 14 percent sequentially and down 37 percent YoY. Revenue in all geographies declined year-over-year with Japan being the only region up sequentially, the company said. It also took a \$3.9 million receivable write down, and said that its present exposure to customers who are experiencing liquidity issues is \$15 million.

"The global economic slowdown has significantly reduced demand for semiconductor devices in general, and for memory devices in particular," said Mario Ruscev, CEO of FormFactor. "Our fourth quarter results reflect a sharp decline in demand due to the economic climate following a major crisis due to supply. The retrenchments we have seen by our customers is unprecedented in both its speed and depth. In the near term, there is uncertainty on the financial stability of some of memory customers which has resulted in exceptionally low visibility for FormFactor."



LTX-Credence unveiled two new FX digital options for its X-Series test platform — the FX2 and FX-HS sub-systems. "Both options were designed to enhance the ability of the X-Series platform to provide cost-optimized test solutions for the full range of consumer and mobility devices," it said.

#### The FX2

Offers double the pin count per slot of the standard FX1 digital sub-system, while providing FX1 compatibility. It also offers improved scan chaining for multi-site testing, high voltage pin electronic capability for embedded FLASH testing, full-featured synchronization, and independent timing domains to support multiple periods running simultaneously. Additional capabilities include differential drive and compare, memory test per pin, 200 MHz IO data rates, scan chains with up to 3 G memory depth, keep alive, 64 M vector memory, and real time capture with a 16M data capture memory.

#### The FX-HS

Provides high speed digital pattern rates up to 800 Mbps. In addition to providing many of the standard FX digital option features, it enables RF-Dig protocol detect and capture using symbol matching, new high frequency modes in the pattern sequencers, and enhanced DSP send and receive capability. Pin functions include 800 Mbps data rates, differential operation, scan chains with up to 3G memory depth and keep alive functions, all programmable on the fly, and 64 M vector memory, and 16 M capture memory.

## Aehr's New Burn-in & Test System

Aehr Test Systems has announced two orders for its new Advanced Burn-in and Test System (ABTS). One was from Integrated Service Technology (iST) in Taiwan and the second from a customer described only as "from a leading European provider of imbedded wireless technology." Both systems were reported as "configured for burning-in and testing advanced logic devices."

Aehr describes the ABTS system as "the first in a series of new products that will be introduced over the next several quarters for testing packaged devices. Future members of the ABTS family will focus on high-power logic and memory devices." It said, the ABTS technology was based on its *FOX-1* full-wafer contact burn-in and test system, the ABTS family of products is based on a completely new hardware and software architecture designed to address both today's devices, and also future devices."

The ABTS can be configured to provide individual device temperature control for devices up to 50W or more and with up to 320 I/O channels. "It uses N+1 redundancy technology for many key components in the system to provide the highest possible system uptime," it said.



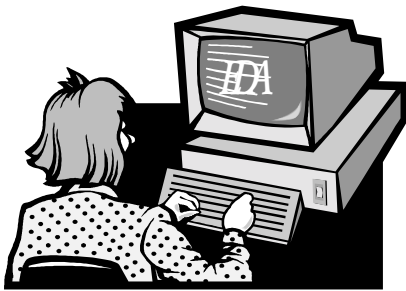
## SUSS MicroTec's ProberBench OS

SUSS MicroTec Test Systems introduced its *ProberBench Operating Environment* at SEMICON Japan. It's a software suite for what it describes as "efficient, intuitive and safe wafer-level probing." SUSS claims that in 1995 it had revolutionized wafer-level test by introducing the first *Windows*-based prober control software. Now, it says that it has developed "the latest software revolution for engineering wafer probe systems for the 21st century."

It said that the ProberBench Operating Environment is a complete re-design of its software interface and architecture resulted from an intensive, three-month user study. It said this study showed that users were unhappy with the current solutions in the market due to feature overload and confusing interfaces. Many said they were experiencing high rates of probe card and wafer damage linked directly to the user misinterpretation of signals and software feedback.

The new software includes the *Control Center*, placing all navigation and control elements at the users fingertips and providing instant feedback about wafer and probe positions for safe wafer navigation and probing. Also included is the new *SPECTRUM Vision System*, which is the main vision application and supports up to four live video feeds like *ContactView* - a horizontal view of the probe tips and an upward-looking camera for viewing the tips of fine-pitch, vertical probe cards.

