

Evolution of SMT Manufacturing in Southern China

This month's column was jointly written by Dr. Jennie S. Hwang and Ricky Yeung.

Despite the recent tension between the United States and China, the electronics industry relentlessly marches on. Demands for better and lower cost information hardware are ever increasing. One of the most vibrant manufacturing areas on the global map is Southern China. In the July 1997 issue of *SMT*, this column offered a sketch of the

growth, both before and after it was returned to China on July 1, 1997. Prior to the late 1980s, there were hardly any significant electronics factories assembling printed circuit boards (PCB) with SMT around the Pearl River Delta Region in the Guangdong Province of China. Recently, multinational corporations such as IBM, Nokia, Sanyo, GUC, Natsteel and Celestica, as well as Hong Kong-based companies such as Wong's and VTech, have begun

the-art technology. With ardent government support, HKPC took the initiative and set up an SMT lab. HKPC's mission was to encourage the local industry users to learn the technology by providing resources and facilities. The SMT lab offered consultancy, prototyping, quality and reliability verification, and other support services.

In conjunction with the lab, the Hong Kong SMT Users Club not only delivered expertise and know-how but also provided an effective communication platform for its members. Local manufacturers learned from each other and created business networks. The Users Club, comprised of both suppliers and users, organized technical seminars, study missions, exhibitions and forums. Contributors included industry speakers such as Dieter Bergman, Vern Solberg and myself. The club has since trained thousands of engineers.

With the effort of HKPC, along with the industry-wide establishment of SMT, Hong Kong has provided a pool of managers and technical personnel able and ready to serve the SMT manufacturing sector.

Migration and Development of Manufacturing Operations

Low labor cost, an abundant supply of workers and economically attractive land made Southern China an appealing area to build manufacturing facilities. Consequently, Hong Kong electronics companies began to relocate their operations to Southern China in the late 1980s. In the past several years, companies in Taiwan have also moved high-volume production facilities to Southern China.

Guangdong Province was granted special autonomy and reform status in 1979 and authorized in 1980 to

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electronics industry in China ("The Electronics Industry in China," p. 24-26). Excerpts from this column include: "China's market for electronics products is expected to top \$120 billion by 2000 and a potential \$720 billion by 2010. The electronics industry is one of several industries, including auto, chemical, aviation and banking services, designated by the government as 'pillar' sectors. ... China is poised for the speedy development of the electronics industry. ... With all the challenges and evolutions, one thing that cannot be ignored is the market power of our world's most populous country."

Two years later, impressive growth from China's electronics market has indeed materialized and a solid electronics manufacturing infrastructure has been developed. Many companies from the United States, Japan and Europe have benefited from the development of this region.

Hong Kong has played a pivotal role in Southern China's industry

to populate Southern China, particularly in Shenzhen and Dongguan. In addition, China-grown companies such as Legend and HuaWei are also harbored in this region.

Hong Kong's Role

Hong Kong started adopting SMT in 1987; Astec, Miniscribe and Wong's were among the trendsetters. In addition, small and medium enterprises with long histories in electronics assembly promptly implemented SMT and offered subcontracting services to large Hong Kong-based companies. This helped the dissemination of SMT in the region. However, some challenges did make the initial SMT implementation slower than desired, namely: high start-up capital investment, low technological expertise and the limited supply of surface mountable components.

At the time, the Hong Kong Productivity Council (HKPC) envisioned the need for state-of-



experiment as a Special Economic Zone (SEZ). The SEZ includes Shenzhen, Zhuhai and Shanton. Shenzhen and Doughtuan have gradually become the most fertile areas for establishing electronics companies because of their proximity to Hong Kong and their internal emphasis on the electronics industry.

In the beginning, transferring through-hole assemblies and manual soldering were the primary actions. With the success of these operations, companies started to relocate

SMT facilities in the early 1990s. To ensure quality and reliability, the SMT operations were first managed by expatriates. In the meantime, these expats introduced training, skills, expertise and management to the local workforce. As demands for training increase, major equipment suppliers such as Fuji, Panasonic and Speedline set up training centers in the Futian Free Trade Zone of Shenzhen. The Futian area allows companies to easily move equipment, making it a

major SMT equipment demonstration and training center within China.

Today's Chinese engineers and technicians are well positioned for working with SMT manufacturing.

Manufacturing Hub

New and renewed issues in trade and politics continue to evolve and to be resolved. Business queries continue to be raised and answered. Nonetheless, Southern China has turned into an SMT manufacturing hub for China. Companies now are willing to invest in this region to utilize its established infrastructure and the availability of skilled workers and engineers. The United States, Europe and Asia have made sizeable investments to build up manufacturing facilities. For example, Taiwan has invested \$30 billion in China.

General Economy

With respect to the overall economy, China's gross domestic product (GDP) grew by 7.6 percent, ahead of the official 7 percent growth target for the first half of 1999. The economy expanded by 7.8 percent in 1998 (*The Wall Street Journal*, July 16, 1999). According to *The China Economic Times*, China's international payments were in balance and the nation's currency was stable, although some state economists have called for a retreat from its no-devaluation pledge.

China continues to welcome electronics companies all over the world to invest and to work hand-in-hand in fostering the development of electronics industry. **SMT**

DR. JENNIE S. HWANG, an *SMT* Editorial Advisory Board member,

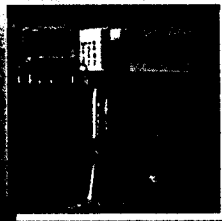
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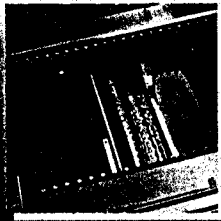
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