Difficult first quarter

Recovery in Q2 but unrest in Korea could impact electronic supply chain

Walt Custer
and Jon Custer-Topai

2013 was predicted to be a recovery year, but it has started out a bit weak. In 1Q'13 business conditions were negatively impacted by a combination of a normal post-Christmas seasonal downturn, tepid PC sales that were not helped by Windows 8's cool reception, Apple's retrenching with order cuts to its supply chain, SE Asian Lunar New Year shutdowns and still-struggling European economies.

Electronic equipment shipments in SE Asia plunged in February and made only a modest recovery in March (Chart 1). First quarter revenues for the large Taiwan-listed ODM companies dropped 11% compared to the same quarter in 2012 (Chart 2) and in the USA electronic equipment orders remained quite flat (Chart 3).

Semiconductor shipments (Chart 4) dipped in February in all regions with their decline the sharpest in SE Asia (New Year holiday shutdowns) and the USA (correction for excess chip orders in late 2012).

More recently the saber rattling by N. Korea has created potential threats to the electronic supply chain. S. Korea is a major electronics supplier. Based upon recent records its companies produce 4% of the world's electronic equipment but 12% of the world's PCBs and 52% of NAND and 67% of DRAM devices. S. Korea consumes 16% of the world's semiconductor materials and purchases 25% of global SEMI equipment shipments. Both component supply and pricing could easily be disrupted and adjacent countries could be affected by Korean peninsula unrest. Hopefully by the time this article is published sanity will have prevailed!

Looking forward mobile and smart device sales are booming, filling the vacuum left by declines of desktop PCs and conventional mobile phones (Chart 5) and leading indicators (Chart 6) are pointing to resumed world manufacturing growth this spring.

Chart 7 summarizes the current thinking regarding 2013 growth of the electronics supply chain. Let's hope that unrest in Korea does not derail the recovery!

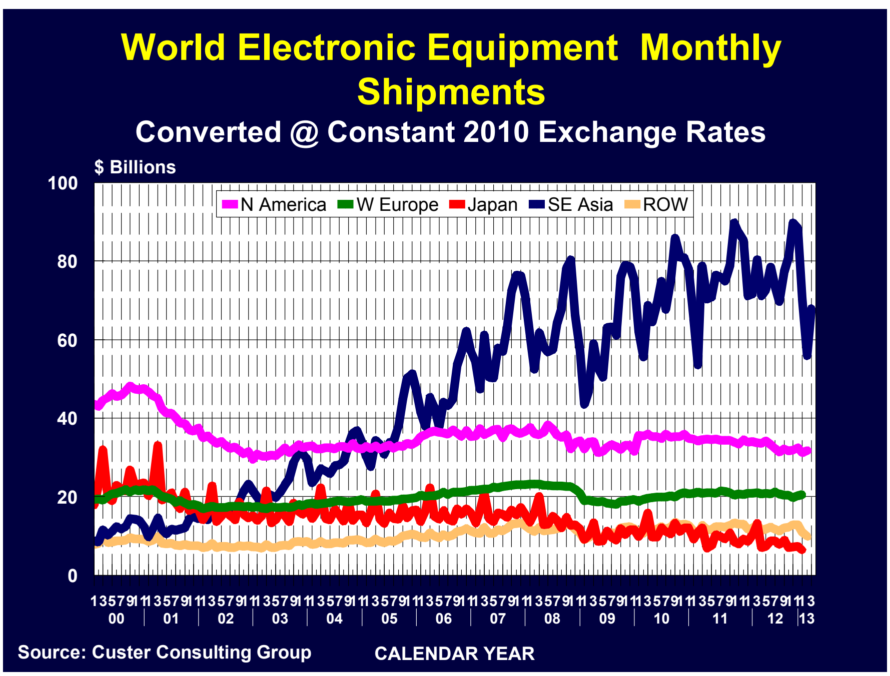

Chart 1.