In addition ProberBench has several optional automation tools such as a tool for automatically aligning the wafer and generating a wafer map. Combining this feature with its *MicroTec* Automated Thermal Management and *ReAlign* Technology enables unattended test routines over multiple temperatures to be run overnight and on weekends, significantly increasing system utilization and ultimately improving time to market and ROI.



## EDA Q3 Revenues Fell 10.9% YoY

The EDA Consortium Market Statistics Service said that the electronic design automation industry revenue fell 10.9 percent to about \$1.3 billion in the third quarter, from about \$1.4 billion a year ago.

"Surprisingly high YoY growth in the services segment and a small increase in PCB design tools and semiconductor IP were offset by declines in CAE and IC physical design & verification, resulting in an overall decline for Q3 2008," said Walden C. Rhines, EDAC chair and Mentor Graphics CEO/chairman.

"While the double-digit drop affected all regions except rest-of-world, which showed only 1 percent decline, all regions except North America had a positive four-quarter moving average," Rhines added.

By product sector:

- EDA's largest category, computer aided engineering, generated revenue of \$465.4 million, representing a 17.6 percent decrease over the same period in 2007.

- IC physical design & verification, revenue decreased to \$298.7 million, a 22.3 percent YoY decrease compared to a year ago.

- Printed circuit board and multi-chip module revenue increased 2.5 percent YoY to \$130.9 million rate for PCB & MCM showed a 0.4 percent increase.

- Semiconductor IP revenue totaled \$267.8 million, a 1.8 percent increase over the same quarter a year earlier.

- Services revenue was \$104.8 million, up 25 percent from the same period a year ago.

## EDAC: Grim present – Green future

Top executives from some of EDA's biggest companies, gathered in San Jose, CA in mid-January for a panel discussion and generally delivered the message that the EDA business will be mired in difficult conditions for the foreseeable future. Nevertheless, most voiced optimism that EDA and intellectual property would help to power an eventual economic recovery as governments enact stimulus packages and the world pushes for greener technologies.

Aart de Geus, chairman/CEO of Synopsys said proposed and enacted government stimulus packages throughout the world total \$2.6 million. Emergency loan guarantees by governments amount to another \$2.7 trillion, he said. "I have very high hopes that we are part of the solution going forward." He said there is "no question" that much of the new administration's proposed \$800 billion stimulus would go to high-tech – including a new 'smart grid' for distributing electricity in the U.S. more efficiently."

Most other panelists also expressed hope that the momentum behind so-called green technologies would be a major driver for electronics and, by extension, EDA. Rajeev Madhavan, chairman and CEO of Magma Design Automation talked of looking under the hood of an electric car and seeing "10 times the electronics of a regular car." He also said electronics would play a vital role in decreasing U.S. gasoline consumption and reducing the more than \$700 billion that the country spends annually on foreign oil.

Panelists also expressed agreement that – unlike 2001, when the industry downturn was largely self-inflicted through overcapacity and poor inventory management – electronics is this time at the mercy of larger economic forces.

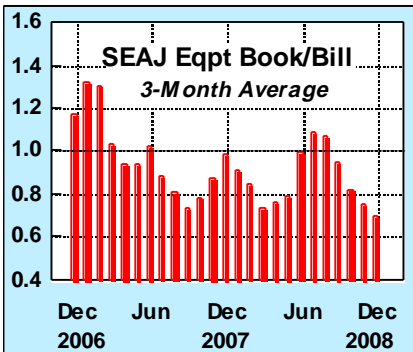
Chris Rowen, CTO of Tensilica, only partly in jest, noted that: "This downturn is not about the electronics industry. We are really a flea on a sick dog at this point."

Walden Rhines, chairman and CEO of Mentor Graphics predicted that the final numbers would show that EDA revenue declined by 12 percent in 2008, and likely EDA revenue would decline another 6 percent in 2009. However, Rhines noted that much of the decline could be attributed to a change in the revenue recognition model of Cadence Design Systems. Cadence, which last year lost its status as the leader in EDA revenue to Synopsys, is in the process of transitioning to a more ratable model, an accounting term for recognizing revenue over the life of a contract rather than at the time of booking. The change of business model means lower near-term revenue. He said "the 'intrinsic decline' for 2008 – which he defined as the actual difference in product and services revenue YoY – would be about 1 percent. And, if not for the ongoing impact of the change in Cadence's revenue recognition model, EDA would achieve nominal growth of 1 percent in 2009, Rhines predicted. Still, Rhines said, 2008 would be the third year when EDA revenue declined, joining 1999 and 2003. It would be the first time that the decline could not be entirely attributed to a change in the revenue recognition model of a major vendor, he said.

