



2013 ends on a high note



Walt Custer and Jon Custer-Topai

Although business conditions were weak for much of last year they “ended with a bang.”

Electronic equipment shipments were up 6% globally in December 2013 vs. December 2012 (*Chart 1*) driven by a strong year end surge in SE Asia. The normal winter seasonal slowing was not yet evident in December based upon equipment shipments.

Components (which “lead” electronic equipment by about month in the business cycle), did peak in November. Printed circuit board sales edged down in December (*Chart 2*) and will likely continue to decline throughout the first quarter of this year.

Semiconductor shipments also finished last year on a positive note (*Chart 3*). They were up 6.8% on a 3-month average basis in November versus the same period in 2012 with shipments to N. America up a whopping 18.6%.

The N. American electronic supply chain finished 2013 on generally good terms. *Chart 4* shows the annualized (12/12) and 3-month (3/12) growth rates for November vs. the same period a year earlier. A value of 100 indicates no change. Except for passive component orders and shipments and computer orders all other categories were growing. Domestic electronic equipment orders rose 5.7% on a 3/12 basis in November 2013.

Thanks to our colleague Ed Henderson *Charts 5 & 6* provide his latest forecasts for GDP and electronic equipment growth by region by year. At this point 2014 looks like a year of solid “single digit” growth.

World

- IT spending is on pace to grow 3.1% y/y to \$3.8 trillion in 2014.—Gartner
- Technology sales reached \$282 billion in China in 2013, surpassing North American, which purchased

\$257 billion.—Consumer Electronics Association

- Technology spending will rise 6.2% y/y to US\$2.22 trillion in 2014.—Forrester
- Regional
- China smartphone sales will top 436 million units in 2014, with local handset suppliers shipping 279 million units.—Digitimes Research
- China-based makers are expected ship 575 million touch panels for smartphones, 165 million units for tablets and 10 million units for notebooks in 2014.—Digitimes Research

Mobile communications worldwide combined shipments of devices (PCs, tablets, ultramobiles and mobile phones) are projected to grow 7.6% y/y to 2.5 billion units in 2014.—Gartner

Computers & peripherals

- PC shipments declined 6.9% y/y to 82.6 million units in 4Q13.—Gartner
- Tablets shipments will increase from 141 million in 2012 to 243 million units in 2014 and 488 million in 2017. – HIS
- LCD monitor shipments will drop 5.1% y/y to 150 million units in 2014.—WitsView

Consumer electronics manufacturing revenue is forecast to fall 2% y/y to \$250.0 billion in 2014. – HIS

Automotive

- sales will rise 4% y/y to 87.4 million light vehicles in 2014.—Deutsche Bank
- TFT LCD shipments are expected to grow from 65 million units in 2013 to more than 90 million units in 2017.—NPD DisplaySearch
- self-driving cars will grow from nearly 230 thousand in 2025 to 11.8 million in 2035.—IHS

Medical electronics

- sales will grow 8% y/y to about \$50.9 billion in 2014 after rising 3% y/y in 2013 to \$47.3 billion.—IC Insights
- home healthcare applications sensor market to grow from \$559M in 2013 to \$1.2B by 2018.—Yole Développement

