

ISSUE 10 - AUG 2022

QUARTERLY NEWSLETTER FROM AUTOMATED SOLUTIONS AUSTRALIA

A X I S

PARTNERSHIP
ANNOUNCED

ROBOT IN FOCUS
FANUC M-710 SERIES

AW FRASER



FROM THE **DIRECTOR'S DESK**



It's been an action packed few months for us.

In June, we were exhibitors at AMTIL's Australian Manufacturing Week (AMW) in Sydney, which is always a great experience, feeding off the excitement and enthusiasm of Australian manufacturers, who are keen to get in and around the latest technology. It is also an exciting time as we get the opportunity to introduce future generations of Science, Technology, Engineering and Maths (STEM) students to automation, as they make their way through the exhibition halls. AMW is truly one of those events that really fills your cup, and the inaugural Sydney event was no exception. To celebrate our growing manufacturing network, one lucky visitor to AMTIL walked away with a fantastic bottle of South Australia's finest, Penfold's Grange, while a second visitor will be taking some professional PGA golfing lessons on us.

In July, we quietly ticked over the twenty-year milestone, which is humbling, and makes you reflect on the path travelled to get us where we are today. It has certainly been an amazing journey thus far, and I'm very excited to share with you the new partnerships we continue to forge. This includes our most recent announcement of a partnership for hypersonic coating technology with Aerobotix, based out of Alabama in the USA. Aerobotix is a world leader in automation within the aerospace and defence sector, and we talk about this partnership, what it means for Automated Solutions Australia, sovereign manufacturing capability in Australia, and the broader defence sector, in this newsletter.

In each edition of Axis, I challenge our editorial group to provide you with interesting and informative articles. This month, we feature one of ASA's innovative clients, AW Fraser out of New Zealand, who feature a foundry, extrusion plant and machine shop all under one roof.

We move the technology spotlight onto the FANUC M710i series of robots, whose innovative and lightweight design make them ideal for handling applications involving medium payloads and a reach of up to 3.1 m.

We also interview Peter Appleby, one of our Automation Engineers, as we recognize our most important point of differentiation - our people. Peter has worked with us across Canada and the USA, as we ask him what his typical day with the company looks like.

We trust you will enjoy this edition of Axis, which we will share across social media platforms. If you have not already, be sure to follow us on Facebook, Instagram and LinkedIn for even more informative articles, plus the latest industry news. We always welcome your feedback as we strive to be your integrator of choice.

I hope that by sharing some of these articles and experiences, we can inspire you into your next automation project. On behalf of the team at ASA, we thank you for choosing to partner with us and look forward to keeping you updated on the latest advancements in automation, while servicing your needs, now and into the future.

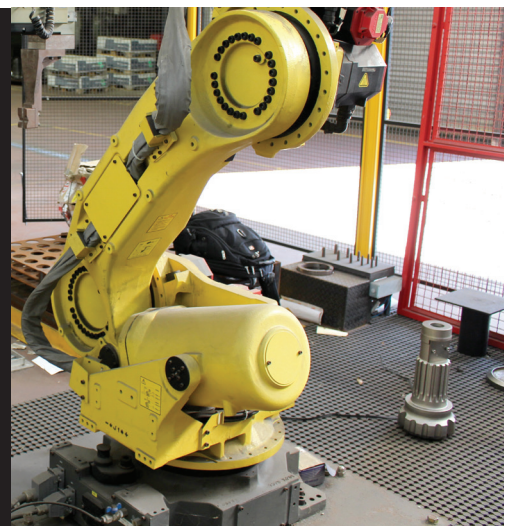
Pat Green, Director

ANNUAL ROBOT SERVICING

Has your Robot had it's Annual Service?

Call ASA on 1800 ROBOTS to book.

Just like a car needs regular servicing, the same applies to your robots. Your robots work hard for your business, sometimes operating 24 hours a day for long periods, so annual servicing of your robots will ensure your FANUC robots remain in optimal condition. Greasing, battery replacements, checking for excessive wear and measuring back lash ensure motion repeatability, as well as continuing to provide you with a great consistent outcome for your manufacturing processes. Annual servicing helps maintain a high level of Mean Time Between Failures (MTBF), as well as potentially forecasting issues that may be developing.



