

# Making Music in Korea

*“Dealers now insist that our products are certified as ICT tested on GenRad equipment - it has become the basis of our marketing campaign.”*

*Y G Lim, Test Manager, Young Chang*

A fine piano is an investment that will enrich the quality of life. The design and craftsmanship of the piano is an art steeped in old world tradition dating back over three centuries.

Young Chang is a relative newcomer in an industry where many of the leading manufacturers are well over 100 years old. After only 40 years or so, the South Korean company has grown to become one of the largest piano manufacturers in the world, with the capacity to produce more than 135,000 pianos in a year.

Young Chang's heritage represents the innovation and skill of three individuals whose obsession was to create excellence. It was in 1956 that the Kim brothers, Jai-Young, Jai-Chang and Jai-Sup, combined their financial, musical and engineering talents to create South Korea's first musical instrument manufacturing company.

Just 15 years after assembling its first piano, Young Chang began exporting world-class pianos and became the first non-Japanese musical instrument manufacturer, and one of only a few piano manufacturers to be awarded the prestigious Japanese Industrial Standards mark for consumer product quality assurance. A second factory was opened in Incheon, Korea, in 1976. The 680,000 square-foot factory was

completed in late 1979. The early 1980's saw exports exceed US \$10 million, recognized by an export award from the Korean government. Young Chang founded European, US and Canadian operations in 1984, and in the same year became the first public corporation in the Korean music industry.

Young Chang entered the digital keyboard market by acquiring selected assets of Kurzweil Music Systems in 1990 and now develops, manufactures and markets both professional and home digital keyboards under the Kurzweil brand name.

Kurzweil Music Systems Inc. was founded by inventor Raymond Kurzweil, who had developed a revolutionary reading machine for the blind. Musician Stevie Wonder, a customer for the reading machine, challenged Ray Kurzweil to create an electronic instrument that blended the richness of acoustic sound with the control and sound modification of electronics. The Kurzweil engineers then developed the first ROM-based sampling keyboard to successfully reproduce the full complexity of acoustic instrument sounds - the K250. The music industry was astounded by its ability to emulate a piano, strings, choirs, drums and other acoustic instruments with extraordinary accuracy. Since then, electronic musical instruments have had a new benchmark of quality for which to strive.

The acquisition of Kurzweil brought with it a range of manufacturing and logistical problems, as

自从15年前装配第一台钢琴以来，Young Chang公司开始出口钢琴，并成为第一家因消费品质量保证而获得显赫的日本行业标准标记的非日本乐器制造商。该公司生产世界上最受推崇的电子钢琴之一，但在出现质量保证方面的问题后向GenRad求援，第一个GR228x系统于1997年安装，在此后的三年内，该公司的电子故障几乎降低为零。





*Kurzweil's K2600 synthesizer offers 400+ programs, state of the art interactive sounds, effects, 8 sliders, 2 wheels, 5 pedals and breath controller.*

explained by Hal Chamberlain, Senior Systems Engineer based in South Korea and the man charged with managing the manufacturing process.

“In the early 90’s Kurzweil struggled with quality problems. PCB’s were assembled without quality standards or adequate test procedures. We had a few oscilloscopes for component testing and repair, but ultimately the product was tested on assembly. If it made musical notes, it was passed. However, production people were not musicians and many keyboards were making their way to the dealer showrooms and even into the customer’s hands with serious defects affecting the performance and sound of the product. Piano players were far more critical of minor defects affecting the sound quality of the instrument - defects which the manufacturing engineers were unable to identify. We embarked on a project to persuade the Korean management to implement In-Circuit Testing (ICT), arguing that the cost of replacing and repairing faulty keyboards was already affecting the company’s performance and reputation.”

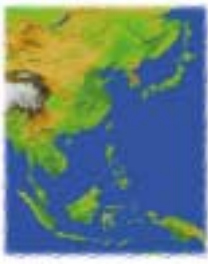
The result was a \$20 million investment which included GenRad test equipment and the start of a three year project to radically restructure test facilities as explained by Y G Lim, Test Manager at Young Chang.

“GenRad was selected for several key reasons. The Windows NT operating environment was crucial since test programs are generated at the research and development office in Waltham,

USA, but debugging takes place at the manufacturing centre here in Korea. Engineers required a consistent platform working under accepted industry standards. Since the company produces in excess of 12,000 boards per year, each with an average component cost of \$2500, fast throughput is important, with high fault coverage. Over 40% of the cost of each instrument is electronics. GenRad’s test machines provide MDA, ICT and functional test options which suit the complexity of the Kurzweil products. The GenRad testers are also now used to program ASICs, PALs and flash memory chips during production; devices which play a key role in the keyboard. The program code which creates even the most basic musical sounds is over 4 Mbytes and we offer hundreds of add-in sound files or memory modules which can be installed or downloaded from the company’s website.”

The first GR228X tester was installed in 1997 and over the following three years, the company has reduced electronic failures in the field to virtually zero. “Almost all of our repair problems are now mechanical,” says Chamberlain, “And usually relate to wear and tear rather than manufacturing defects. Our ICT facilities have become the first stage in a rigorous test process which includes manufacturing defect analysis, verification of component values and placement, electronic test and precise audio tests which measure frequency response and distortion in the sound of the keyboard. We will often replace components which fall *within* the manufacturer’s tolerances in order to create a





more accurate sound. Final functional testing is performed after box build to verify the sound quality as well as the action (ie: the feel of the keyboard when played.)”

By the year 2000, Young Chang had regained the confidence of the professional piano playing market and dealers were showing such interest in the manufacturing side of the product that the company used its test strategy as the basis of a new marketing campaign, offering products as ‘certified ICT tested’.

Raymond Kurzweil has long since left the company, but Kurzweil’s reputation continues to grow as new technologies are developed and Kurzweil engineers sample new sounds from around the world, using state of the art digital technology to add to the sound library. Today the Kurzweil product line features a wide array of electronic instruments for both the home and professional musician.

Kurzweil Music Systems’ Professional Products continue to be the choice of leading musicians, recording studios and institutions because of Kurzweil’s critically acclaimed sound library, extraordinary functionality, and industry-leading technology. In addition, Kurzweil Digital Home Products offer consumers the same world-renowned Kurzweil sound quality as the professional products, plus handcrafted cabinets and top-quality built-in audio systems. It is tempting to claim that GenRad was *instrumental* in creating this world class musical success!

## Awards



- 1991 Music Magazine in the USA (KEYBOARD)  
“The World’s Best Digital Piano”
- 1992 Music Magazine in Japan (KEYBOARD)  
“The Best Keyboard of This Year”
- 1993 Music Magazine in the USA (MIX)  
“Technical Excellence and Creativity of This Year” Award
- 1995 Music Magazine in France (Le Monde de la Musique) “The World’s Best Digital Piano”
- 1995 Music Magazine in the USA (MIX)  
“Technical Excellence and Creativity of This Year” Award
- 1996 Music Magazine in the USA (MMR) “The Best Digital Piano in 1995”
- 1996 Music Magazine in the USA (EMM) “The Best Synthesizer” Award
- 1997 Music Magazine in the USA (MIX)  
“Technical Excellence and Creativity of This Year” Award
- 1999 Music Magazine in the USA (MIX)  
“Technical Excellence and Creativity of This Year” Award

