# Little real growth during this year's "busy season"

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and Jon Custer-Topai

Using regional purchasing managers' indices as a leading indicator, all major geographical areas were still in recessionary territory in mid-summer (*Chart 1*). Only China and the USA were showing improvement, but they still had "no growth" PMI values (<50).

Global electronic equipment sales growth dropped from +5% in 1Q'12/1Q'11 to almost zero in the second quarter (*Chart 2*), and disturbingly the ratio of inventories/sales rose noticeably for semiconductors (*Chart 3*). A seasonal chip inventory increase is "normal" in the first quarter of a year but for the stock swelling to continue into the second quarter indicates weak business conditions.

Large EMS companies also felt the second quarter slowdown (*Chart 4*). In fact much of the global electron supply chain experienced negative "growth" in 2Q'12 (*Chart 5*). Only the disk drive industry did well—achieving 32% Q2'12/Q2'11 revenue growth as production recovered from the Thai floods and pricing firmed as competitive activity moderated following large HDD company mergers.

Regionally, electronic equipment shipment growth was at or near zero (3/12=1.0) in mid-summer in the USA, Europe, SE Asia & Japan (*Chart 6*). Japan had a temporary 3/12 growth spurt earlier in 2012, but this rebound was just relative to the earthquake period of spring 2011. SE Asia (the largest electronic equipment producer by far) reported flat OEM sales in July 2012 as its end market equipment shipments were 4% below the same month in 2011 (*Chart 7*).

Based upon monthly semiconductor shipments to the four key regions (*Chart 8*), there appears to be no disasters. However this year's summer-fall "busy season" presently offers hope for only sequential (month-to-month) but not real (year-to-year) growth in 2012.

Custer Consulting Group's world printed circuit board model (*Chart 9*) also predicts no growth for PCBs this year, which is in line with the weak performance of electronic equipment makers, semiconductor producers and EMS companies.

Hopefully we are wrong with our somewhat pessimistic forecasts, and demand will strengthen later this year. There are a few positive signs (strong Taiwan wafer fab demand being one), but at present 2012 appears to be on track for being a "flat" year.

## End markets

### Computers & related devices

- Global tablet shipments expanded 67% y/y to 25 million units in 2Q'12 and Apple's global market share reached 68%.—Strategy Analytics
- Worldwide tablet shipments grew 66.2% y/y to 25 million units in 2Q'12.—IDC
- Western Europe PC market declined 2.4% to 13.6 million units in 2Q'12.—Gartner

### Mobile communications

- Worldwide mobile phone shipments grew 1% y/y to 406 million units in 2Q'12.—IDC
- China handset production increased 5.5% y/y to 535 million units in 1H'12; exports increased 85.4% y/y to 457 million units.—tech.sina.com

### Consumer electronics

- Global consumer electronics industry revenue is forecast to grow 5% y/y to nearly US $790 billion in 2012.—Strategy Analytics
- U.S. gaming hardware market revenue fell 32% y/y to $150.7 million in July 2012.—NPD
- Worldwide consumer technology market is projected to exceed $2.1 trillion in 2012.—Gartner

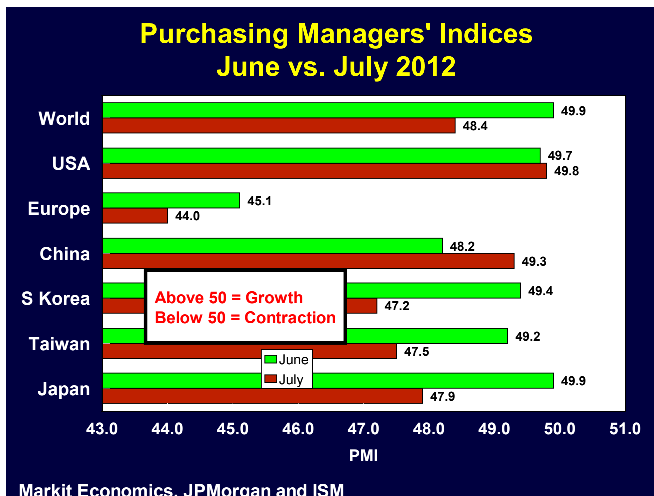


Chart 1.

