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# SMT007 MAGAZINE

# Optimize Throughput: High-Mix, Low-Volume Manufacturing

## The Mannifest

**Feature Column by Emmalee Gagnon,** MANNCORP

For manufacturers who have high-mix, low-volume production, there are certain pieces of equipment that can help optimize your throughput potential. For an application with high-mix boards, the most important thing is to choose a pick-and-place machine that can support many feeders. If you are unsure of the number of feeder slots your production level requires, it is best to speak with an expert who will review your bill of materials (at no extra charge) to determine exact equipment requirements.

In general, our team recommends pick-and-place machines with 128 feeder ports or higher for high-mix production. This number of feeders (or higher, if needed) allows for optimized throughput potential. For example, one company was able to have all the feeders needed for six different products loaded onto a single pick-and-place machine, thanks to its 128 feeder ports. This allowed them to do very short runs and quickly change from job to job.

A high-quality batch oven can simulate a much larger oven while taking up a fraction of the space. Choose a model that is single phase, simulates up to five zones, and uses around 30 amps of power. A small, manual stencil printer will meet the needs of low-volume, high-mix applications without breaking the bank; just choose a printer able to accommodate a stencil up to 29" x 29" and that provides fine-pitch printing (down to 12 mil recommended).

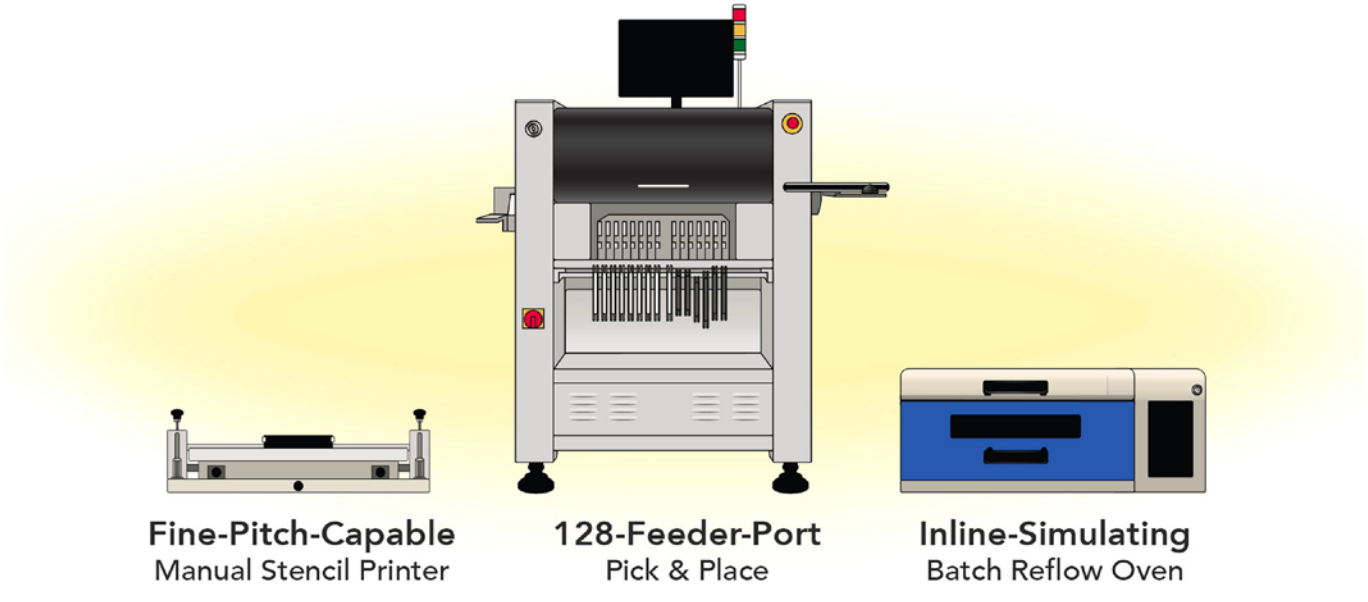



Figure 1: The high-mix, low-volume line provides partial automation for speeding up production while operating in a small space.

Figure 2: The Critter & Guitari high-mix production setup with a 160-feeder port pick-and-place machine.

To get an upgrade, choose a quality oven with inline ability. It will help improve speed and reduce the number of boards wasted during testing through features like predictive profiling software. To boost throughput even further, you can go with the two-head pick-and-place. Robert Keeley Electronics runs the two-head version of our 128-feeder-port machine, with great results for its on-demand-production guitar effect pedals.

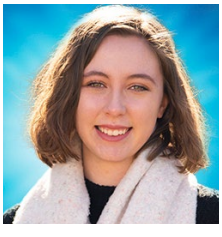
Another equipment line option for high-mix, low-volume is what music company Critter & Guitari is currently running. It has a standout pick-and-place option for high-mix applications since it can handle up to 160 feeder ports (96 feeder ports when used as inline). This allows their operators to have feeders for multiple jobs resident on the same machine, thus reducing changeover time.

When asked about their lineup, designer and founder of Critter & Guitari, Owen Osborn said, "This mix of equipment provides us with a small-footprint PCB assembly line. It really only took a few days to set up and it is easy to get up and running each day."

If inline ability is important to you, but you don't want to sacrifice feeder ports, you could go with a larger pick-and-place that allows for 250+ feeder ports when used as a batch machine, so it will still have 190+ ports available when operating with inline capability. Having this high number of feeder ports is a game changer for high-mix applications, and the ability to have conveyors can reduce the number of mishaps that can happen on boards during transport to the oven.

**Expert Tip:** Choosing a Smart feeder can help you get the most out of the feeders you use with your pick-and-place machine. Having a built-in screen for monitoring part quantities, feeder slot locations, part numbers, part values, and more—all while the machine is in-use or offline—can greatly improve throughput.

By choosing equipment that can help maximize your feeder capacity, you will be able to optimize your throughput ability. **SMT007**



**Emmalee Gagnon** writes about SMT-related topics and customer stories for Manncorp. To read past columns or contact Gagnon, click here.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