End markets

World

- Worldwide IT spending forecast was modified slightly to 4.1% y/y increase to $3.8 trillion in 2013.—Gartner
- Computers & Peripherals
- Worldwide PC shipments declined 13.9% y/y to 76.3 million units in 1Q13.—IDC
- Worldwide high performance computing technical server market increased 7.7% y/y to $11.1 billion in 2012.—IDC
- Worldwide PC, tablet and mobile phone combined shipments are forecast to reach 2.4 billion units in 2013.—Gartner
- Worldwide tablet sales are expected to grow 28% y/y to $64 billion (150 million units) in 2013.—ABI Research

Consumer electronics

- Worldwide Consumer robotics market is forecast to grow from $1.6 billion in 2012 to $6.5 billion in 2017.—ABI Research

Other

- Game console shipments shrank 25% y/y to 30 million units in 2012.—ABI Research
- TV shipments fell over 6% y/y to 233 million in 2012.—NPD DisplaySearch
- Optical transport network transport and switching equipment market grew 8% y/y to $7.3 billion in 2012.—Infonetics Research
- Automotive electronic equipment, sales is expected to grow from $189 billion in 2012 to $274 billion by 2017.—Strategy Analytics

- External controller-based disk storage market grew 1.9% y/y to $6.0 billion in 4Q12.—Gartner
- PC monitor shipments are expected to decline 6.0% y/y to 140.1 million units in 2013.—IDC
- Smart connected device shipments grew 29.1% y/y to over 1 billion units valued at $576.9 billion in 2012.—IDC

EMS, ODM & related assembly activity

Cell phone OEMs (with their own manufacturing facilities) accounted for 73.4% of all phones manufactured in 2012.—IHS iSuppli Research

EMS medical market generated revenue of approximately $16.56 billion in 2012 and is expected to grow at 11.0% CAGR between 2012 and 2019.—Frost & Sullivan

Top 50 EMS sales grew 4.8% y/y to new high of USD 223.9 billion in 2012.—Manufacturing Market Insider

Artaflex consolidated its common shares on the basis of 1 post-consolidated common share for each 2,500,000 pre-consolidated common shares in order to go private.

Axis added second Takaya APT-9411 flying probe system.

BB Electronics eliminated 100 positions in Horsens, Denmark.

Bestronics tripled its manufacturing facilities to 71,750 SF in San Jose, California.

Carson Manufacturing Company purchased a Rhythm selective wave soldering system.

Dena Technologies added a high performance line from APEX Factory Automation which includes a SJ Innotech HP-520S printer with 2D inspection and Mirae MX200LP high speed placement system.

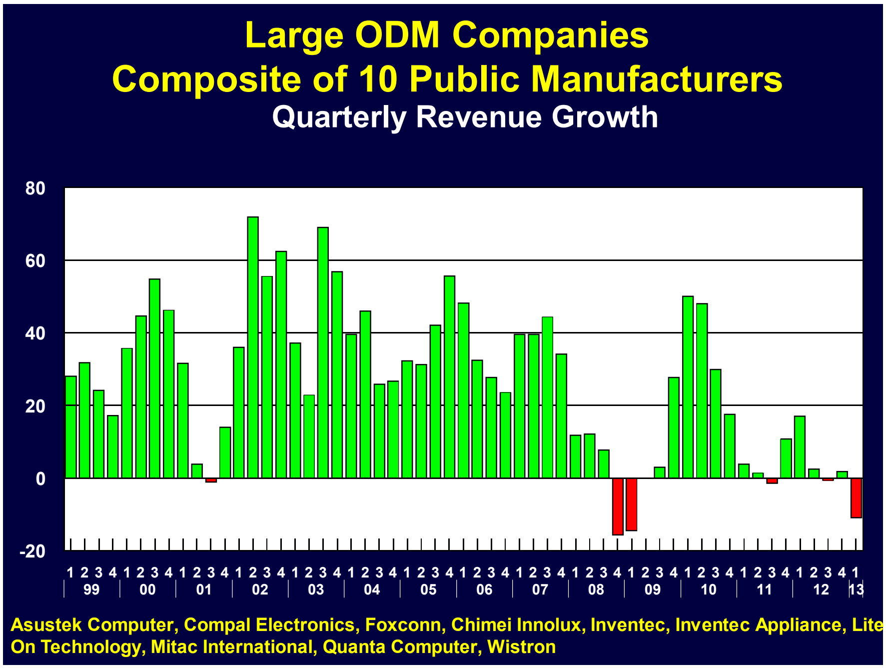

Chart 2.