EDAC panelists said they expected the downturn to result in consolidation for EDA, though not immediately. Madhavan, said, "Consolidation tends to occur when the industry begins to emerge from a downturn."

### EDA STOCKS

COMPANY	Ticker	Close	Change	52 Week	
		01/30	Month	High	Low
Cadence	CDNS	\$3.78	3.3%	\$11.73	\$2.42
LogicVision	LGVN	\$1.20	57.7%	\$2.02	\$0.24
Mentor	MENT	\$4.66	-9.9%	\$16.00	\$3.40
Synopsys	SNPS	\$18.50	-0.1%	\$26.61	\$13.94
Avg. Change		12.8%			



## Japan Dec. Chip Eqpt Book Down 74% YoY

The SEAJ said Japan-based chip equipment makers posted ¥34,047 million (US\$353.60 million) in orders in December 2008 (three-month average basis) down 32.9 percent from the November 2008 level of ¥50,762 million and down 74.2 percent from the ¥132,215 million in orders posted in December 2007. The three-month average of worldwide billings in December 2008 was ¥48,960 million (US\$508.48) down 27.4 percent from the final November 2008 level of ¥67,392 million and 63.5 percent down the December 2007 billings level of ¥134,206 million.

The SEAJ book-to-bill ratio for December was 0.70.

### JAPANESE ATE STOCKS

INDEX	Ticker	Close 01/31	Change Month
NIKKEI 225	N225	13,592	-11.2%
Advantest	6857	2,335	-26.6%
JEM	6855	1,016	-7.2%
MJC	6871	3,900	3.2%
TEL	8035	6,360	-7.3%
TSK	7729	2,135	-21.9%
Yokogawa	6841	1,029	-16.2%
Average Change in January			-12.7%

## Advantest Posts 4<sup>th</sup> Straight Qtrly Loss

Advantest posted its fourth consecutive quarterly loss for its fiscal Q3, ended Dec. 31, 2008. Its orders plummeted 51.3 percent sequentially and 71.7 percent YoY in the quarter, to just 8.9 billion yen (US\$92.4 million), the lowest since at least 2003 when Advantest began reporting quarterly results. "There are no bright spots. Orders from memory makers are especially bad, and orders from logic chip makers are also starting to fall," Executive Officer Hiroshi Nakamura said in announcing the quarterly results.

Its sales for the quarter fell 44.0 percent and 58.3 percent from the previous year to 14.6 billion yens (US\$156.1 million). Its loss for the quarter was 7.8 billion yen (US\$80.6 million), compared to 3 billion yen (US\$25.5 million) profit a year earlier.

Sales of memory testers tumbled by 89 percent YoY to just 2.1 billion yen (US\$21.8 million) from 19.1 billion yen (US\$168.7 million) - and accounted for just 14.4 percent of its sales for the quarter. Non-memory tester sales were actually up slightly to 5.4 billion yen (US\$56.1 million) from 5.2 billion yen (US\$45.9 billion) in last years quarter, accounting for 37 percent of its sales for the quarter.

Handler and interface sales in the quarter were 2.3 billion yen, down 67.6 percent YoY, representing about 15.8 percent of its sales, while service/sales rose 22 percent YoY to yen 5.0 billion (US\$51.9 million) and accounted for about 34.3 percent of its sales for the quarter.

Advantest has stopped disclosing a forecast for the full business year, ending March 31, 2009. However it is expected to post an operating loss of 17.3 billion yen (about US\$195 million) for the year according to a median forecast of 18 analysts polled by Reuters Estimates.

It also said it would revise its planned year-end dividend of 25 yen/share, but has yet to decide how much it will now pay out.

Advantest commented in its report for the quarter that: "The operating environment in the third quarter has shown signs of rapid economic downturn due to the bankruptcy of major U.S. financial institutions and other effects of a financial crisis worsening day by day, and the simultaneous rise in the value of the yen. In the test systems market semiconductor makers recorded reduced revenues as a result of the substantial decline in consumption of end consumer products that utilize semiconductors and thus they have moved to minimizing capital expenditures."