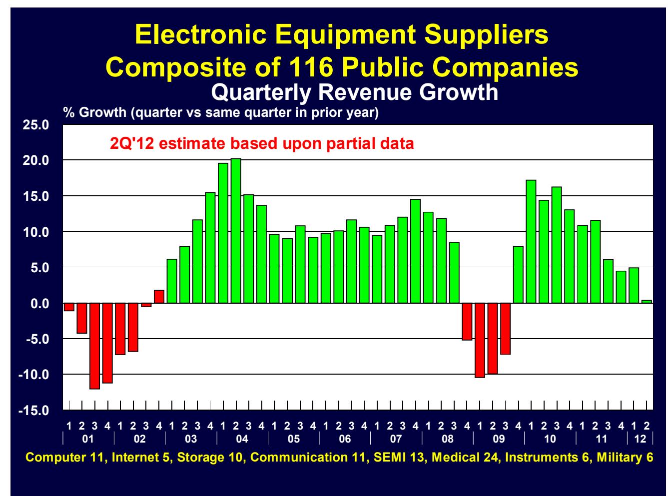


Chart 2.

### Other

- North American robotics sales increased 14% y/y in 2Q'12 to 5,556 robots valued at $403.1 million.—RIA
- China automotive electronics industry is expected to reach RMB320 billion in 2012.—RnRMarketResearch

## EMS, ODM & related assembly activity

China's electronics manufacturing industry sales grew 11.2% y/y to RMB 3.17 trillion (USD 498 billion) between January and May 2012.—MIIT

ACD acquired a PSA N2-GEN series pressure swing adsorption nitrogen generator.

American Computer Development acquired a 50,000 SF facility in Nashville, Tennessee.

Baltic Elektronik added three new SIPLACE SX1 machines in Grevesmühlen, Germany.

Celestica acquired D&H Manufacturing.

Curtis Instruments added a NPM-W platform from Panasonic Factory Solutions Company of America.

EE Technologies

- expanded its Reno, Nevada manufacturing plant to three shifts.
- added its 9th electronics production line in Mexico.

Eolane acquired Lagassé Communications & Industries.

Firstronic added an ERSA Versaflow 40/50 dual pot selective solder machine.

Flextronics began manufacturing sequenced inverters for ArrayPower.

Foxconn/ Hon Hai

- plans to open a factory in Indonesia by early 2013.
- shipped 16 million iPads in 1H'12 from its Chengdu factory.
- raised NT$8 billion from issuance of 3-year bonds at 1.18% yield.

Foxconn International named Executive Director Chih Yu Yang as its CEO.

IEC Electronics appointed Florence Hudson to its Board of Directors after Carl Sassano stepped down.

Jabil Circuit's CEO of its Aftermarket Services Group Hartmut Liebel was appointed to Power-One's Board of Directors.

Marl invested £250,000 to expand its design, prototyping, manufacturing and test facilities in Ulverston, England.

Sanmina-SCI's Monterrey, Mexico facility achieved ISO 13485 certification for medical devices.

SigmaTron leased a 112,109 SF building at El Potrero Vesta Park in Tijuana, Mexico.

Sonic Manufacturing Technologies achieved ISO-13485 certification.

Soumac opened a 8,100 SF facility in Portsmouth, Hampshire, UK.

Sparton and USSI's joint venture received a $25.4 million U.S. Navy sonobuoy contract.

TELKOM-TELMOR entered the EMS market.

Videoton's VEAS Kft has invested 4 billion HUF in past two years to expand LED capacity by 15%.

Winchester Electronics acquired Electrical Specialty Products.

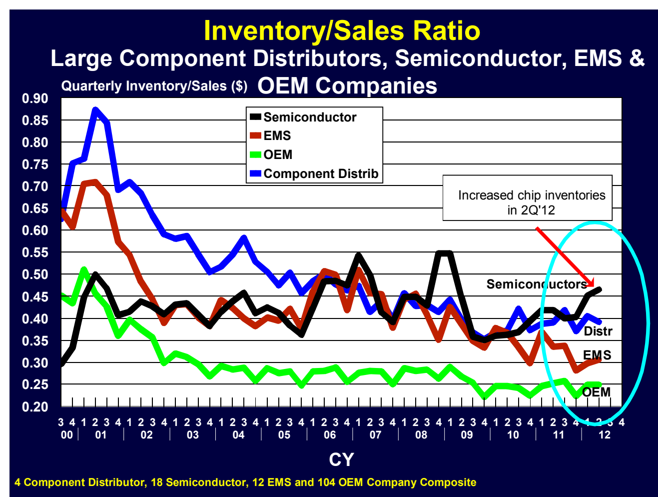


Chart 3.