PARTNERSHIP ANNOUNCED



Aerobotix and Automated Solutions Australia Announce Partnership to Deploy Robotic Systems for Hypersonic Coating Applications. Robotic integrators on opposite sides of the world team up to solve Hypersonic engineering challenges.

HUNTSVILLE, Ala., June 22, 2022 – Aerobotix and Automated Solutions Australia (ASA) today officially announced a robotic automation international partnership between the two companies for the development and testing of hypersonic capable parts. The partnership follows the 2021 signing of the AUKUS security pact between the U.S., U.K. and Australian Governments, which includes provisions for the allies to work together on hypersonic and counter-hypersonic capabilities.

The Aerobotix-ASA collaboration will enable the Australian defense sector and Australian defense contractors to more easily access both companies' expertise in automation. The two companies became acquainted through their mutual capabilities in the robotic

coating automation industry and are now working together to pursue projects for which a sovereign presence is required.

"We'll work with the U.S. State Department for approval of any technology transfer for ASA," said Josh Tuttle, Aerobotix Business Development Manager. "We'll also help ASA in other ways. For example, we can save them years of costly development work by sharing how to robotically spray FIREX™ RX-2390 Thermal Protection System coatings."

Aerobotix and ASA are both turn-key robotic integration companies with specialized capabilities in the precise application of paints and performance coatings. Aerobotix has accumulated invaluable experience in the use of robotics to scan, sand, measure and paint hypersonic articles on multiple

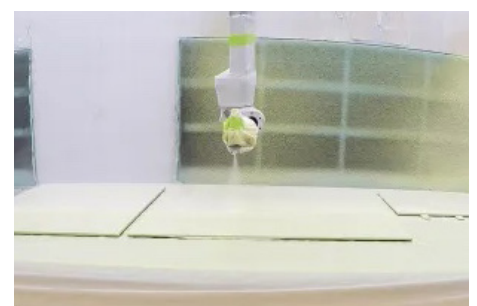
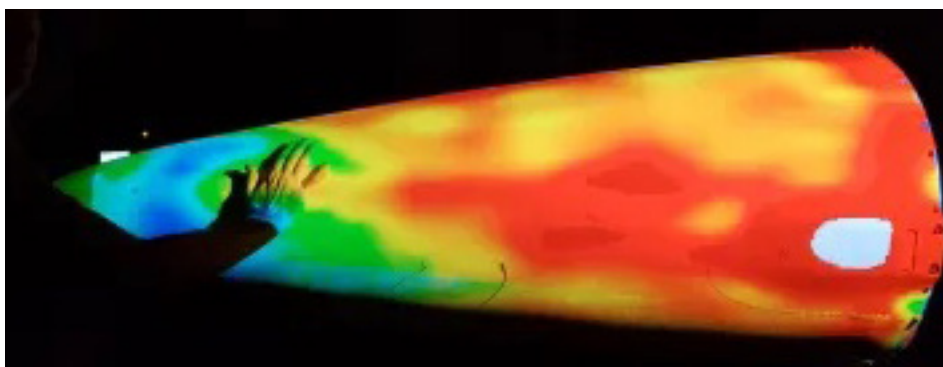
programs. ASA's relationship with FANUC has resulted in the installation of more than 100 FANUC painting robots in Australia. Now, with the backing of Aerobotix, ASA has the expertise and technical capability to overcome the most difficult automation challenges in precision coating applications.

"Aerobotix has already deployed several production robotic systems for hypersonics," said Nathan Jones, ASA General Manager. "They're even making critical test parts for programs that haven't had time to build production facilities. Their willingness to support our company, and Australia, is going to significantly reduce costs, schedule delays and program risk."

