

By Walt Custer & Jonathan Custer-Topai

Second Quarter Slowdown, Escalating Costs, Rising Inventories Show Management Challenges Continue

After a strong first quarter “electronic equipment food chain” demand began slowing in April. A combination of normal seasonality, excess inventories, over exuberant 1Q’06 ordering, lower end-market demand and increasing government efforts to thwart inflation via higher interest rates worked together to cause lower global orders for electronic equipment and components.

The April indicators were down substantially from March. N. American & Taiwan/China PCBs, global semiconductors and U.S. electronic equipment all experienced lower demand.

In the first quarter we saw some initial worrisome signs as inventories grew relative to sales throughout the supply chain (Chart 1). The increases were not large but they were most significant for component makers, distributors and EMS providers.

In late May the U.S. Department of Commerce revised its historical orders, shipments and inventories data. Per Chart 2 about \$25 billion (12%) annually of U.S. electronic equipment shipments were “revised out” of the DOC Factory Orders data. Computers & related products showed the biggest decline—presumably to better account for “domestic” production which is now outsourced to Asia.

At the same time that the historical DOC data was revised downwards, April orders showed a noticeable decline from March’s 5-year high (Chart 3). However April ’06 was still a strong month for electronic equipment orders (highest April since 2001).

April semiconductor shipments reflected the April slowdown (correcting for lower assembly activity and excess inventories). The 1-month shipments (Chart 4) reveal the magnitude of the drop (which was not evident in the 3-month average data typically quoted by the SIA).

In addition to reduced 2Q’06 demand, sharply higher costs (energy, metals, laminate, petroleum-based chemicals, etc) are forcing PCB makers to try to raise prices to preserve already small margins. Chart 5 shows the skyrocketing copper costs. Tin, silver and gold have had similarly large increases.

The global PCB industry is facing real challenges: overcapacity and sharply escalating costs in the face of expected slower economic growth. Our “normal business landscape” of yearly, seasonal fluctuations overlaid on 3-5 year business cycles creates a few grey hairs for many of us!

General Business Conditions

Strong 1Q’06 sales of mobile phones, primarily in emerging markets, led Gartner to raise its full-year 2006 estimate to 960 million units, up 18% versus 2005. Global mobile phone sales totaled 224 million units in 1Q’06, up 24% from 1Q’05, due to steady growth in Europe and North America and a surge in China and India sales.

Japan produced 6.196 million sq. meters of PCBs with revenue of 225 billion yen in 1Q’06.

	Q’05	1Q’06	%Gain
Revenue (yen)	192.2 billion	225 billion	+ 17.1%
Volume (sq m)	6.15 million	6.196 million	+ .6%

Japanese PCB manufacturers are shifting toward higher priced products to help maintain good margins.

World semiconductor sales were \$19.6 billion in April, up 8.1% vs. April 2005. April’06 declined 0.4% vs. March’06. “More intense competition led to a sequential decline of 6.1% in sales of microprocessors, offsetting modest growth in the rest of the microchip market,” said SIA President George Scalise. The PC market remains strong, with unit sales of personal computers running 13-15% ahead of last year. DRAM sales grew by 3.7% sequentially and by 7.7 percent over April of 2005, evidence that the end market remains strong,” Scalise said.

N. America’s Semiconductor Equipment Industry posted an April 2006 book-to-bill ratio of 1.11. “The book-to-bill continues into its fifth consecutive month of growth, and third over parity,” said Stanley