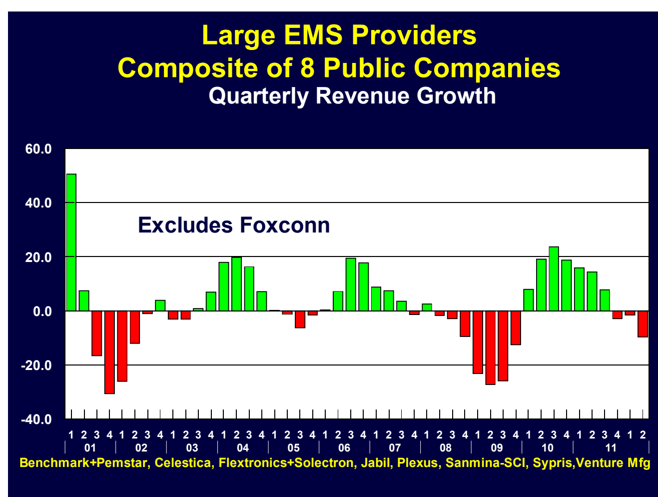


Chart 4.

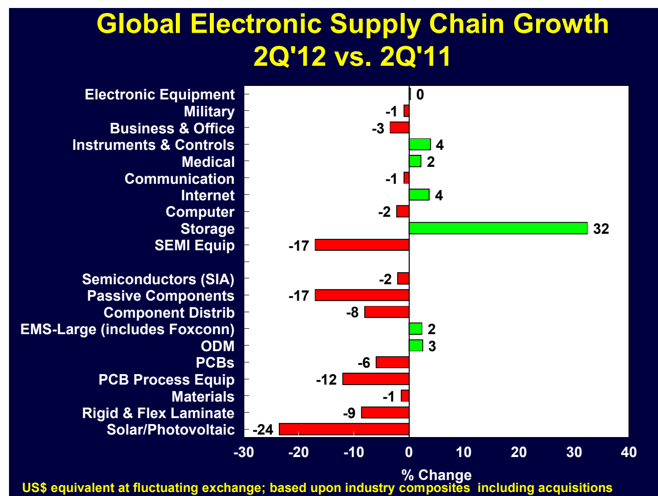


Chart 5.

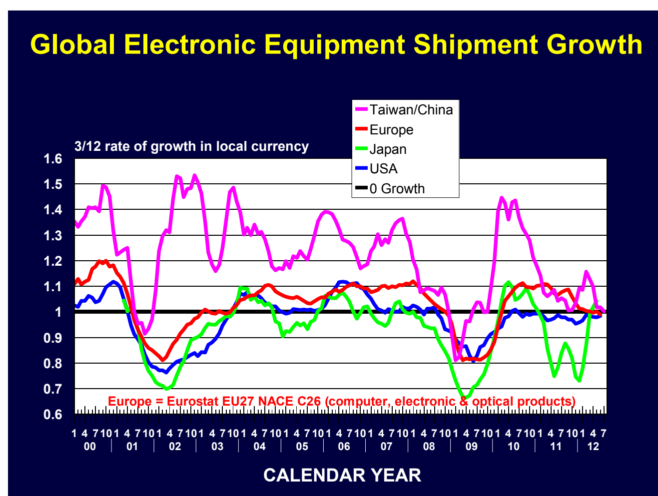


Chart 6.

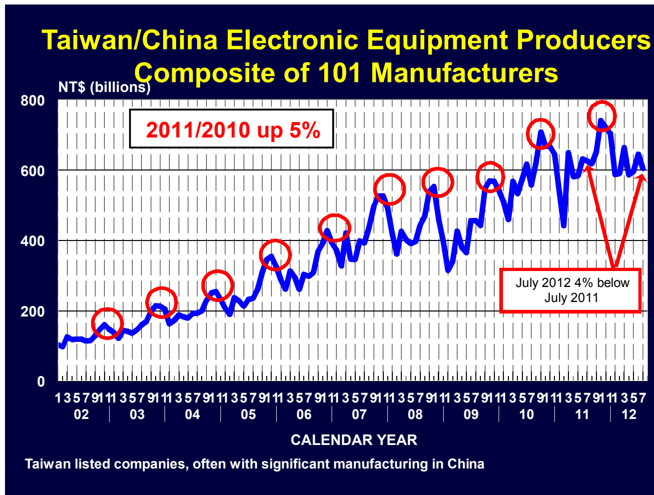


Chart 7.

