

Interview with Commodore Jason Armstrong

Director General Naval Force Development

On 28 October 2024, CNR Editor Ann Griffiths chatted with Commodore Jason Armstrong, Director General Naval Force Development. Commodore Armstrong also subsequently answered some follow-up questions. This interview has been edited for length and clarity.

Dr. Ann Griffiths

Thank you for agreeing to chat with me. Before we get to the meat and potatoes, what exactly does the RCN Director General Naval Force Development (DGNFD) do? It's an impressive job title, but what do you do?

Commodore Armstrong

The Naval Force Development scope is large – we're charged with thinking about the challenges and threats of today, and then looking forward to those into the future. Officially, Director General Naval Force Development is accountable for the strategic development of the 'next navy,' including project directorship, training and infrastructure requirements, operational and tactical doctrine, operational testing and evaluation, and doctrine development. The team is responsible for ensuring that the Royal Canadian Navy (RCN) has the tools it needs to train and fight today and in the future.

I am blessed to be working with professionals in the fields of development and maintenance of our war-fighting capabilities, the procurement of equipment for the navy and its sailors, the development of our concept of employment, infrastructure and training, and our long-term strategy.

AG

My first questions relate to technology. I hear a lot about what other navies are doing but not much about the RCN. I'm not seeing an effort in Canada/Department of National Defence (DND) for rapid adoption of new capabilities. What is NFD/RCN doing?

Commodore Armstrong

Apparently we need to do a better job of getting our message out. Canada/the RCN has a history of operating uncrewed aerial vessels (UAVs), uncrewed autonomous systems (UAS) and uncrewed surface vessels (USVs). In fact we've been doing it for a long time. For example, Canada employed Scan Eagle, an uncrewed aerial surveillance system from 2012-2014. We are now working on the ISTAR UAS project, an airborne platform that can be operated from the *Halifax*-class frigates, and we acquired the Puma maritime mini unmanned aircraft system which can be operated off the Maritime Coastal Defence Vessels (MCDVs).



A photo taken of Commodore Armstrong during an industry engagement event co-hosted by the RCN and the Canadian Association of Defence and Security Industries in November 2024.

Credit: CADSI via RCN

The RCN is always examining new capabilities. We are currently engaged in a number of procurement projects to introduce remote and autonomous systems. Earlier this year, the RCN received 60 UAVs for both shipboard and shore use. Additionally, two projects are underway to procure larger, more capable, long-duration military UAVs, with delivery expected in late 2025 or early 2026. As well, the recent *Our North, Strong and Free* defence policy allocated funding for underwater domain awareness projects. Two such projects are the Underwater Environmental Awareness (UEA) and Rapidly Deployable Fully Autonomous Sensors (RDFAS) projects, which aim to procure autonomous underwater vehicles and sensors to ensure domain awareness in Canada's waters, as well as during expeditionary operations.

While it is essential for us to use these systems, we must also be able to counter their use by adversaries. Ultimately, we expect uncrewed systems to dominate the operational theatre in the next decade, necessitating the evolution of our systems to address threats in all domains – air, surface, sub-surface and land when our ships are alongside. Our current detection systems are designed for large, metallic, fast-moving objects. By contrast, uncrewed systems are often small, slow-moving and constructed from materials like plastic and cardboard, which can exploit detection gaps. To address this, we've developed a comprehensive strategy to protect our ships from these threats, from dockside to the operational theatre.

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The asymmetry of cost for some weapons is interesting. Missiles, torpedoes and ships are very expensive and yet, as

we've seen in the Black Sea, an expensive ship can be taken out of action by an inexpensive jury-rigged uncrewed system. How can the RCN deal with the fact that they may end up using their limited supply of very expensive weaponry to counter thousand-dollar drones?

Commodore Armstrong

The RCN is acutely aware of the cost imbalance between uncrewed systems – cheap, plentiful and expendable – and its own traditional defence systems. While current defence systems will continue to play a role in naval warfare, the RCN must address the obvious vulnerabilities that these inexpensive systems exploit. In cooperation with allies, we are exploring ways to augment our defence systems to ensure that the cost of defending our ships remains proportional to the cost that our adversaries face in attacking them.

We have explored low-cost missiles and munitions, electromagnetic attacks (eg., jamming to disarm approaching systems), and are collaborating with our allies on technologies such as Directed Energy Weapons, including High Energy Lasers and High-Powered Microwave systems. The advancements being made by industry in this area are very promising, and we are working closely with our industry partners to address and close this cost imbalance.

