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ANAHEIM PRECISION MANUFACTURING

Article & Photos by Sean Buur



Joe Puccio COO of Anaheim Precision Manufacturing

VERTICAL INTEGRATION AND 5 AXIS MACHINING MAKE APM A ONE STOP SHOP

AnTHONY Puccio founded Anaheim Precision Manufacturing 35 years ago as a sheet metal and fabrication shop. Today, they are a fully integrated solutions manufacturer servicing high tech aerospace and commercial customers.

"My dad started the company and I started working here when I was around 7," half jokingly explains Joe Puccio COO of Anaheim Precision Manufacturing (APM). "I remember the first time I drove the forklift I was seven. After school or on school holidays I would be in the shop following my dad around just eating up as much as I could. I loved the machines and equipment as a kid, and I still love them now as COO." Joe ran the machines as soon as he was allowed to. As a young man his passion was machining, and he had a knack for it. Joe went off to college, but returned to APM right after graduation. "I came back from school and went to work in our sales department," tells Joe. "I moved into operations and worked my way through the system. I even wrote our MRP software because none of the off the shelf systems could handle all the things we do. That "can do" way of thinking is how we've grown the business over the years."

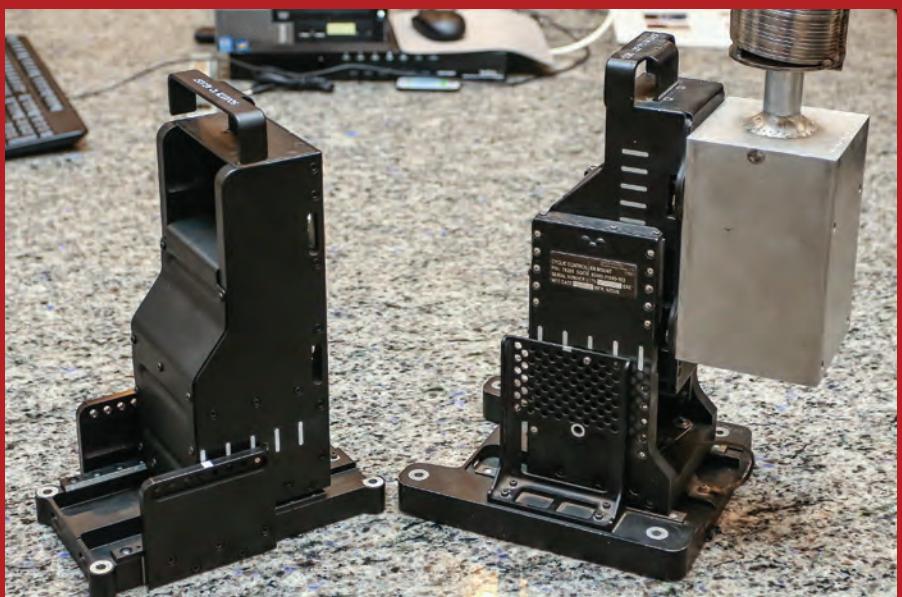
APM is a fully integrated manufacturing company, and they do it all. Their business cards read Anaheim Precision Manufacturing, but they also own Online Graphics and Finishing down the street and D Mills Grinding and Machining in Riverside, CA. In total they have six manufacturing locations with the corporate headquarters located in Orange, Ca. They do final assembly in the main building and have a single CNC used for fill-in work. Their sheet metal, machining and aerospace manufacturing center is just a couple buildings down from HQ and the paint facility is only a few blocks away. "We've become vertically integrated over the years," explains Joe. "Adding more and more capabilities to the company that we at one time outsourced. The more processes we can control, the better an impact we have on our lead time, cost and ability to meet the customer's demands." Online Graphics was their first acquisition back in 2001. "We negotiated a deal to buy the company with the stipulation that the owner stayed on so the tribal knowledge wasn't lost." They did the same kind of deal with D Mills Grinding. "Tribal knowledge is a valuable commodity in our business due to the specialized nature of what we do. Keeping that knowledge going and taking steps to make sure it is passed



Top - APM has many parts in the rotor and transmission assemblies of Sikorsky helicopters. This housing was a hog out from a titanium block.

Below left - Tanker fueling component that has a few different features welded together before APM does the final anodizing.

Below right - A lot of what APM does is pilot controls. They work with the pilots on a specific need and design for that. Here we have adjustable cyclic control mounts. They pretty much wanted a tilt steering wheel that could fit a large man or a small female pilot. They wanted a quick way to put it in place and fly off the deck. You squeeze the handle, put it where you want and let it go. They are now in their 6th version for different helicopters. The one on the right is an early prototype.



Above left - A helicopter rotor component machined out of titanium.

Above right - The G650 pedestal structure is (center console between pilot and co-pilot) a complex combination of sheet metal assemblies and machined parts all done inhouse at APM.



Fidel Solas runs the Kitamura 5 axis machining centers during the day shift. He was one of the original two operators trained on the new machines.

on is something we've worked hard to achieve." All 3 companies have a solid Quality System in place and are AS9100C and ISO 9001:2008 Certified and On Line Graphics is also NADCAP Certified.

"Manufacturing solutions" is the umbrella company Joe has in place to realize his vision for APM. "I see manufacturing solutions as us taking in a job via anything from a napkin sketch, to a full blown design. We take that design all the way through the development, prototype, qual-test documentation and completion and deliver a final product to the customer. Being a one stop shop is what we have been offering for quite some time." A growing portion of APM's business is design, development and manufacturing of their own products based on customer specs, but they also have a strong build to print division. "We do everything from major components for the transmission and rotor systems on Sikorsky helicopters down to small brackets for landing gear, and interior components like seat tables and seat trays." Because of their full service sheet metal fabrication, full service machining, full service turning and grinding, plus full service painting, powder coating, overlays and membranes you will find APM's parts everywhere on the aircraft. Customers range from military and non-military aerospace to non-military aerospace and commercial. "We are proud to partner with such amazing companies as: Sikorsky, Boeing, Raytheon, Parker, Honeywell, Hewlett Packard and AT&T."