It added: "Moreover the trend towards restructuring and mergers and acquisitions by and between semiconductor makers has accelerated, resulting in their adopting a cautious attitude toward investments due to the prospect of a surplus of production facilities. Demand for memory test systems continued to be weak as a result of significantly reduced demand for DRAM and FLASH memory and the continued decline of memory prices. The environment in the non-memory market continued difficult as a result of weak automobile production and makers of LCD driver ICs continuing to restrain their capital expenditures." It also noted "demand for its T2000 tester products, including test modules for next-generation MPUs, dropped steeply."

### Advantest Corporation

FQ3 Ending Dec. 31: (\$000).

	2008	2007
Sales	\$151,600	\$309,200
Ops. Pft.	(120,500)	8,800
Net	(80,600)	26,500
Orders	\$92,400	\$275,600

*Editor's note:*

*The Final Test report - in an effort to make Advantest's financial results, expressed in U.S. dollars, consistent over various time periods - uses the average yen/dollar conversion rate over the period covered by the report. In this report we used 1US\$=96.3 yen.*



**By Dan Glotter, CEO and Co-founder, OptimalTest – exclusive to FTR.**

Whether you believe the current downturn will extend through 2009 or through the next two quarters, there is little debate that the semiconductor industry - and test in particular - will emerge changed. The industry's highly distributed manufacturing and production model is a reality and still evolving, and the outcome of what seems to be a global economic transformation cannot be predicted. What seems assured, however, is a massive change to the global economic and business landscape. Whether you are a fabless design house, a globally distributed integrated device manufacturer, a foundry or a "fab-lite" player, operational efficiency will be required to emerge a stronger, leaner player.

Bringing enhanced visibility and operational transparency across today's distributed manufacturing Advanced adaptive testing technology together with an integrated IT infrastructure across geographies and partners deliver near-time and off-line capabilities for monitoring product and test fleet performance across multiple sites as well as real-time control and monitoring on the local test floor. Such modern software helps companies gather and organize data from across its dispersed operations and subcontractors in near time. Once data is gathered and organized, technologies combined into an "early detection" engine.



**Dan Glotter**

This engine will process the data and automatically scan for all kinds of issues affecting yield, quality, test time and other critical dashboard measurements. Exceptions can be automatically flagged, with alerts and reports generated almost immediately for quick corrective action.

On a regional level, data logs can be transferred to all local operations, achieving near-time early notifications about quality, yield loss, test time control and data integrity checks. Off line, data logs can be transferred from regional operations to headquarters.

Once data is captured in a test-oriented database, all kinds of sophisticated analyses of test time, yield, and statistical processing controls can be done off line to implement solutions across a worldwide operation. On the local test floor, real-time efficiencies that round out global operational management can be realized through other, complementary solutions that perform same-time control and monitoring. These achieve additional benefits in test time reduction, outlier detection, prober controls and other local-site issues.

In fact, the enormous returns on timely management of global test operations lie in the fact that its scope of test operation optimization and management is leveraged - amplified — across an entire enterprise, resulting in a multiplier effect. In addition, it is a win-win for everyone: product, ATE and yield engineers; operations; and managers. It allows for supply chain management in near time, and better corporate management of business units and divisions.

For foundries working with OSATs, OSATs working with other OSATs, IDMs working with their business units or partners, and fabless working with all other members of the semiconductor model — OSATs, foundries and IDMs — a state-of-the-art global test management solution can ensure data with high integrity that is immediately actionable to deliver rapid, cutting-edge advantage in the marketplace.

## SW Test 2009

The 19th Annual IEEE Semiconductor Wafer Test Workshop has announced its Call for Papers. It will be held at the Paradise Point Resort in San Diego, CA from June 7-10, 2009. The Abstract Submission Deadline: is Feb. 27, 2009 and the Final Paper Submission Deadline is May 15, 2009.

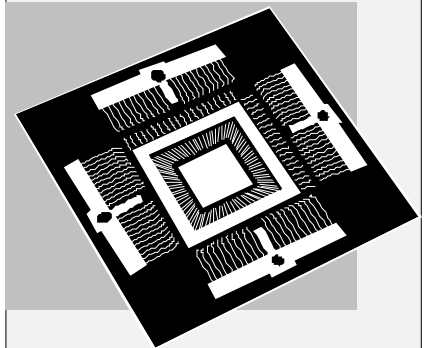
The Workshop will begin on Sunday afternoon June 7 with a topical tutorial, followed by a welcome reception, dinner, and a Keynote Speaker. The Technical Program will start Monday morning with 30-minute presentations in theme-oriented sessions.

