

## Media Release

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### **'Please stop telling us it's impossible' – an official EU Report now unequivocally verifies Locata's 'Alternative-to-GPS' technology performance**

- ▶ A new European Commission (EC) Technical Report has officially validated the previously inconceivable levels of performance which were claimed by Locata Corporation's new technology. The Report documents cm-level positioning accuracy hundreds of times better than any other tested technology.
- ▶ Locata's deep-tech TimeLoc™ inventions promise to deliver completely new positioning and timing capabilities for many applications, including autonomous vehicles, logistics, indoor positioning, critical national infrastructure sites, and importantly – improve the performance of mobile phone and digital data systems.
- ▶ Locata installed their terrestrial 'Alternative GPS' networks across wide areas of Northern Italy, demonstrating centimetre-level positioning and picosecond timing (thousandths of a billionth of a second) for the independent tests run by expert EC engineers.
- ▶ Locata is the inventor and sole supplier of this step-change technology, which has been granted over 150 patents to date. Their innovations could enable new business and product developments potentially worth tens of billions of dollars.

Locata Corporation has effectively changed the game for Global Positioning System (GPS) and Global Navigation Satellite Systems (GNSS) applications.

Locata's ground-breaking technology has now been tested, and its performance claims confirmed, in rigorous, independent scientific trials conducted in Northern Italy by the European Commission's (EC) Directorate-General for Defence Industry and Space (DEFIS).

The DEFIS test report has just been published by engineers based at the EC's Joint Research Centre (JRC). It confirms that Locata's ground-based networks can provide non-GPS-based centimetre-level positioning accuracy in areas where GPS does not work, including indoors.

Even more impressively for many hi-tech engineers, Locata proved they are able to synchronise time consistently, across the large areas covered by their radio-based systems, to picosecond levels (sub-billionth of a second), without using atomic clocks.

“These results, we believe, are completely unprecedented – and a game-changer for the entire industry,” said Mr Nunzio Gambale, co-founder and CEO of Locata. “I am immensely proud of the Locata team that’s remained laser-focussed on delivering this amazing technology to the world for well over 20 years. None of this just happened by accident.

“Locata’s proprietary TimeLoc™ technology produces unprecedented over-the-air picosecond-level synchronisation performance which leaves even experts shaking their heads in disbelief,” Mr Gambale continued.

“Nevertheless, these meticulous EU tests have now clearly proven Locata’s TimeLoc™ invention does synchronize radio transmitters, over a hundred kilometres apart, to around 150 picoseconds. For anyone grappling to comprehend the time scales involved, I tell them that one picosecond is to one second as one second is to 31,700 years. That’s why TimeLoc™ sounds ‘unbelievable’.

“It’s exciting to see all our breakthroughs now verified beyond question by the experts that produced this seminal European report. This level of validation puts a spring in our step that no amount of money could buy. It makes our decades of effort feel worthwhile, yet there’s a lot more still to come from this superb team,” Mr Gambale said.

“Our demonstrated levels of high accuracy position and time are obviously not impossible,” said Mr David Small, co-founder, inventor and Chief Innovation Officer of Locata.

“We didn’t attempt to break any laws of physics while developing TimeLoc™. We just leveraged the fact that our high accuracy positioning requires high accuracy timing, so the two requirements fit very naturally together.”

To an expert in the GPS field this world-first innovation seems, on the face of it, an implausible concept. Atomic clocks have always been the foundation of GPS positioning systems – as essential as wheels are to a car.

“When I first saw these European test results my initial reaction was ‘No. This does not seem possible’,” said Professor Hugh Bradlow, former CTO and Head of Innovation for Telstra and a globally-respected engineer with a PhD in Experimental Nuclear Physics from Oxford University.

“These picosecond levels of over-the-air synchronisation do not seem feasible if you don’t use the atomic clocks which have always been at the heart of GPS and digital networks. But, as Carl Sagan said: ‘Extraordinary claims require extraordinary proof’.

“The EC Report now provides that proof. I believe the future scientific and business implications of this technical validation are stunning.

“It’s also important to understand that Locata is not just about positioning. They have demonstrated new technology which can improve the efficiency of mobile and digital data networks by increasing data throughput through the provision of better time synchronisation performance,” Professor Bradlow said.

The need for a ‘backup to GPS’ has become a challenging but growing global necessity. Many respected government-funded studies have highlighted that even a short-term loss of GPS services will cause billions of dollars per day in economic losses, and create serious disruptions in almost every sector of a nation’s economy.

“Locata has developed a breakthrough positioning and timing technology that no other company, academic research group or government agency, anywhere in the world has been able to achieve – despite numerous efforts over the past few decades,” said Dr Chris Rizos Emeritus Professor at the University of New South Wales in the fields of Geodesy, Surveying and Navigation.

“It is a positioning and timing system that matches the capabilities of GPS in unique ways. Locata is a GPS-alternative that can answer the question: ‘When GPS fails or is unavailable, what could you use in its place’?

“Addressing this problem is critical if a nation, or even an industry sector, wants to have assured access to positioning and timing services, at all times. With every escalation of geopolitical instability around the world, the positioning and timing services provided by GPS and GNSS become more vulnerable to disruption.

“Furthermore, Locata can provide incredibly accurate position and timing data in the many urban areas and indoor spaces where users cannot reliably receive the signals from space-based GNSS.

“Locata’s technology is therefore unique in not only offering significant positioning and timing performance improvements to all users, in all environments, but is doing so via a terrestrial technology that overcomes the single-point-of-failure vulnerability that GPS/GNSS represents for every nation,” Dr Rizos said.