APM eased their way into aerospace machining thanks in part to their existing sheet metal customers. "We had sheet metal aerospace jobs like pedestals for the G400 and G450," details Joe. "Really complicated assemblies that required us to outsource machine work. We ended up buying a couple Fadal machines to bring the machine work in house." Today company-wide they have two dozen CNC machining centers split between the six manufacturing facilities and had more than 5000-part change overs last year. "5000 times our machines went from one part to another," explains Joe. "So our focus over the last few years has been on ways to minimize setup times." APM has gone to zero point clamping, added 5 axis machining, and standardized their tool sets, all of these efforts focus on a reduction in setup times. "Setups are an arduous process that take a long time. Some take only an hour while others kill an entire day, but four hours is about average for complex change overs. Besides investing in machines and tooling to help the processes it has been about changing the company wide culture of how we go about attacking a job. We are aiming and succeeding at seeing that number closer to 15 minutes average across all 5000 part change overs." The addition of four 5-axis machining centers has been a big step forward for APM, allowing them to manufacture a part in a single op that was two, three or even four set-ups on a 3-axis machine.



Left - Tooling carousels of 60 and 100 tools were a selling point of the Kitamuras.
Right - The 5 axis machines can take a raw chunk of metal and do in one op what might have taken 2 or 3 ops on a 3 axis machine.

APM is primarily a Haas shop. They have machines big and small including two Haas 5-axis machining centers. They like that tooling is the interchangeable, programming is congruent and the platform is all the same. Recently they purchased two Kitamura Mytrunnion-4G 5-Axis machining centers from Machinery Sales and introduced a completely different element in the mix. "It was not an easy decision to add machines that differed from what we knew," explains Joe. "We needed different capabilities for jobs we already had and for future growth. The Haas machines are nice machines, but with some of our more critical items we needed something more robust. It is no reflection on them. We will continue to buy their machines and run the hell out of them, but we are making a part right now on the Kitamura that has 400 features with tolerances within 5 tenths across all the features. It has to be perfect and it has to be fast. Everything is getting tighter with regards to delivery and tolerance levels. Higher quality requirements and customer expectations are impacting us. We are working a lot with exotic hard materials such as titanium and the Kitamuras I feel offer a better platform to match that demand. For me, the Kitamuras represent the next level of manufacturing for APM."

Machinery Sales had two new Kitamura Mytrunnion-4G 5-Axis machining centers available and APM needed such capabilities for a job they already had won. "Peter Clayfield presented us with 2 fantastic machines with an attractive deal and we jumped on it," tells Joe. They ordered both machining centers at the same time but staggered delivery to give them a little time to learn the new systems. The programming is different, the code is different, the post is different and the trunnion tables are opposite to what they we are used to. APM dedicat-

ed two guys to the initial training, one from day shift and one from night shift. Later those two would cross train the remaining staff as needed. "Kitamura has been great with the training," praises Joe. "They are vested in the success of the machine and that is very important to us." Joe learned a long time ago the value of service and support and both Machinery Sales and Kitamura have exceeded his expectations so far. "Support has been incredible. We crashed the machines when we first got them and they were quick to help find a solution and get us back up and running. I think the parts we are manufacturing even impresses the Kitamura guys with the number of features and the precision we achieve."

The pair of Mytrunnion-4G 5-Axis machining centers came to APM as brand new works of art. The second machine has been up and running for the last six months and given Joe and his team plenty of time to appreciate some of the advanced options and nuances. The Kitamura machining centers are identical with the exception of tooling capacity. One machine came with a 60-tool carousel and the second boasts a 100-tool capacity. "The first two jobs we put on the Kitamuras used every tool available," details Joe. "Prior to the Kitamuras our largest tool capacity was 42 tools. Having 100 tools is a big deal and allows for a lot of added flexibility. On our 42 tool machines we would stage tools and load new ones in as needed, adding unnecessary interaction with the operator." Each Kitamura has 40mm high speed 15,000 RPM spindles and impressive computing power. "With more and faster memory these machines just eat up the code and never miss a beat," explains Joe. "All our posts have high speed machine capabilities and now we are able to capitalize on it. The finish right off the machine is flawless and the



Top left - Anaheim Precision started out as a sheet metal and fabrication shop. They still do extensive sheet metal work as part of their one stop shop customer service plan.

Top right - APM has machines ranging from simple to complex 5 axis machining centers.

Bottom - APM process improvements include zero point clamping systems and fully customizable mounting solutions.

repeatability is mind blowing. I'm really impressed." APM's day shift operator Fidel Solas also adds how he likes having a large work envelope with easy door access and 24 inches of travel in X and Y and nearly 20" in Z.

With turn-key manufacturing solutions for their customers, Joe is convinced that Anaheim Precision Manufacturing is in a position to double their sales in 2017. "We have a nice combination of machines, employees and a great base of LTA work," details Joe. "With 118 people on staff spread between the different locations it is a manageable number. One quarter of our current business is sustainable programs and that number is growing."

We have our designs, and our products on programs that are ramping up production. APM products are on everything from the new presidential helicopter to the 787. These demands will continue to grow as will the LTA programs for the A350, 777 and 737." Joe's goal is to have every spindle turning 24/7 and they are well on their way to making that happen. "Quality and customer service have always driven our success," concludes Joe. "My dad instilled that in me early on and every day APM works with that in mind."