Distron Corporation (Attleboro Falls, MA) added a 3D inline SPI system from ASC International.

Ducommun appointed Richard Baldridge and Gregory Churchill to Board of Directors.

Electro Assembly Services received ISO9001:2008 accreditation.

EPIC Technologies named Joe Rogers, Sr VP of Global Operations.

Flextronics added Amber Road's restricted party screening on-demand solution.

Foxconn International Holdings changed its name to FIH Mobile Limited.

Iftest AG acquired UL certification ZPVI2.

Kingfield acquired 40,000 FT facility in Chesterfield, UK.

North American Interconnect received Nadcap merit status for electronics cable and harness assemblies.

OnCore Manufacturing opened 88,000 SF facility in Tijuana, Baja California, Mexico.

PartnerTech appointed Peter Nilsson, Ex. VP, Operations for Electronics and Systems Integration & Enclosures and Mats Lundin, VP Supply Chain.

Petronics Electronica Assemblage added a Mydata MY12 component placement machine.

Probe Manufacturing acquired Trident Manufacturing.

Qualitel installed its 4th X5 Prof Stencil Printer from EKRA.

Regal Research and Mfg added a third shift and five new pieces of CNC machining & lathe equipment in Plano, Texas.

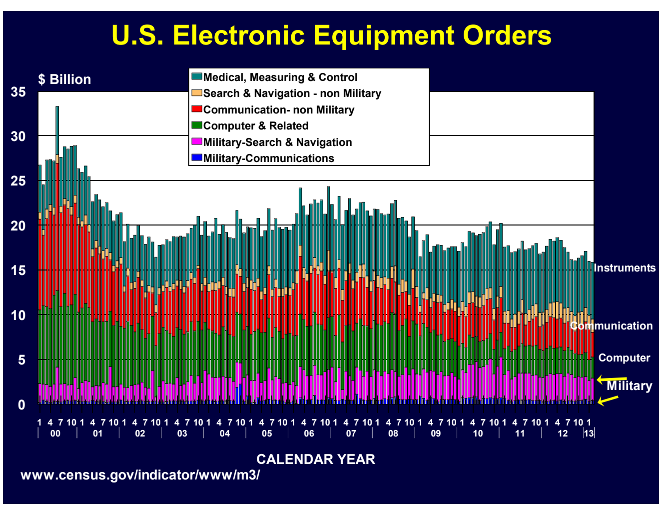

Chart 3.

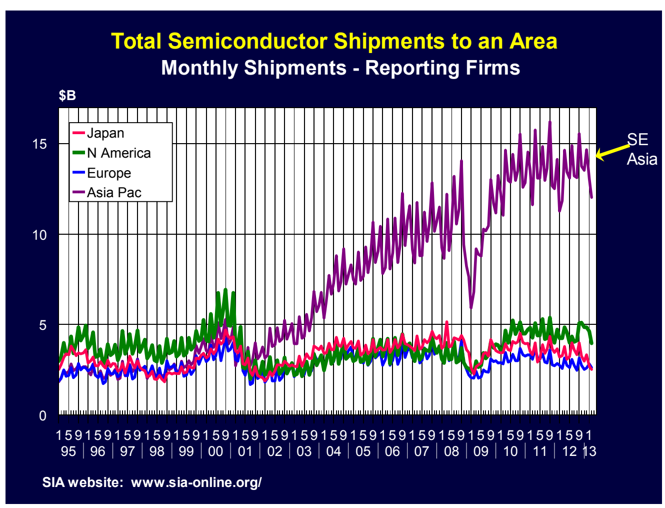

Chart 4.

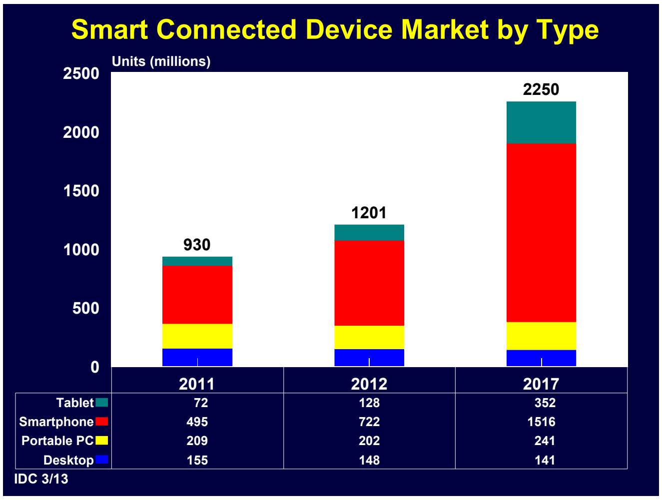

Chart 5.