Military electronics

- land vehicle electronics market is forecast to hit \$3.3B in 2014.—Visiongain

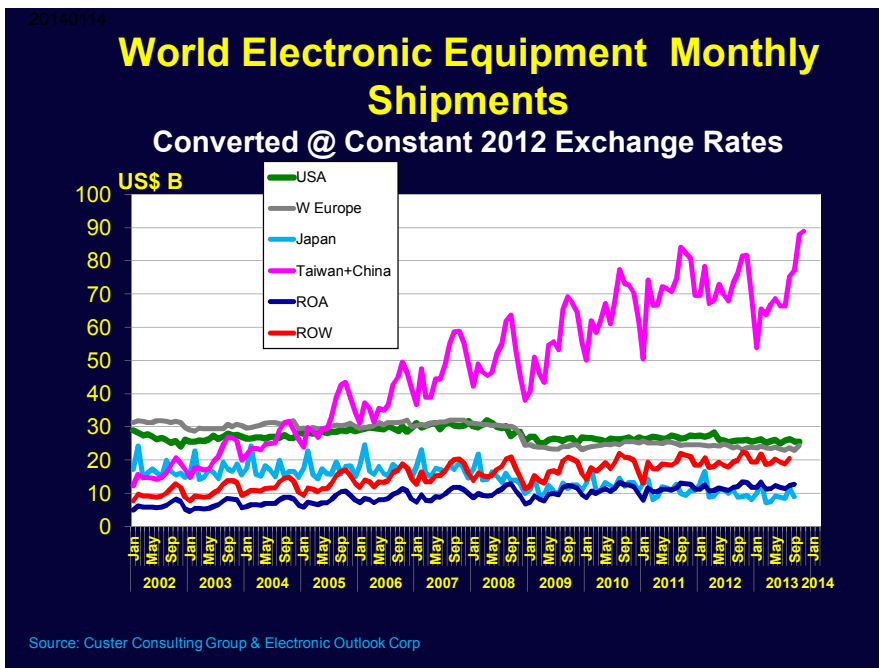


Chart 1.

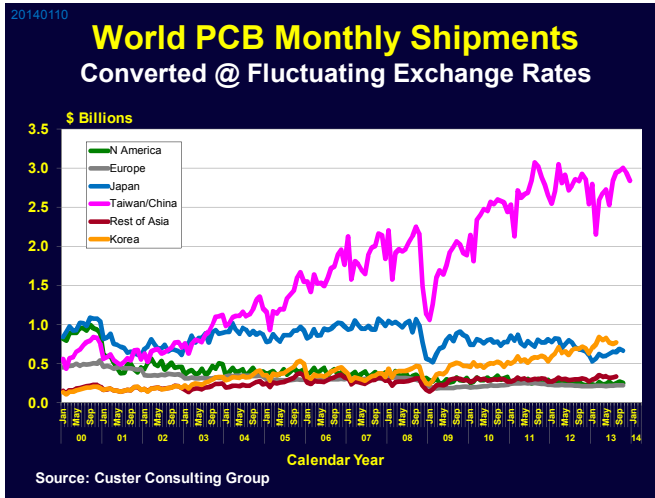


Chart 2.

Monthly Semiconductor Shipments
\$ Billions (3-month average)

	11/12	11/13	% CH
Americas	5.02	5.95	+18.6%
Europe	2.80	3.11	+10.9%
Japan	3.41	3.11	- 8.8%
Asia Pacific	14.28	15.07	+ 5.6%
Total	25.51	27.24	+ 6.8%

SIA www.sia-online.org/

Chart 3.

Present Growth Rates (%)
U.S. Economy & Electronics Industry

	Latest Month	Annual Growth	3-Month Growth
Electronic Component \$			
Rigid & Flex PCB Orders (N Amer)	11/13	98.9	101.3
Rigid & Flex PCB Shipments (N Amer)	11/13	96.6	102.1
Electronic Component Orders	11/13	97.8	97.8
Electronic Component Shipments	11/13	97.3	99.4
Semiconductor Shipments to N America	11/13	111.9	118.6
U.S. Electronic Equipment Orders \$			
Computer & Related	11/13	92.7	91.8
Communication	11/13	107.7	108.4
Medical, Measurement & Control	11/13	96.3	108.6
Search & Navigation	11/13	92.6	107.3
Defense Capital Goods	11/13	101.4	103.0
Military Electronics	11/13	90.6	108.4
Total Electronic Equipment	11/13	97.4	105.7
U.S. Industrial Production	11/13	102.5	103.3

NOTE: 3 month growth rates compare most recent 3 months to same 3 months one year earlier

Chart 4.

GDP Growth

Constant \$ Growth Rates Converted @ Constant Exchange Rates

	2012	2013	2014	2015	2016
World	2.5	2.4	3.2	3.9	3.7
USA	2.8	1.8	2.7	3.4	3.3
EU	-0.4	-0.1	1.1	1.5	2.0
Japan	1.4	1.9	2.0	1.6	1.2
Four Tigers	1.9	2.5	3.6	4.0	3.8
China	7.7	7.6	7.9	8.4	7.7

Henderson Ventures 1/2014
www.hendersonventures.com

Chart 5.

