CASE STUDY

Automotive Stereo Tuner Manufacturing Line

PROJECT SUMMARY

This simulation study allowed a major automotive electronics division to test the design of tuner assembly lines prior to purchasing new machinery. The primary goal was to determine whether the proposed system could meet the target production requirements.

SYSTEM DESCRIPTION

A stack of unpopulated printed circuit boards is brought to the line where the first machine de-stacks the boards. Upon entering the system, they are screened, printed with glue, populated with parts, and passed through an oven to set the glue. Next, conveyors carry the parts to sequential machines for additional assembly steps. Conveyors transport the board to an inverter-station that permits part population on the board at downstream stations. All remaining assembly parts are affixed to the board manually. The boards are then soldered, bar-coded, and cut into eight final product tuners. The product is loaded onto totes and taken to the Tuner Alignment and Wrap Shield Area for final adjustments

OPPORTUNITY

Due to the high cost of equipment as well as the long turnaround times incurred when ordering automated manufacturing machines for the facility, it was vital to know prior to implementation if the proposed design would meet production goals.

APPROACH

The main objective of this study was to determine the lowest cost methods necessary to meet production requirements while achieving the minimum manufacturing cycle. Key goals of this project were to:

- Determine if the target throughput of tuner boards was feasible utilizing two independent electronic assembly systems.
- Validate the system's throughput capacity under the supplied production schedules.
- Evaluate in-line buffer requirements to minimize work-in-process levels and maintain required throughput.

SOLUTION

A Witness model was developed of the two electronic assembly system designs. Using the model for design analysis, the project team discovered a potential over-capacity situation. The project team designed a model that added two inspection operators and a parallel process station (a duplicate station). The re-designed system was capable of meeting all production requirements. The second electronic assembly line, as well as one in-line buffer, was eliminated with no adverse effect on overall production.

The model can be continuously updated through an EXCEL spreadsheet that provides a user-friendly interface to mask model input.

BENEFIT

Recommendations following the study included the elimination of one entire electronic assembly system. As a result, capital expense could be reduced 25 - 50%, and 33 laborers could be reallocated to more productive areas of the plant.

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