Chart 6.

ROB electronic and subsidiaries applied for insolvency proceeding.

Saline Lectronics appointed Davina McDonnell to West Coast Business Development Manager.

Samsung plans to open a television, laptop and printer assembly plant in Kenya by end of 2013.

SMS electronics appointed Mike Gutteridge, Business Development Manager of Product Services.

SMT Nuremberg installed Aegis Software FactoryLogix suite.

Steca added a Mek iSpector HDL 650 AOI system.

Vermont Electro-Mechanical Assembly Services celebrated twenty years in business.

PCB fabrication

China's PCB production grew approximately 6-7% (based on preliminary data and measured in US dollars) in 2012.—Dr. Hayao Nakahara

PCB & MCM design automation revenue increased 19.5% y/y to $167.0 million in 4Q12.—EDA Consortium

Metal in board shipments are expected to grow on 12% annual average from $1.6 billion in 2012 to close to $4 billion in 2020.—BPA

Alba Elettronica added a Sprint 120 inkjet legend printer from Orbotech.

Dainippon Printing sold some of its B2it production lines to Unimicron subsidiary, Clover Electronics.

Eurocircuits opened PCB plant in Gandhinagar, Gujarat, India.

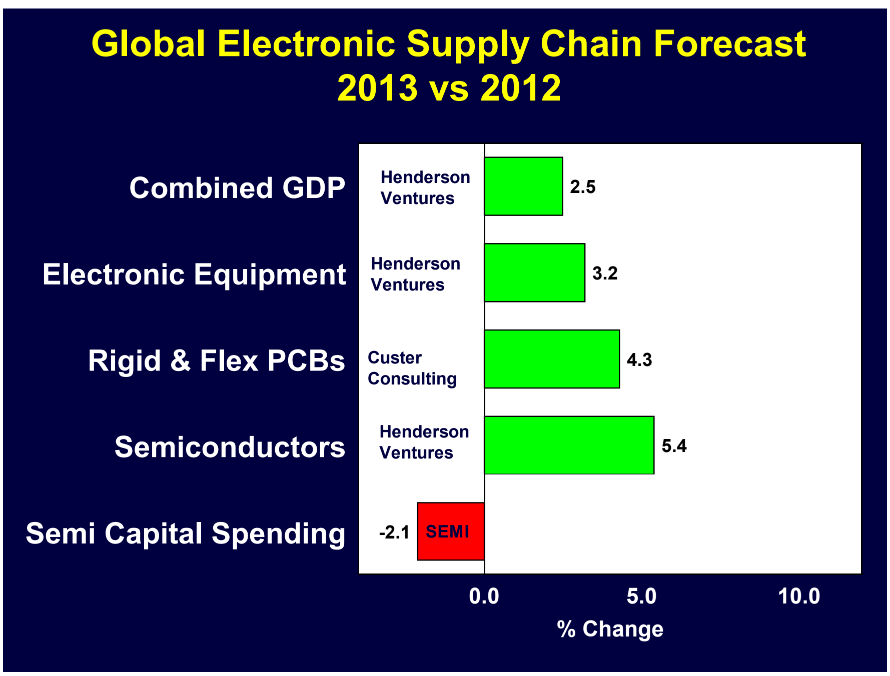

Chart 7.

Hallmark Circuits invested USD 5 million in new equipment which includes: Schmoll machines, Atotech Oxide Replacement line, Variable-speed compressor and an Orbotech Paragon 8800 LDI and Fusion 22 AOI.

Hitachi Computer Technology & Manufacturing was consolidated into Hitachi Storage Manufacturing and renamed Hitachi Information & Telecommunication Manufacturing.