The SW Test EXPO 2009 will showcase many of the key suppliers to the wafer probe industry and, as always, there will be ample opportunities for networking.

Registration includes all meals, refreshments, social activities, and technical program and exhibit attendance, as well as the printed proceedings distributed at the Workshop.

Details regarding abstract submission and all previous electronic versions of past Proceedings can be found at <http://www.swtest.org>.

### ATE/DFT MEETINGS



**March 8-11, 2009**

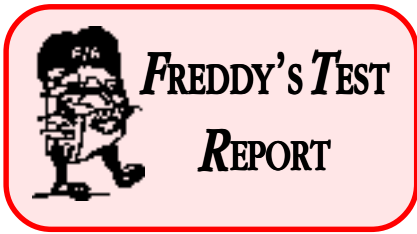
**THE 2009 BITS WORKSHOP**  
Hilton Phoenix East/Mesa  
Mesa, Arizona.

[bitsinfo@bitsworkshop.org](mailto:bitsinfo@bitsworkshop.org)

**June 7-10, 2009**

**SW Test Workshop**  
Paradise Point Resort,  
San Diego, CA

[www.swtest.org](http://www.swtest.org)



**INDUSTRY**

**SEMI and the SEAJ** said chip equipment sales in November 2008 plunged 54.6% YoY to \$1,231.7 million, down for the ninth straight month. YoY sales dived 52% in Japan, 74% in South Korea, 85% in Taiwan 60% in China 8% in North America and 38% in Europe.

**SEMI** said that back-end equipment booths at SEMICON/West this year – which originally occupied all three floors of the West Hall of Moscone Center in San Francisco, and was cut to just two floors last year, will occupy only the first floor this year as Solar takes over the other two floors.

**DRAMeXchange** said the slowdown in technology node migrations at the major DRAM producers is adding to the expected CAPEX cuts this year as companies struggle to combat increasing losses and preserve cash.

**iSuppli** said global sales of DRAMs are expected to fall 4% YoY in 2009, after falling 19.8% in 2008 – their third straight year of decline.

**COMPANIES**

**Verigy** said its lawsuit against its ex-employee, **Romi Mayder** and his company **Silicon Test Systems** has been resolved “to the parties’ mutual satisfaction.” It said that as part of the confidential settlement, all intellectual property owned, developed Mayder or assigned to Silicon Test Systems, since June 1, 2006 has been transferred to Verigy. Apparently that would include Mayder’s recently granted patent on, “Tester on a Probecard.” (See *FTR*, Jan. ’09, p.9).

**Micro Control Company (MCC)** has announced that **ISE Labs** has ordered the HPB-5B burn-in with test system. The HPB-5B is a burn-in and test system that features active thermal control for high-power semiconductor devices rated up to 150W.

**The Oerlikon Group** (Pfäffikon, Switzerland) will sell its packaging equipment **Esec** unit to Dutch company **BE Semiconductor Industries NV** (Besi, Duiven, Netherlands) .

**Zygo’s** board has recommended that the company withdraw from the proposed takeover bid by **Electro Scientific Industries (ESI)**. In October, ESI moved to acquire Zygo for \$173.5 million in stock. ESI responded that it “does not agree with Zygo’s conclusion, and is evaluating its alternatives under the merger agreement.”

**PEOPLE**

**Tom Newman** retired from **Teradyne** on January 30, after 36 years at that company. For the last 13 he had been its VP for Investor Relations. He is being replaced in that position by **Andy Blanchard**, an 18 year veteran at Teradyne. He has held sales management positions at Teradyne and spent six years in Tokyo running its Japanese field operations.

**Paul Sakamoto** has been named president/CEO of Montreal Canada-based-**DFT Microsystems**. He replaces **David Lisk** who will remain director. Sakamoto had been the CEO of **Inovys** until its acquisition by **Verigy** last year and had previously had worked at **Credence Systems, MCT, Megatest** and **Intel**.

**Steve Harris** has joined **Cascade Microtech** as VP Engineering after having spent nearly five years as VP of R&D and engineering at **ESI**.

**Joe Bronson** was named CEO of **SVTC Technologies**. He most recently was CEO of **Sanmina-SCI** and earlier was co-CEO of **FormFactor** and CFO at **Applied Materials**.

**Craig Barrett, Intel's** said its chairman, will retire at the company’s annual stockholders’ meeting in May. Board member **Jane Shaw** will become non-executive chairman,

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