With 20 years of robotic coating automation experience in Australia, ASA is uniquely positioned to provide sovereign capability and assist in the rapid development of hypersonic capability on Australian shores.

About Aerobotix

Headquartered in Huntsville, Alabama, Aerobotix is an innovative leader in advanced metrology and robotic solutions



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Nathan Jones, ASA General Manager

for the aerospace and defense industries. The company specializes in the creation of cutting-edge automated robotic and measuring solutions for high-value, high-precision components, aircraft and vehicles. Aerobotix has more than 130 robotic systems installed in the U.S. and abroad, providing exceptional results and savings for our clients.

About Automated Solutions Australia (ASA)

Automated Solutions Australia (ASA) enables our clients to compete on the world stage

by bringing world class, flexible robotic automation to Australian shores. Celebrating its 20th year in operation, ASA's team of highly skilled engineers are solving our clients' needs on a daily basis, delivering tomorrow's solutions, today. We provide innovative and novel automation solutions using Fanuc Industrial Robots in the Australian Defence, Aerospace, Automotive, Pharmaceutical and Manufacturing industries. With offices in Adelaide and Melbourne, ASA is committed to seeing our clients' success all across the country and beyond.

ROBOT IN FOCUS - FANUC M-710 Series Robots

Medium Payload, Lightweight, and Suitable for Many Applications












The FANUC M-710 series of robots has been designed around medium payload applications, with excellent load capacity, high rigidity, and moment of inertia. These robots provide a very high degree of accuracy, providing unrivalled efficiency at extremely high speeds. For this reason, they offer maximum versatility and reliability across a wide variety of applications.

The 11 robots that make up the FANUC M-710 series offer maximum payloads of up to 12, through to 70 kg, and a reach of up to 3.1 metres, depending on the chosen configuration. They include a slim wrist, robust arm, and a compact footprint, weighing an average 560 kg. The high axis speeds of this series make it very fast, coupled with its high mechanical rigidity, which makes it extremely accurate. This inherent design makes the FANUC M-710 series a highly favourable choice, and capable of servicing a number of industry sectors.

The Expert in Harsh Environments

The FANUC M-710 series of robots provide consistent accuracy and unmatched performance. They are designed for exceptionally high speed, maximum flexibility, and dependability across a vast array of applications. When coupled with the FANUC FoundryPro or SE options, these machines are completely IP67 protected, making them perfect for use in harsh locations. In addition, this industrial robot's capacity to reach above and behind gives it one of the biggest work envelopes in its category.

With as few mechanical components as possible, the FANUC M-710 Series Robots has been intended to maximise mean periods between failures and minimise the need for replacement parts.

 M-710iC/12L 6 axis robot, low payload, long arm version <ul style="list-style-type: none">• Axes: 6• Payload: 12 kg• Reach: 3123 mm	 M-710iC/20L 6 axis robot, long arm version <ul style="list-style-type: none">• Axes: 6• Payload: 20 kg• Reach: 3110 mm	 M-710iC/20M 6 axis robot <ul style="list-style-type: none">• Axes: 6• Payload: 20 kg• Reach: 2582 mm
 M-710iC/45M 6 axis robot <ul style="list-style-type: none">• Axes: 6• Payload: 45 kg• Reach: 2606 mm	 M-710iC/50 6 axis robot, standard version <ul style="list-style-type: none">• Axes: 6• Payload: 50 kg• Reach: 2050 mm	 M-710iC/50E 6 axis robot, offset wrist version <ul style="list-style-type: none">• Axes: 6• Payload: 50 kg• Reach: 2050 mm
 M-710iC/50H 5 axis robot, packing/palletizing version <ul style="list-style-type: none">• Axes: 5• Payload: 50 kg• Reach: 2003 mm	 M-710iC/50S 6 axis robot, short arm version <ul style="list-style-type: none">• Axes: 6• Payload: 50 kg• Reach: 1359 mm	 M-710iC/50T 6 axis robot, top mount version <ul style="list-style-type: none">• Axes: 6• Payload: 50 kg• Reach: 1900 mm
 M-710iC/70 6 axis robot, standard version <ul style="list-style-type: none">• Axes: 6• Payload: 70 kg• Reach: 2050 mm	 M-710iC/70T 6 axis robot, top mount version <ul style="list-style-type: none">• Axes: 6• Payload: 70 kg• Reach: 1900 mm	