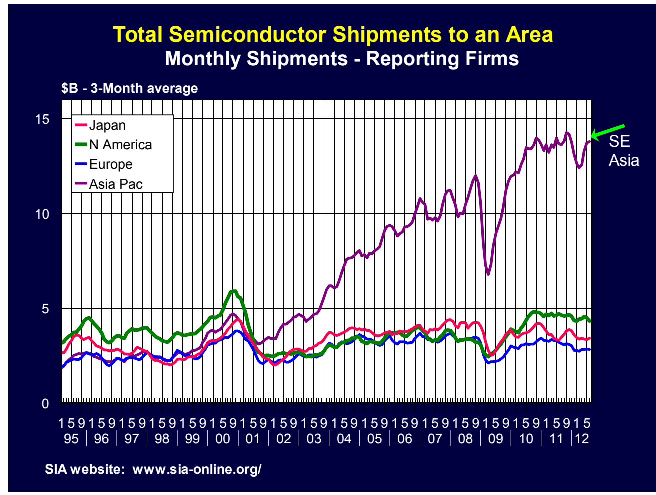


Chart 8.

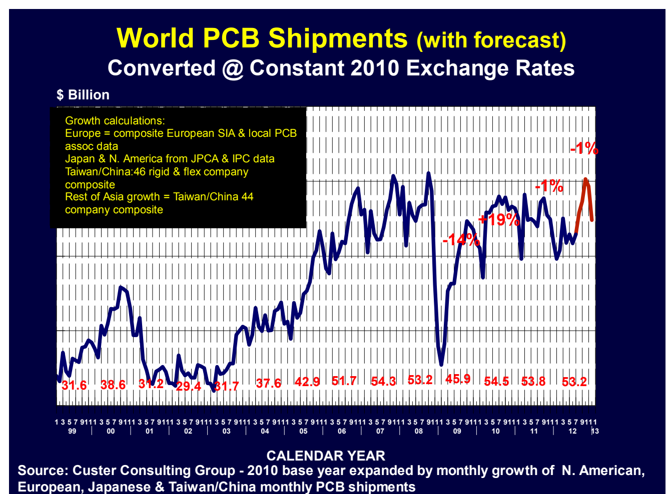


Chart 9.

## PCB fabrication

APCT purchased a digital imaging system from Maskless Lithography.

Bare Board Group was awarded #47 position on Tampa Bay Business Journal's 2012 FAST 50 list.

Basista Printed Circuit Boards completed its modernization and logistics upgrade project, which included repositioning, realigning and moving nearly every piece of machinery.

Cicor named Patric Schoch interim CFO.

DKN Research co-developed ultra-thin copper-free flexible circuits as small as 0.2 micron thick with micro via holes.

Fineline Global acquired a 25% stake in Shenzhen Fastprint Circuit Tech.

GSPK Circuits added two Burkle bonding presses and a cooling press.

Huawei invested in Perform AOI systems from Vi TECHNOLOGY.

KCE Electronics' three plants in Thailand have recovered to about 60-70% of pre-flood production levels.

Lightning Circuits and Tappenden & Co formed a metal circuit production and technology partnership named DK Thermal (Canada) Ltd.

Mass Design named David Farmer Sales and New Business Development Representative.

MEC consolidated marketing in China and added PCB chemical processing lines in Taiwan, Suzhou and Zhuha.

NCAB Group acquired P. D. Circuits.

PPC Electronic was declared bankrupt.

Q.P.I and ECSN began jointly selling PCBs in the Russian Federation and Ukraine.

Streamline Circuits added Frontline PCB Solutions' InSight PCB pre-CAM software.

Teknoflex completed AS9100 Rev C certification across its entire company.

TTM, Chippewa Falls purchased multiple ACURA fully automatic exposure units from ALTIX—Automatech.

Viasystems

- named Admiral William Owens and David Stevens to its Board of Directors.
- was certified to use Shocking Technologies' Xstatic voltage switchable dielectric material.

Würth Elektronik Group closed its Würth Elektronik FLATcomp Systems plant in Pforzheim, Germany.

## Materials & process equipment

Global SMT soldering equipment market is expected to grow from $411 million in 2011 to $634 million in 2017.—Frost & Sullivan

A-Laser named Josh Saunders as its president.

ASM Assembly System's SIPLACE opened its Americas' HQ in Suwannee, Georgia.

Blundell appointed Ash Technologies as its UK representative.

Conductive Compounds introduced a new series of specialty conductive inks designed for plastic molding applications.

Count On Tools installed a Zeiss CONTURA G2 coordinate measuring machine in Gainesville, Georgia.

Enthone appointed Rick Reagan as president and Rick Stuhler Business as Development Manager, Molded Interconnect Devices—Asia.

Mowden Controls added a third Essemtec FLX pick and place machine.

Henkel Electronic Materials developed an underfill system designed to reduce package stress through controlling die and substrate warpage.

Indium appointed AdoptSMT Swiss AG as its distributor in Switzerland.

Manncorp introduced its Valueflex line for full SMT assembly in limited production spaces.