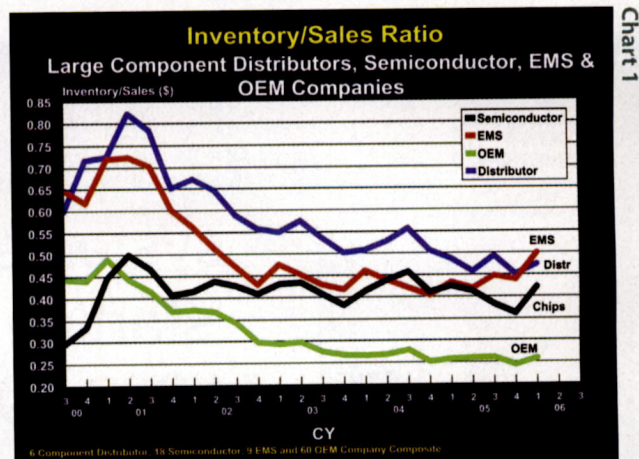


Chart 1

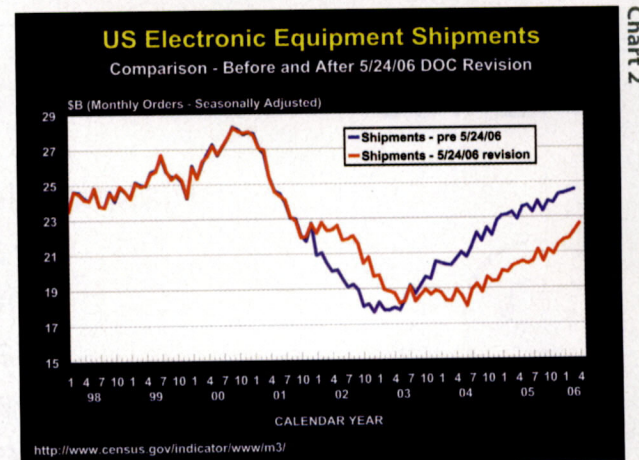
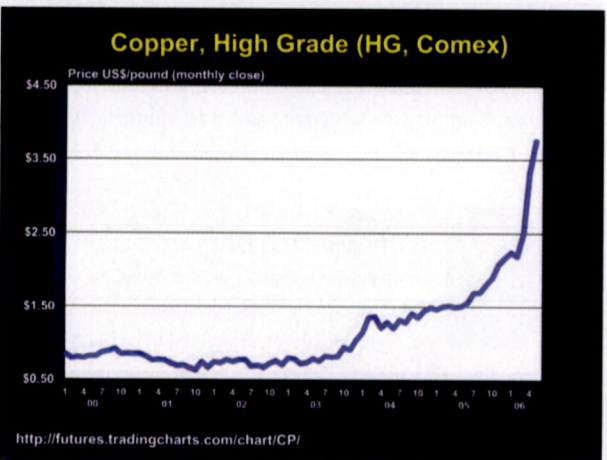
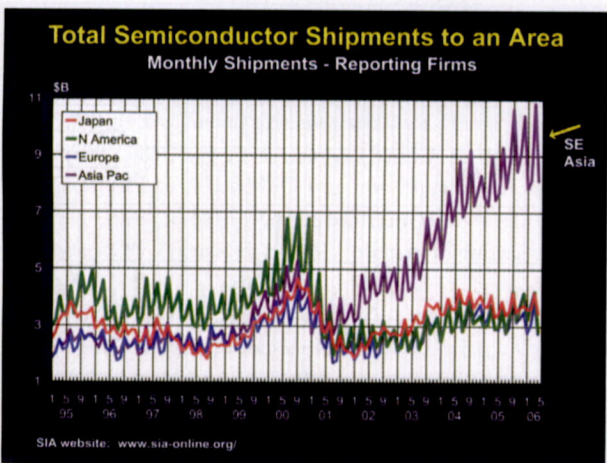
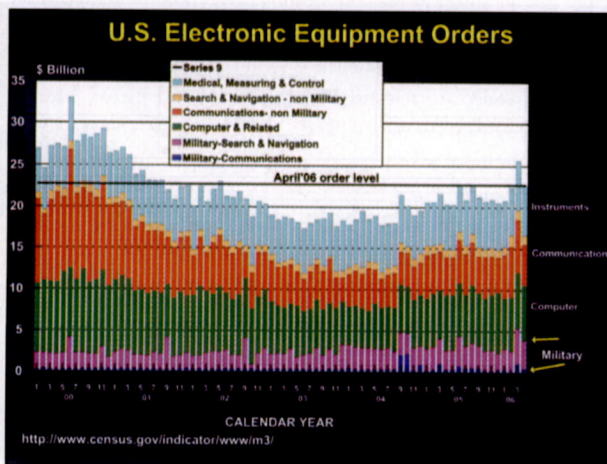


Chart 2

Myers, president and CEO of SEMI. "This continued trend points to increasing confidence in the market and a healthy year over year billings growth in 2006."