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Was the RCN involved in the September 2024 Robotic Experimentation and Prototyping Using Maritime Uncrewed Systems (REPMUS) exercise?

Commodore Armstrong

The RCN has been involved in organizing and executing REPMUS since its inception. REPMUS is the primary robotic experimentation event run by NATO's Joint Capability Group Maritime Uncrewed Systems (JCGMUS), of which Canada is a member. It is an annual event that brings together military and commercial interests for joint

experimentation and tactics development. The RCN contributes a staff officer who provides support to exercise staff and collaborates with participating Canadian companies and organizations to ensure Canada's experimentation goals are met. During REPMUS 2024, two Canadian companies – Kraken Robotics and Jasco Systems – brought developmental systems to the exercise to test physical capabilities, refine operating parameters and enhance system interoperability.

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There are a variety of agencies and organizations involved in naval technology development – for example, the DND IDEaS program and the new NATO DIANA office that just opened in Halifax. Can you tell me a bit about these programs?

Commodore Armstrong

The RCN is an active member of DND's Innovation for Defence Excellence and Security (IDEaS) program which is led by Defence Research and Development Canada (DRDC). The IDEaS program supports innovation from conception to early development. As subject matter experts, we've been consultants on multiple concepts such as land-to-sea transportation with low greenhouse gas emissions, persistent maritime surface sensor systems, and the We Sea You: Digital Tracking and Accounting System on navy vessels. The RCN is also one of the few organizations which works in the classified space under the IDEaS program, specifically the It's Not Just Noise initiative.

The RCN participates in the Innovation, Science and Economic Development Canada (ISED) Innovations Solutions Canada (ISC) program. Over the past several years, the RCN has achieved success through ISC, including the introduction of Single Hand SNAP Sea Connectors into the fleet. Currently, there are two projects which have completed their trials and are moving towards procurement: an Artificial Intelligence- (AI) driven anti-collision



Credit: Timothy Chiot

A model of Textron's Aerosonde 4.7 HQ Uncrewed Aerial Vehicle (UAV) is seen at the CANSEC 2024 defence trade show. It has been pitched as one of the contenders for the RCN's ISTAR Uncrewed Aerial System (UAS) project.

decision aid capability; and a maritime domain awareness tool. Additionally, two other projects are progressing through experimental and trial phases, with engagement from the RCN: a target drone; and a software adaptation for commercial drones.

These successes and ongoing projects are shared publicly, particularly with industry, as we collaborate to enhance RCN capabilities. However, owing to commercial sensitivities, especially with small and medium enterprises, we are careful not to disclose information that could disadvantage the developers.

Despite the successes, the nature of innovation means that not all projects meet requirements at the end of their development phase. These are not considered failures but rather part of the innovation process, which we must continue to embrace.

When new innovative products are ready to be procured and trialed, this is often referred to as ‘buy and try.’ This process allows units which are engaged in operational activities to purchase lower-cost items that can assist them in their tasks. These units can test the products, and if they meet a broader fleet need, they can be added to the list of approved items that can be more rapidly procured. Many of these trials are conducted at the tactical level, enabling operators to advocate for what they need. Ultimately, this approach allows for speed and flexibility in acquiring lower-cost innovative solutions.

As you mentioned, the NATO Defence Innovation Accelerator for the North Atlantic (DIANA) has been set up in Halifax and is expected to be fully operational in 2025. With DND integrated into DIANA, we are well-positioned to take advantage of the opportunities the program will offer, especially given its proximity to the RCN in Halifax, which will facilitate relationship building and collaboration.

These are the specific innovation programs that NFD is involved in on behalf of the broader RCN. We don’t operate in isolation; in fact, we collaborate closely with other innovation sections within various groups throughout DND, Canadian Armed Forces (CAF) and the RCN, including with organizations like DRDC, the Royal Canadian Air Force, the Canadian Army, Canadian Special Operations Forces Command, Director General Maritime Equipment Program Management, Digital Navy and the Naval Training Group.

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I understand that Canada is trying to join the second pillar of the AUKUS agreement – not the submarine pillar but the new military technology pillar. How is that going? What are the priority programs for Canada’s involvement in AUKUS Pillar 2 and how can Canada contribute?