Robot Force Sensing Options

When fitted with the FANUC force sensing option, the FANUC M-710 series are suited for force applications such as polishing and deburring, because of its high inherent mechanical stiffness of the unit. The thin arm and wrist components of the FANUC M-710 reduce interference with system peripherals, enabling operation in confined work envelopes. The J3 axis offers integrated pneumatic and electrical services, with up to 8 inputs and 8 outputs, as well as PROFIBUS, providing easy integration into the end-of-arm tooling.

The FANUC M-710 series of robots may be installed on the ceiling, or on an incline, allowing for better access, a larger work envelope, and maximum flexibility.

Conclusion

Whether you are a large or small manufacturer, if you think the FANUC M-710 series of robots might be the right fit for automating your manufacturing process, we invite you to connect with us.



AW FRASER

On any given day in Christchurch, New Zealand, you'll find old car radiators, tangled electrical wire, taps from yester-year, and other trinkets, slowly bubbling away inside a furnace at temperatures around 1500 degrees Celsius. Once these items are reduced to a molten form, they are converted into forty types of specialised bronze and brass alloys, which can then be transformed by on-site machining processes into precision components such as valves, engine parts, gears and even bushes and other critical components within wind turbines. Such is a day in the life of AW Fraser.

Since the 1930's, AW Fraser have been offering an end-to-end solution for high grade metal components. Since then, the company has become a global leader in supplying bronze and brass components to over thirty-five countries globally.

With a foundry, extrusion plant and machine shop all located on one site in Middleton, AW Fraser can leverage their unique competitive advantage and have full control of quality from start to finish. Reprocessing of any remnants, chips or swarf on site means everything is recycled or reused and allows very competitive pricing for machined blanks or machined parts.

Metal comes to AW Fraser and is sent to the scrap bay, where it is sorted, graded, and turned into a form the foundry can use, referred to as a charge. Each charge is issued per alloy of what AW Fraser are trying to make. Products are cast into horizontal castings, vertical castings and centrifugal castings, where they are then cut efficiently and to the highest quality standard. Once the bar has been cast, it will head off to the machine shop or external customers to make final machined components out of the cast metal. If the raw stock reaches the onsite machine shop, the CNC machines turn the raw material into precision machined

products that are then measured by CMM to ensure the most stringent tolerances and quality targets are met.

Recently, AW Fraser invested in three automation cells with Automated Solutions Australia (ASA). Jody Tuckwell, Operations Manager from AW Fraser reflects that in working together with ASA, 'From conception through to commissioning, this project was never a transaction, it was a collaboration. Both parties came to the table with the utmost respect for each other's skills and experience and as a result the outcome has been phenomenal.'

The first two cells are tending two of AW Fraser's recently installed multitasking turn and mill machines, a DMG Mori NTX 3000 and an NTX 2500. ASA coupled each of these machines with a Fanuc R2000iC/270F, increasing throughput significantly by tending to the machine around the clock to unload machined parts and reload raw stock as soon as the machine is ready.

ASA designed each cell with a floor mounted robot and five infeed bays, designed to

Continued next page

receive AW Fraser's ingenious parts trollies and work pallets. The work pallets are designed to glide on a cushion of air from the trolley onto the CMM, allowing a 150kg bush to be taken from machining, through inspection and onto packaging without having to sling, lift or slide it.

Each robot can access multiple grippers to load and unload parts from the machine, automatically performing gripper changes between the load and unload if required. The more common grippers are duplicated in each cell, but the specialised, extremely heavy grippers are able to be moved between the cells as required.

The third cell is nearly a duplicate of the second cell with their third Fanuc R2000iC/270F tender yet another DMG Mori NTX 2500. The proven trolley and pallet configuration is being employed again as is the flexible gripper configuration, however the available workshop space dictates a slightly different layout and access to the previous two cells.

