IDD's New Unicorn Products 'Step Beyond' the Japanese

In today's world, manufacturers of electronic products are trying to emulate the Japanese approach to production. The Unicorn products recently introduced by IDD go a step beyond what is being done in Japan.

Jerry Ramey, GDP Business Unit Manager: "The reason is that the Japanese are still using standard mechanical design approaches with a lot of capital equipment and robotics, to reduce labor content. What we've done is to take out all of the mechanical processes and reduce it to a very small number of components."

A typical product requires 35 days to bring in the components, put them through ECB, get them into the assembly area and then actually produce the product. On Unicorn, this process has been reduced to two to three days. Final assembly takes one person five to seven minutes to complete.

On Unicorn, the focus was on total costs to the customer, not just purchase price. By reducing warranty cost and repair time, we have reduced the customer's cost of ownership. Per Jerry Ramey: "We're achieving our meantime-between-failure objectives, in excess of 10,000 hours. With average usage, that means five years between failures. This is a significant improvement in reliability." Because of these improvements, Tek is offering a 3-year extended warranty on this product.

The Unicorn product has had an outstanding customer acceptance. By producing an outstanding product with high reliability for a price of only $3995, marketing has been able to turn on the orders. These outstanding results did not happen by chance. An outstanding design team was put together.

Dave Squire, GDP Business Unit Engineering Manager says, "From the beginning we knew that in order to have a competitive product we would have to do a lot of things differently. You know, we couldn't have service calls. We sat down before we started the project, and looked at everything that costs money in a product. From cradle to grave, what it costs to develop it. What does it cost to ship it? What does it cost to sell it? What does it cost to service it? What does it cost when we 'obsolete' it? We tried to minimize the cost of those things because we knew that just having the base manufacturing cost very low, we still couldn't enjoy the kind of margins we had before. So we had to make money in other ways, as in lower service cost and selling cost.

"So in light of that, if you don't want to have service calls, one thing you can do is not have anything go wrong with the instrument. So we came up with some objectives for quality, in terms of MTBF. We said we wanted greater than 10,000 hours. We also said that we didn't want to have any scrap and rework, which are traditional costs that get buried over the manufacture line." Designing for quality was a major consideration from the start. High goals were established for reliability, cost and manufacturability.

Reliability Engineers were involved from the beginning of the project. An early prediction was made to verify the 10,000-hour goal. Stress analysis of every component was considered and circuit designs were changed to keep electrical stresses within tight derating standards. Failures during Phase A engineering evaluation tests were carefully evaluated to improve the design. Twenty units were selected for Phase B evaluation tests and the 10,000-hour MTBF reliability goal was proven.

We discussed quality and reliability goals with key suppliers, and they became a part of the supplier's contract. The keyboard supplier, Key Tronics, agreed to a goal of 200 parts per million, which was considerably better than they had previously produced. They will probably not meet this tight goal until 1985. The monitor supplier, Panasonic, was making the usual Japanese claims of zero defects until we asked them to put a 1½ percent defective goal into the contract. At that point the true percentage became much clearer.

A total quality plan was developed which called for verification of quality at each step of the process. A new approach called ongoing reliability test, ORT, is used on this product. Six units are pulled from production each week and placed on 600 hours life test. In the second week of this test, failures were traced to a defective IC. A stock sweep removed 2000 of these components that would have gone to the field. Central purchasing had ordered these parts from an unapproved source. Considering the $200,000 estimated field costs that would have resulted, purchasing procedures have been changed to reduce the risk of this happening again.

This is not the only positive result from the ORT test. Many improvements are occurring due to failure feedback to engineering. ORT tracks this improvement. ORT results now show that the MTBF has improved for each quarter. The GDP team is not standing still. The Unicorn line that started with the 4105 is now also producing the 4107 and will shortly come out with the 4109.

Improvement in manufacturing processes is also occurring. An ELF's chamber will be temperature cycling the ECBs and thus remove the need for a 7-day burn-in on the completed assembly. ▣

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