- & Aerospace industry will grow 5% y/y to U.S. \$1.4 billion in 2014.—Deloitte Touche Tohmatsu

Digital cameras

- module market will grow at a 19.7% CAGR between 2013 and 2019 from US \$12 billion in 2012 to US \$43.06 billion in 2019.—Transparency Market Research
- compact sales are likely to fall more than 40% y/y to fewer than 59 million units in 2014.—IDC

Flat panel displays

- LCD TV shipments will grow 3% y/y to 209.1 million units in 2014 after falling 1.7% y/y to 203.1 million units in 2013.—WitsView
- 4Kx2K TV shipments are expected to grow from 1.9 million units in 2013 to 12.7 million units in 2014.—NPD DisplaySearch
- TFT LCD area demand will increase 9%, from 141 million m² in 2013 to 154 million m² in 2014.—NPD DisplaySearch
- AMOLED light-emitting materials will expand from US\$350 million in 2013

to US\$445 million in 2014.—IHS

LED lighting

- sales are expected to increase 15-20% as prices drop 20% through 2015.— HIS
- applications will increase from \$3.6 billion in 2013 to \$5.6 billion in 2014 and \$7 billion by 2016.— HIS

RFID market will grow from \$7.88 billion in 2013 to \$9.2 billion in 2014.—Bharat Book Bureau

Smart technology

- Internet of Things installed base will grow to 26 billion units by 2020, with incremental revenue exceeding \$300 billion.—Gartner
- gesture-sensing smart devices will expand nearly 70% y/y to nearly 330 million in 2015.—NPD DisplaySearch
- motion control product sales hit \$12.2 billion in 2013.—IHS
- intelligent lighting sensors and network control gear will grow from \$1.1 billion in 2013 to nearly \$2.7 billion by 2020.—Navigant Research

Wearable devices

- for infotainment application shipments will rise by 155% from 51.2 million in

2013 to 130.7 million units in 2018.— HIS

- for fitness market reached over \$330 million in 2013.—NPD Group
- Video gaming market is forecast to grow 11.1% y/y from 53.9 billion Euros (US\$73.8 billion) in 2013 to 82.1 billion Euros in 2017.—IDATE

Electronic waste weight will rise from 48.9 million tons in 2012 to 65.4 million tons in 2017, with most of the growth in developing nations.—StEP

EMS, ODM & related assembly activity

North America EMS growth is expected to decline 0.4% to \$45.5 billion in 2014.—IHS
Top five contract makers' (Quanta, Compal Electronics, Wistron, Inventec and Pegatron) notebook shipments grew 4% q/q to 37.23 million units in 4Q13.—Morgan Stanley

Cicor Electronic Solutions and **Cicor Asia** divisions were merged into "Electronic Solutions" division.

Electronic Equipment Production Growth

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Constant \$ Growth Rates Converted @ Constant Exchange Rates

	2012	2013	2014	2015	2016
World	1.0	-2.6	4.8	6.0	5.8
USA	-0.9	-3.4	3.0	5.0	5.2
W. Europe	-3.4	-5.2	1.5	3.4	3.8
Japan	-2.6	-8.6	3.5	4.4	3.6
Four Tigers	-1.2	1.8	4.6	5.8	5.2
China	2.6	-2.3	6.4	7.1	6.5

Henderson Ventures 1/2014
www.hendersonventures.com

Chart 6.

Computrol is celebrating its 30-year anniversary in 2014.

Connect Group obtained ISO 13485 medical certificate for its facility in Poperinge Belgium.

DfR Solutions entered government/military equipment collaboration with Circuit Solutions.

ESCATEC Switzerland became a founding member of the professional group "Photonics" at SWISSMEM.

Express Manufacturing Inc.

- subsidiary, EMI Asia Limited received EN/JISQ/ AS9100:2009.
- added smaller packaging manufacturing technologies and NPI program will shorten time-to-market for medical devices.