"With all the time we have saved with automation, our operators are now able to focus more of their attention on the product's overall quality, something in which they take a great deal of pride."

Each cell was designed by ASA after close consultation with AW Fraser to understand the existing pain points and desired outcomes from this investment. Each Fanuc robot cell is equipped with Automated Solutions' CNC Toolroom software. The software allows the machine tending sequence to operate in a number of ways, each selectable to suit the part being machined. 'To eliminate the risk of operator error, the ASA team encapsulated everything into a fully customised touch screen and simplified the PLC system,' said Tuckwell.

For a conventional machining process with raw part in, finished part out, the robot picks the raw bronze billets up from a work pallet and loads them into either the main spindle or the sub spindle of the machine depending on the loading operation that has been setup for the part. When the machining cycle has finished, the robot then unloads the machined part from either the main spindle or the sub spindle and places this finished part back onto the infeed trolley. Most jobs



operate this way with twin spindle machines. AW Fraser also have parts that use the raw part in, multiple finished parts out machining process. In this method, the robot loads the raw billet into the main spindle and progressively unloads 9 finished parts from the sub spindle before finally unloading the remnant piece left over from the machining process. After unloading the remnant and placing it adjacent to the 9 finished pieces, the robot loads the next raw billet and repeats the process. Tuckwell remembers the first day of operation fondly 'When we were originally conceptualising the project, I dreamt about the day we might one day run twenty-four hours straight. Then, when that happened and we continued running unmanned for 48hours uninterrupted, it was the stuff dreams are made of.'

Through close collaboration from the initial design stage to implementation of the automation, AW Fraser and ASA have managed to reduce cycle time and offer greater overall productivity, along with improvements in safety and flexibility.

Tuckwell says 'Because of the time we have saved with automating our processes, our machinists are enthusiastically upskilling through robust training regimes. With all the time we have saved with automation, our operators are now able to focus more of their attention on the product's overall quality, something in which they take a great deal of pride.'

From start to finish, this fascinating process offers a brief insight into a full circle recycling process; following scrap metal through the furnace, into the foundry and extrusion plant, before being turned into high quality precision components in the machine shop. Perhaps equally as fascinating is the unique position AW Fraser finds themselves in, having been in business so long and now seeing components they've already recycled, return years later to be recycled again, a truly sustainable manufacturing process.

**<https://m.youtube.com/c/AWFraserLTD/>
featured**

MEET THE **ASA TEAM** - PETER APPLEBY

What has been my favourite robot to work with?

If you were to ask me what robot I am most familiar with, it would definitely be the FANUC P700iB painter robot. Having worked with these in combination with the R30iB controllers on several projects, I feel very comfortable with them. That said, I'm someone who enjoys a challenge and I'm also a bit of a nerd for big robots, so while I haven't done a lot with them, the swing arm FANUC P250s featuring additional axes used for processing the inside of big vans would definitely rate up there as one of my favourites. On a project I was a part of, we had these swing arm units mounted in the sealer cell on the end of two big custom arms. These two arms swung the whole robot into the cell for processing, and then out of the way of the units indexing out of the booth when they were finished. When processing, they would have to reach all the way in from the rear opening of the van up to the front firewall area to seal the seams. From there, they would work backwards towards the rear of the unit, processing all the interior seams on the way back out. Seeing such a big robot (3m of full reach from its base on the additional axes) reach all the way in and twist itself around inside the unit to reach all the seams, was really cool.

Most interesting project?

The most interesting project for me, and where I learnt the most, was working on the brownfield start-up in Ontario, Canada as an Installation Engineer, and then evolving into a Process Engineer. I really enjoyed learning how all the various systems in a robotic paint booth work and are installed, and I really enjoyed working with Dave Roulston who has a real wealth of knowledge and experience. I found it interesting to see it all come together, initially from an empty bay of the plant to a fully operational paint booth running production. This experience gave me a great insight into how system integration works, and how all the various system components interact, which has been invaluable as a tool when trouble shooting as an Installation Engineer or Process Engineer. Moving ahead, I am looking forward to the opportunity to developing similar insights from a controls perspective.