Nihon Superior Center for Manufacture of Electronic Materials was established at University of Queensland.

Nippon Kayaku expanded its epoxy resin product line for semiconductor encapsulation and PCB applications.

Park Electrochemical

- appointed Steve Pittari VP Aerospace.
- ceased operations at its facility in Zhuhai, China.

Polyonics introduced its PolyFLEX family

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old for the system in a package (SiP) in current day jargon. By patching together individual pieces of silicon having separate functions into a single package, there is potential for significant reduction in time-to-market, which can translate into profits for those who are first to market. There is a price to pay, however, and that bill comes due in the form of known good die (or lack thereof) which exacts a penalty in lower assembly yield. Even so it remains an attractive alternative for product developers, and there have been married constructions proposed and executed for such product or glass. The SIP products were springboards for 3-D in the form of stacking of both chips within packages and packages on packages in board level assemblies, and today both solutions are being employed in products.

Circling back to the question posed earlier relative to the relevance of 2.5-D, it turns out that there are actually several practical reasons for using these so-called 2.5-D structures, mostly related to the materials and manufacturing technology used in their construction. One of the first benefits of using silicon as a substrate is that there is an established base of prospective manufacturers who can make the substrates using semiconductor manufacturing techniques. Semiconductor manufacturing technologies allow the producers to create circuit patterns and holes of extremely fine dimension on extremely dimensionally stable substrates, opening the doors to the possibility of attaching chips and flip chip fashion where the terminations are on much finer pitch than might be achieved using more traditional interposer substrates made from organic materials. There is as well a performance benefit that comes from allowing chips to be placed closer together which can not only increase performance but also reduce power/energy requirements. These two features have been near the top of every designer's "wish list"since the earliest days of electronics. Yet another key distinction and benefit of 2.5 D appears to be the technology's ability to match coefficient of thermal expansion with the silicon chips that are attached to its surface. This is critical when one is attempting to interconnect chips having minuscule solder interconnections to a next-level interposer. The fact that one might be able to do the processing while the interposers are still in wafer form is an advantage that is not lost on those tasked with making such assemblies.

*Thus 2.5-D at the end of the day is fundamentally an "interposer on interposer"*

In summary, 2.5-D technology appears to be at its roots a high-end interposer that is comprised of either silicon or glass in combination with redistribution circuitry and microvias or TSVs to create something that at the next level of assembly looks very much like a large flip chip but which is in fact a multichip structure that may or may not have stacked chips as an element of its construction, which, were it to have such, would actually satisfy the definition of a 3-D assembly.

*Verdant Electronics founder and president Joseph (Joe) Fjelstad has more than 40 years of international experience in electronic interconnection and packaging technology in a variety of capacities from chemist to process engineer and from international consultant to CEO. Mr. Fjelstad is also a well known author writing on the subject of electronic interconnection technologies. Prior to founding Verdant, Mr. Fjelstad co-founded SiliconPipe a leader in the development of high speed interconnection technologies. He was also formerly with Tessera Technologies, a global leader in chip-scale packaging, where he was appointed to the first corporate fellowship for his innovations. He has 150 US patents to his credit.*

## Little real growth during this year's "busy season"—Continued from page 16

of flexible substrates for printed electronics.

Siplace appointed Rostislav Kratochvil Eastern Europe Account Manager.

Teledyne

- appointed Ruth Bruch to its Board of Directors.
- acquired LeCroy.
- The Murray Percival Company
- added vapor phase soldering from IBL.
- appointed Kathleen (Katie) Reagan as its Personal Account Executive for Northern Ohio and Western Pennsylvania.

Ventec Europe added a precision CNC panel saw from Yow Shi to its Leamington, UK headquarters.

VJ Electronix opened a customer center in Shenzhen, China.

### Semiconductor, passive components and related equipment

Automotive IC market is expected to grow 8% to $19.6 billion in 2012.—IC Insights

Wireless IC market will grow 10% to $72.6 billion in 2012.—HIS

Industrial electronics semiconductor growth is projected to moderate to 7.7% in 2012.—IHS iSuppli

Mobile DRAM is set to expand 10% y/y to a record $6.56 billion in 2012 on growing smartphones and tablet sales.—IHS

Packaged LED revenue is forecast to grow from $11.4 billion in 2012 to $17 billion by 2018.—Yole Development

Semiconductor equipment sales are expected to grow from $42.4 billion in 2012 to $46.7 billion in 2013.—SEMI

Semiconductor wafer fab materials are forecasted to grow from $25 billion in 2012 to $26.3 billion in 2013.—SEMI

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