Foxconn/Hon Hai

- is building a panel and touchscreen technology R&D center in Hsinchu, Taiwan.
- launched investment fund will finance startups developing new kinds of wearable computers.
- started operations at first store-factory complex in Quiyang, China.
- began production at its new demonstration plant in Guiyang, China.
- plans to build a handset plant in Indonesia's Jakarta or the Yogyakarta Special region.
- is moving 60-inch and 70-inch flat-screen TV manufacturing from Mexico to U.S.

Global-Tech Advanced Innovations ended EMS Business operations.

Jabil sold its aftermarket services business to iQor for \$725 million.

JJS manufacturing launched new website, www.jjsmanufacturing.com.

Kimball International appointed Lonnie Nicholson, CIO and Timothy Jahnke to the Company's Board of Directors.

Kitron terminated plan to establish common distribution center.

Lite-On Technology merged with Leotek Electronics, Lite-On Clean Energy Technology,

MET opened a manufacturing facility in Melbourne, Florida.

Michigan Manufacturing International opened new HQ in Stevensville, Maryland.

Microtek Labs opened new test facility in Linthicum Heights, Maryland.

NATEL named Warren Dannelly, Director of Sales and Victor Yamauchi, VP of Continuous Improvement.

Neways Electronics Production closed and transferred all Kassel, Germany production activities to other Neways operating companies.

Nortech Systems appointed Richard Wasielewski, President and CEO.

Pegatron chairman, TH Tung was named Taipei Computer Association Chairman.

Permatech added a Siemens SIPLACE POE S27 pick and place machine.

Sanmina appointed Michael Clarke and Eugene Delaney to Board of Directors. SMTC appointed Sushil Dhiman, President and CEO.

STI Electronics opened new IPC approved training center in Houston, Texas.

Surface Mount Technologies, Inc. teamed with Eruston to offer complete turnkey

manufacturing.

Surface Technology International received £11.5million financing package from Lloyds Bank Commercial Banking

Symprotek added high performance production line from APEX Factory Automation which includes: SJ Inno Tech 3D printer, SJ Inno Tech HP-520SPI, cTS-Monvection reflow and Mirae Mx400L and Mx400LP placement machines.

TT electronics

- relocated Werne, Germany manufacturing operations to lower cost regions.
- IMS opened 50,000 SF manufacturing facility in Timisoara, Romania.

VirTex Enterprises acquired MTI Electronics.

PCB fabrication

Global brand motherboard shipments fell from 80 million units in 2012 to 75 million units in 2013; Asustek Computer and Gigabyte Technology will aggressively compete for the number-one spot in 2014.—Digitimes

Top 5 PCB makers in 2013 that achieved sales revenues greater than \$2 billion are: Nippon Mektron, Unimicron, Samsung Electro-Mechanics, Young Poong Group and Zhen Ding Technology.—Dr. Hayao Nakahara

ADCO Circuits purchased a second Ersu selective soldering machine.

AT&S

- appointed Karl Asamer, CFO.
 - closed its Klagenfurt, Austria facility.
- Circuit Technology Inc.** opened a training center in Melbourne, Florida.

Compeq first-phase construction of new Chongqing, China plant is expected to be completed in mid-2014 with an installed capacity of 200,000-300,000 SF of HDI boards.

Diagnosys appointed Sergio Moreno VP Sales, Latin America.

Eagle Circuits received Integral Technology's Zeta® certification.

Greule filed for insolvency.

GUH Holdings spent RM20mil to expand its Penang and Suzhou plants by about 50% to 807,000 SF.

Ibiden is investing \$400 million into a second HDI plant in Malaysia.

Icape Group became fully compliant to "conflict-free minerals" regulations. Mitsubishi Material developed DBA printed circuit board with thick copper conductors for the next generation power modules.

Nanya PCB invested NT\$1.5 billion to expand FC CSP substrate capacity in 2013.

NCAB Group Germany appointed Heinie von Michaelis, Managing Director

Panasonic will discontinue production of ALIVH boards in 2014.

Q.P.I. Circuits and **Q.P.I. Electronic Design Automatisat** merged into new subsidiary, Q.P.I. Group B.V.

RASP moved from South Glens Falls to 22,000 SF building in Moreau, New York.