What's been the biggest challenge I've had to overcome on a project?

There was a particular modular build of a cell that was a tough one, primarily from the aggressive deadlines imposed on getting the cell launched and brought off, before it had to be taken apart and shipped to site. It meant that we were working two shifts, and I was partnered with Brendan Howe, one of my ASA colleagues, on nights. It was my first exposure working with pedestal robots, and my first time working with the new R30iB+ controllers and all the associated software updates and features, so there was a steep learning curve. We put in some long shifts, but in the end, we got through the Mod Build ahead of schedule, and shipped the cells off the factory floor with no outstanding issues, so it ended up being a great achievement and a good learning experience for us both.

What has been your biggest achievement with ASA to date?

My biggest personal achievement certainly wasn't my biggest project, but more so one where I had to overcome some big hurdles. I was earmarked for a certain area of sealer dispensing project, which at the time I had not worked with before. Due to COVID, resources were significantly impacted, and the result was I went from being part of a team, to working autonomously on equipment I wasn't familiar with. I had previously limited exposure to the sealer robots and the associated vision systems, so it meant taking the initiative, and learning how to get the system operational, and properly calibrated. I successfully navigated this, and by the time additional resources arrived, I had almost all of the systems set up and calibrated properly, and I had correctly identified several installation issues and worked with the site team to resolve them. Over the course of the six weeks, I became proficient in the sealer systems and sealer process work, so much so that in the last couple of weeks of production support, I was tasked with introducing a new recruit with the systems and to FANUC robots in general. The site team and larger collectively group working on the project did a great job, and in the end we left site two weeks ahead of schedule because the customer was satisfied that there were no outstanding issues and we were no longer required, which is a great outcome for everyone.



What does a typical day look like for you, and what are you currently working on?

I'm currently working on a greenfield paint shop installation, where we are installing a total of 78 robots across 5 lines and a total of 13 cells. My day typically starts at 5 am, shower, dress, pack breakfast and make myself a coffee. Call me fussy, but I can't stand American "coffee", so I make my own. I meet the team around 5:40 am, and we head to the plant for a 6:00 am start. We'll get set up, go through our Job Safety Analysis (JSA) and Work Method Statement (WMS) for the activities of the day, before a 7:00 am site meeting, where ourselves and other contractors will discuss activities that are going to interact with others on any given day. At 8:00 am, we have a specific process meeting with the customer, which occupies a good part of our morning. At around 11:30 am, we break for lunch, before heading back in to continue work. Typically, when we are working onsite, it is closer to a 10 hour day, and we finish around 4:00 pm. With the heat and humidity, we are currently working in, my first destination is the shower, followed a close second to the hotel gym. I eat relatively early, around 6:00 pm, and I always try to be in bed by 9:00 pm to get a good 8 hours of sleep before doing it all over again the next day.

What do you enjoy most about working at ASA?

The people. ASA has a really great group of engineers who are all friendly, hardworking, highly skilled, and professional. I find it really stands out being part of that group and knowing that on site, we have that reputation to uphold. It feels great to be a part of that, and it pushes me to maintain that reputation.

DELIVERING TOMORROW'S SOLUTIONS, **TODAY**

ASA is a privately owned, wholly Australian company specialising in the design, engineering and integration of flexible automation solutions for the Australian manufacturing sector.



Whether your application is pick and place, palletising, packaging, part transfer or assembly, the development of a robotic solution offers significant benefits in almost any industry that is operating at high levels of throughput.

- Achieve uninterrupted speed, saving valuable production time.
- Achieve maximum repeatability, reliability and accuracy
- Lower costs versus manual labour
- Eliminate health and safety risks related to repetitive, tiring or dangerous operations

Contact ASA for more information or visit our website
automatedsolutions.com.au

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