World semiconductor equipment billings for 1Q'06 were \$9.58 billion, up 3% year-over-year. "Bookings and billings for the first quarter of 2006 posted strong gains over the fourth quarter of 2005, with N America and Korea showing particularly robust growth," said SEMI's Stanley Myers. "Year-over-year sales in most regions saw double-digit growth, with the exception of Europe, and Korea,



which saw capacity purchased in 2004 coming online."

PCB Fabrication

3M developed a "shrink film printed circuit" by printing a circuit trace onto polymer shrink film.

Aspocomp will invest several million euros in new machinery at its Salo, Finland PCB plant. It will also build an HDI PCB plant in Chennai, India with a total investment in 2006 and 2007 of EUR 75 million.

AT&S is expanding capacity by building a second manufacturing plant in Shanghai with an investment of \$200 million for the first phase.

CIPSA Circuits, Spain will set up a state-of-the-art manufacturing unit at Doddaballapur, India with an investment of Rs12 crore. CIPSA is expecting sales of \$5 million in its first full year of operations and \$20 million within four years.

Coretec appointed Andre Kern CFO.

DDi named its financial chief Sally Goff to "Principal Accounting Officer." DDi was also featured on The History Channel's "Modern Marvels" on May 10, 2006.

Denali Partners (who most recently acquired two plants from Tyco Electronics) will lay off 362 of the 400 employees in the PCB factory in Madrid, Spain.

Electropac closed one of its Canadian facilities due to the much stronger Canadian currency against the U.S. Dollar.

Elektrotryck, Sweden's largest PCB maker, spent 100 000 to upgrade its four MicroCraft Emmas with new probes and software to increase stability and shorten the process time by up to 90%.

Elmatica A/S bought PCB design firm Nordic Printdesign.

Elprint AS invested 0.4 million in a Developing-Etch-Strip system from Höllmüller Maschinenbau.

Endicott Interconnect Technologies appointed Doug Gotelli Western Region Director of Sales. EIT won new contracts for wire bondable PBGA substrates from Singulated Technology and CORWIL Technology Corporation.

Firan Technology Group completed US DoD Quality Certification, MIL-PRF-31032.

Fuba added a drilling press to its Dresden Germany facility enabling it to produce up to 8-layer PCBs.

GSPK Circuits is the first PCB manufacturer to be awarded the RoHS trusted service Kitemark by the BSI.

Ibiden will build a 30,000 sq m factory in Beijing, China to produce PCBs for mobile phones and it will also build a factory in the Philippines to produce integrated circuit (IC) packages for personal computers.

Merix exercised its option to acquire an additional \$10 million of its 4% convertible senior subordinated notes due 2013.

The company also received the "2006 Printed Circuit Commodity Supplier of the Year Award" from Rockwell Collins. Finally, it sold \$60 million of 4% convertible senior subordinated notes. Proceeds will be used to retire the \$25 million principal amount of 6.5% convertible debentures.

Minco bought the latest horizontal electroless PTH and copper plating technology from HMS Höllmüller.

Multi-Chem is using a SGD16 million loan to purchase new mechanical and laser drilling machines.

M-Wave achieved a minimum closing share price of at least \$1 and will remain on the NASDAQ.

Ryowa opened its \$7.1 million plant in Chino, Nagano prefecture, central Japan. Monthly PCB capacity has increased to 16,000 sq. m. from 12,000 sq. m.

Sierra Proto Express (Sunnyvale, CA) is investing "millions of dollars" in its new Micro Electronics Technology Center. It expects to be able to produce 10-micron lines and spacing with 75-micron holes in the next six months.

TC Interconnect will list its shares on the Hong Kong Stock Exchange.

Tyco Electronics Printed Circuit Group installed multiple additional Paragon™-6000 LDI systems in its U.S. PCB manufacturing facilities.

Wus Printed Circuit will invest \$15.6 million for an opto-electronics PCB facility in Ningbo, Zhejiang Province, China.

Materials & Process Equipment

ADI American Distributors established a new AS9100-certified EMS Division in Randolph, NJ.

Asahi Kasei will spend a few billion yen to boost dry film photoresist capacity to 180 million sq. meters in China.

Atotech won the small corporate division of the Mayor's International Community Awards in Charlotte, North Carolina. Atotech was nominated by United Way of York County.

Catalyst Manufacturing Services purchased a 2nd Pillarhouse Jade S200 Selective Solder machine for fine pitch and RoHS compliant soldering.