Hitelap added a Limata LDI system.

IPC named Randy Cherry Director of New Validation Business Unit.

KCE Electronics is building 700K SF/month PCB plant in Ladkrabang, Thailand.

Lab Circuits received UNE-EN 9100:2010 certification for its Quality Management System.

MEN Mikro Elektronik was acquired by Equita.

Panasonic scaled down ALIVH board production capacity in Taiwan and Vietnam.

Printca added a plating line in Aalborg, Denmark.

Prototron Circuits added Maskless Lithography MLI 5600 digital imaging system in Redmond, Washington.

TTM Technologies sold its 70.2% equity interest in the Shengyi Technology plant in Dongguan, China to Sytech and acquired Sytech's 20% equity interest in the DMC plant.

Materials & process equipment

Amphenol appointed Steve Roberts, UK GM.

Clariant bought Nano-Silver Ink technology from Bayer.

DELO Industrial Adhesives named Torsten Uske, President of its North American subsidiary, DELO Industrial

Adhesives LLC.

Enthone appointed Sean Mirshafiei, VP, Global Electronics Marketing.

Essemtec hired Jürgen Seibert as Demo & Training Manager.

Indium created a nanotechnology team.

IPTE

- opened 2,250 m2 business facilities in Reus, Spain.
- Platzgummer named Albert Vontz, GM.

Isola enhanced its quick turnaround service to support PCB fabricators' Just-in-Time inventory requirements.

MIRTEC became exclusive five year/ AOI partner for Bosch.

Nordson

- appointed Gina Beredo Deputy General Counsel and Assistant Secretary.
- DAGE promoted Elaine Yeomans to Marketing Communications Manager.
- EFD is celebrating its 50th anniversary.

Rache developed proprietary laser cutting process that can cut .0005" to .060" thick ferrous metals and non-ferrous metal foils.

Taiyo America named Seiki Kashima, President and Director and Toru Fukata, COO.

Yamaha IM appointed Slawomir Florian, Business Development Manager for Poland.

Semiconductors & other components

Global LED lighting market is forecast to grow 54% y/y to US$25.4 billion in 2013.—Digitimes Research

Global NAND flash output value is expected to rise 25.5% y/y to US$25.39 billion in 2013.—DRAMeXchange

Global semiconductor market revenue fell 2.6% y/y to $299.9 billion in 2012.—Gartner

Global semiconductor materials market decreased 2% y/y to $47.1 billion in 2012.—SEMI

Power transistor sales are expected to increase 7% y/y to $13.2 billion in 2013 and 8% y/y to $14.3 billion in 2014.—IC Insights

Semiconductors used for in-vehicle connectivity and networking are forecast to grow from $438.8 million in 2011 to $841.8 million in 2018.—IHS

Worldwide semiconductor capital equipment market declined 15% from $43.5 billion in 2011 to $36.9 billion in 2012.—SEMI

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IC packaging technology and the pursuit of simplicity—

Continued from page 4

are wafer level packages (WLP), which are de facto chip size packages produced on the wafer. That said, there is a variant on wafer level packages referred to as fanout wafer level. In such constructions, the wafer is diced into individual dies and reconstituted as a larger sized "wafer," which allows the manufacturer to create redistribution wiring for the I/O of chips having I/O count to high and pitch to fine because of the small die size to be practical for use in traditional surface mount assembly.

In summary, the designer is confronted with a wide range of choices in terms of IC packaging format. The choices made are made to the exclusion of the other options (provided other options are available). One thing that the designer might consider is one which could make the design layout easier and more predictable and that is to specify the use of components that have a common grid pitch. This is consistent

"The designer is confronted with a wide range of choices in terms of IC packaging format."

with the ancient and time-honored call to simplify mentioned in the opening paragraph. It may not always be possible, but when it can be done it could prove beneficial. Seasoned circuit designers are certain to remember a time decades ago when all components were manufactured with leads on a simple common base grid. It was 100 mils at the time and it no longer makes sense today but others are possible. One reasonable pitch to consider is 0.5 mm. It might be a good exercise for the designer to lay out a board using only a single grid pitch, such as 0.5 mm, and assess for themselves whether or not it would be of value to them to consider the potential benefit of component and grid simplification.

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.