Schweizer Electronic

- and Elekonta entered collaboration for HDI, thick copper, HF and impedance-controlled PCBs.
- received EN 9100 aerospace industry certification.

SEMCO is building a new HDI plant in Vietnam.

Spirit Circuits acquired Lyncolec.

Taiwan PCB Techvest expanded monthly production capacity in Chongqing, China to 900,000 SF in 2013.

Tramonto Circuits named John Talbot, President.

Twisted Traces moved to new facility in Elk Grove Village, Illinois.

Unimicron is investing \$500 million to build an IC substrate manufacturing plant in Kweishan, Taiwan.

Unitech plans to increase its HDI board production capacity by removing bottle-necks in 2014.

Materials, process & test equipment

SMT equipment market to reach a global value of \$5.3 billion by 2018; Latin America will grow at a 7.2% CAGR of over the next five years.—Global Industry Analysts

Agilent Technologies named the electronic measurement company it expects to spin off in early November 2014, Keysight Technologies.

Air Products and Chemicals opened a manufacturing facility in Manatee County, Florida.

Alpha's Altoona, Pennsylvania, facility was certified as compliant conflict-free smelter. Atotech won patent infringement lawsuit

in Taiwan for Stannatech® process and equipment.

Camtek Board reappointed Rafi Amit, CEO.

Cogiscan is celebrating 15-year anniversary.

CyberOptics appointed Executive Chairman Subodh Kulkarni as interim CEO after Kathleen Iverson retired.

Datest is commemorating 30 years in business in 2014.

Dymax hired Paul Rachielles as Global Marketing Manager.

ETI/NEA expanded its production floor by 40% at its Hudson, New Hampshire

facility.

Eucon Holding ended laser drilling operations.

GOEPEL electronic and **Teradyne** developed an extended Boundary Scan option for production In-Circuit Test/Functional Board Test of PCBs and the modular functional testers on VXI and PXI Express basis.

Isola

- transitioned manufacturing of its low-loss, I-Speed material to Asia.
- Suzhou plant received ISO/TS 16949 certification.

JUKI unveiled optical inspection machine “RV-1” for component mounted circuit boards.

Korean SMT Solutions began electronics equipment assembly distribution operations for Estonia, Lithuania and Latvia, Russia, Ukraine, Belorussia, Moldova, Kazakhstan.

LPKF acquired outstanding shares in Slovenian subsidiary LPKF Laser & Elektronika Naklo, Slovenia.

Marubeni co-developed a new fine line printing process using sub-micron gold powder which is bondable at 200 degree C and heat resistant at 300 degree C.

Niching Industrial spent NT\$125 million (US\$4.16 million) to purchase building to set up nano silver paste production lines.

Nordson Advanced Technology Systems moved to new facility in New Taipei City, Taiwan.

OK International appointed Christopher Larocca, President.

Orbotech Korea employees were acquitted on charges of theft of corporate secrets from LG and Samsung.

Toppan Forms developed new silver printing process with very low firing temperature (80°C) using silver salt ink.

Semiconductors & Other Components

Global semiconductor sales increased 4.9% to \$317.9 billion in 2013.—IHS preliminary estimate

DRAM chip production is expected to increase 32.5% y/y to US\$35.2 billion in 2013, after contracting 24.6% in 2011 and 9.8% in 2012.—TrendForce

Flip chip technology market is reached \$20.1 billion in 2013.—BCC Research

High-brightness LED chip production will increase 129% y/y to US\$12.743 billion in 2014. -Digitimes

Magnetic sensors market revenues are forecast to grow from \$1.66 billion in 2012 to \$3.51 billion in 2019 on smartphone and automotive segments.—Frost & Sullivan

Microcontroller market revenue will grow

15% y/y to US\$17 billion in 2014 driven by internet of things, solar, smart-home, and electric vehicles.—EMITT Solutions

NAND Flash revenue will grow by 13% y/y to \$28 billion in 2014.—DRAMeXchange

Power semiconductor discretes and modules revenue reached slightly less than \$15 billion in 2013.—IHS

Power semiconductors in the automotive industry will grow from \$2.81 billion in 2012 to \$5.28 billion in 2018.—Frost & Sullivan

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