Cookson Electronics Assembly Materials released Alpha OM-338 PT a solder paste that offers pin testability while allowing high print speeds.

DuPont filed a patent infringement lawsuit against MacDermid and MacDermid Printing Solutions, L.L.C. over patents relating to Cyrel FAST technology.

Elite Material will invest up to \$20 million in an unnamed Chinese FCCL company.

Isola's laminate plant in Lanarkshire, UK had a fire that took 40 firefighters two hours to bring under control. This plant had been previously shut down and the fire will not impact Isola's supply ability. Isola's Perstorp, Sweden plant (formerly Polyclad) will close October 31st, 2006. Finally, the Polyclad Laminates' factory in Franklin, New Hampshire closed on June 23, 2006.

Laird Technologies' thermally conductive T-preg HTD is available for automotive and motor control applications.

Lead-frame prices reportedly rose 10% in June. Higher metal costs were key.

Micro Tech, Japan developed a high-resolution screen-printing technology that can generate 10 micron line/space.

Mitsui Mining & Smelting developed a smoother electrolytic foil for LCD COFs. It has completed its 20,000 sq. meters/mo. facility at its Ageo factory (Saitama Prefecture), Japan.

Nanya Plastics announced that will raise its laminate prices by 15%.

Orbotech received an \$18 million order for AOI equipment from an undisclosed PCB maker in the Pacific region.

Thermalworks and Lewcote Corp. formed Carbon Core Laminates to specifically manufacture STABLCOR. Thermalworks licensed North Texas Circuit Board to make PCBs with STABLCOR products.

Valor Computerized Systems appointed Chuck Feingold and Micha Bornstein as Directors. It also exercised rights to purchase the Danish TraceXpert Operations for \$10 Million.

Electronic Manufacturing Services & Related Assembly Activity

Bookham will phase out its Paignton, UK assembly manufacturing operations as part of its company wide cost reduction plan. It is also continuing staff reductions at its South Devon factory.

Delphi laid off 400 at its plant in Szombathely, Hungary and plans on relocating some production to Slovakia to reduce labor costs. Delphi is also seeking right to void labor contracts in the U.S. bankruptcy courts.

Elcoteq expanded capacity in Manaus, Brazil and Juarez, Mexico plants to 5,000 square meters and 13,745 square meters. Both facilities will support manufacturing and supply chain services for communications products

Foxconn will expand motherboard distribution in India by setting up a local office by year end. The company is laying off 300 in Hungary to cut costs and increase efficiency.

Hon Hai became Taiwan's top manufacturer with total sales of NT\$911.77 billion in 2005. Hon Hai Precision is investing US\$123.8 million in factories in Beijing, Shenzhen and Zhongshan.

Hana Microelectronics will add 10,000 square meters to its plant in the northern province of Lumpun in Thailand.

Incap laid off 130 people in Vuokatti, Finland.

Integrated Microelectronics, Philippines signed an agreement with Germany-based BuS Elektronik in hopes of sourcing more business from Europe. In December 2005, IMI merged with Singapore-based EMS company Speedy-Tech Electronics. Its manufacturing facilities in Jiaxing and Shenzhen, China; Laguna, Cavite and Cebu, Philippines; and Singapore serve more than 100 OEMs. It is also working on a strategic alliance with an unnamed Japanese EMS provider.

Kimball Electronics acquired Magna Donnelly's PCB assembly operation in Longford, Ireland.

LaBarge was awarded a \$4.5 million contract from BAE Systems to manufacture ruggedized PCB assemblies for military applications.

Labtech launched a microwave MIC assembly service.

Raven Industries Electronic Systems division in Sioux Falls received the IPC RoHS lead free electronics assembly process capability certification.

SMTC is now RoHS compliant and has achieved Class 3 lead free validation.

Solectron's new FinePitch East plant in Wilmington, Mass. will focus on new product introduction and low-volume, high-mix manufacturing services. ■



Walt Custer's column is sponsored by Rohm and Haas Electronic Materials. Custer Consulting Group provides market research, business analysis and forecasts for PCB fabrication & assembly, passive components, semiconductors and the electronic equipment end markets. You can reach Walt by phone at 707-785-1777, e-mail at walt@custerconsulting.com or visit his web site: www.custerconsulting.com.