“Locata is a positioning and timing system that can be under the complete sovereign control of a single nation or jurisdiction, something that should be valued by the government of any nation.”

Locata’s business model today is fundamentally similar to that of ‘Intel Inside’, where they licence their technology to global partners who then utilise it within their own products and applications. Locata’s intellectual property developments have already been granted over 150 patents internationally, with many more in the pipeline.

Locata’s integration partners can access this IP portfolio, and gain a new toolbox of enabling capabilities which improve the performance of their systems – especially within industrial automation markets where the company has gained its early adopter customers.

The company's technology is today being used in multiple commercial and military applications around the world. In fact, the accuracy, reliability and control delivered by Locata technology has allowed partners to receive, for the first time, safety-of-life-level certification for radio-based navigation of fully-autonomous industrial machines.

Locata's products have been deployed commercially for a decade, delivering cm-level positioning (via sales and IP licenses) to globally recognized partners, including systems now certified for safety-of-life level operation of autonomous vehicles. Prominent government customers include [NASA](#), and [the USAF, which runs a large world-first Locata network that covers over 6,500 sq. km](#) for aviation use when GPS is being jammed

"What Dave Small and our team has achieved is extremely hard to do. It means that we've arrived at this juncture without having any credible, direct competitors," said Mr Gambale.

"In fact, the DEFIS project tender was advertised around the world, seeking applications from every potential candidate selling or developing 'GPS timing and positioning backup technology'. Over 30 companies applied, and this number was then down-selected by an expert panel to the seven technologies that were finally independently evaluated."

Locata was the only technology that completed every required timing and positioning test, in every indoor and outdoor environment. The technology performance Tables in the DEFIS Report 'Test Campaign Conclusions Section' clearly show that Locata's performance was generally orders-of-magnitude better than any other published result.

"For example, in the positioning tests most other technologies gave 'position solutions' varying between 7.1 and 15 metres. Locata's measured performance for those test scenarios was between 6 and 17 millimetres," Mr Gambale said.

"No other tested technology could deliver a position solution indoors, whereas Locata's indoor positioning is reported as 11 millimetres. No other technology tested by the EU came close to Locata's outdoor and indoor timing performance, either. Frankly there's nothing more we need to prove. The results in the EC report should speak for themselves.

"Our next big step is to miniaturise Locata technology down to a chipset. That process has commenced, and we have prototypes already running in our R&D labs today. These advanced devices will eventually allow Locata partners to embed our unparalleled performance into all manner of consumer devices, including mobile phones," Mr Gambale said.

According to the European Commission's DEFIS Technical Report, during multiple independent tests run over a period of three months, Locata demonstrated:

- ▶ Radio-based picosecond-level time transfer outdoors, indoors and through non-line-of-sight obstructions like brick walls, as well as picosecond-level time transfer over fibreoptic or coaxial cables;
- ▶ Nanosecond synchronisation accuracy to an EU-supplied UTC reference time source;
- ▶ Indoor and outdoor positioning at the cm-level, using Locata's high-precision survey-grade carrier-phase solutions. These particular demonstrations included both hardware and software-based multipath mitigation capabilities;
- ▶ The average Locata indoor positioning performance was 8 mm static and 5 mm moving;
- ▶ The average Locata outdoor positioning performance was 11 mm static and 10 mm RMS while moving; and,
- ▶ Reliability and resilience of the Locata network, matching safety-of-life level certification requirements.

The full DEFIS A-PNT Report (the Summary of all the tests) is on the EC's official website, here:

<https://bit.ly/3K905ib>

The full, 141-page Technical Report specifically covering all Locata technology tests (Appendix 7 of the JRC's EC Report above) is also on that website, and available for download here: <https://bit.ly/40iC11V>

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## **About Locata**

Locata Corporation is a privately-owned Australian company that has invented new radio-location technology that gives precise positioning and time synchronisation in the many environments where GPS is ineffective.

Locata's patented technology can provide independent GPS-style performance, in its' network coverage area, without using atomic clocks or satellites.

Locata has the unique ability to replicate a GPS satellite constellation locally, on the ground. This allows entities such as mines, ports, construction sites, warehouses, airports, critical national infrastructure sites, cities and more to determine the reliability and accuracy of positioning they wish to deploy under their own sovereign control, and with complete local autonomy.

Early adopters of Locata technology include mining, ports, military, aviation, warehousing and logistics markets.

## About GPS/GNSS

GPS was designed in the 1970's to deliver position, navigation and timing information to military users in open sky environments. It produces signals from a global constellation of satellites, each one equipped with at least three atomic clocks.

The original 1970's GPS engineering team could never have imagined a world of mobile phones working indoors and outdoors, personal computers, flat screen TV's and emerging fully-autonomous cars. Each of those modern applications, and many others, now struggle to deliver acceptable next-gen positioning performance – especially in built-up urban areas and indoors where people spend the majority of their time.

The satellite-based systems are now also proving to be a headache for military users. As demonstrated every day in places like the Ukraine and Syria, it is simple for adversaries to jam or 'spoof' the signals received from space.

Those military applications are well-known and often reported by mainstream media. The reality, however, is that today over 95% of all applications for GPS/GNSS are civilian, rather than military. Every nation and their digital economies now depend on GNSS-based signals for positioning and timing applications. It underpins markets as diverse as transport, banking, telecommunications, aviation, electricity networks, manufacturing, agriculture, and more.