Sailor First Class Justin Bower, a Naval Electronic Sensor Operator, helps recover HMCS *Charlottetown*’s Sparrow Unmanned Aerial System during proficiency training as the ship conducts operational patrols in the Mediterranean Sea while deployed on *Operation Reassurance* on 9 July 2024.

Commodore Armstrong

Consultations with AUKUS members are in their early stages, and we do not yet have a timeline to share. But Canada has a longstanding history of bilateral and multi-lateral cooperation with Australia, the UK and the United States in the research, development and use of advanced capabilities.

What can we offer? Well, we’ve been working with our allies on quantum computing, and uncrewed and autonomous systems so we can bring that to the table. By formalizing collaboration with AUKUS members on shared priorities, we can leverage the cutting-edge innovation that our defence industry brings to the table. Further collaboration with AUKUS partners will develop advanced joint capabilities, ensuring continued interoperability and enhancing collective defence.

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How does RCN/NFD see the use of Artificial Intelligence (AI) affecting operations? How is the RCN utilizing, or planning to utilize, AI, if at all?

Commodore Armstrong

We can see AI being useful in many aspects – the spectrum of potential for AI is enormous from project administration to enhancing operations at sea. We now have AI at National Defence Headquarters and this allows us to use it on ships as well, although the full capabilities on ships are still being determined.

What we already know is that ashore AI can be useful in terms of project administration, document drafting, and enhancing our Naval Training System by developing/revising training strategies, developing/revising course

materials and testing trainees. It can also be extremely useful in keeping track of personnel and maintenance schedules.

In terms of operations, AI enables a ship to take data and analyse it – for example data relating to ship systems, physical conditions of the operating environment, logistics and/or maintenance. This could enable preventive or corrective action. And in terms of war-fighting, AI allows ships to process information rapidly to assist in decision-making, targeting and defence.

Key focus areas include digital- and AI-enabled solutions such as increased automation for *River*-class destroyers, the Canadian Patrol Submarine (CPS) Project, underwater warfare rapid processing and uncrewed systems, RCN ISTAR's expedited operations and data management.

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What lessons are you identifying from Russia's invasion of Ukraine in terms of naval vulnerability, capability and flexibility? Are the maritime lessons from Ukraine and the conflict(s) in the Middle East being worked into Canadian Force Development considerations?

Commodore Armstrong

We're closely monitoring this conflict, as well as various others worldwide, to gain insights into emerging operational capabilities. Ukraine's success in the Black Sea highlights vulnerabilities not only relating to uncrewed and counter-uncrewed systems but also in electromagnetic operations and traditional kinetic attacks – areas in which we are also making advancements.

Russian naval failures in the Black Sea underscore the critical importance of personnel readiness, fundamental skills and professional discipline within military forces. Key incidents, such as the sinking of *Moskva* and the difficulties in countering Ukrainian drones and missiles,

reveal that unprepared crews can affect defences, even with the most advanced equipment, platforms and weapons. These real-world setbacks highlight gaps in basic training, adaptability and preparedness of Russian sailors, all contributing to operational lapses and low morale.

The broader lesson for militaries is clear: effective naval power depends not only on advanced capabilities, but also on well-trained, cohesive, committed professionals capable of adapting to high-stakes, complex and evolving modern warfare environments. This serves as a reminder that training, basic skills and the highest degree of leadership remain crucial – and we remain committed to that.

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Given the importance of private industry in developing the capabilities (and personnel) necessary for tomorrow's RCN, as well as for supporting RCN missions, what sort of collaboration, if any, is occurring?

Commodore Armstrong

The RCN has made a deliberate effort to increase collaboration with the defence industry, particularly in Canada. Our people regularly attend industry engagements in Canada, and globally, with the goal of understanding a range of perspectives, and what we might be able to do to enable Canada's capacity to contribute. Getting out and interacting with industry, including First Nations and Inuit businesses, makes us smart buyers as we learn what the state of the art is, and what's in the realm of the possible. It also enables the development of a supply chain that is positioned to enable Canada's long-term objectives amid the specter of a rules-based international order under continued threat. We are very interested in engaging with all corners of Canada's defence industrial base and beyond. In the end, we can't deliver our program without the support of industry, so it's very much a team effort.



Canadian sonar company Kraken Robotics integrated its mine detection sonar into the Uncrewed Underwater Vehicles of four other NATO navies as part of the REPMUS 2024 exercise.

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What threats are you seeing emerging today that haven't been considerations in the past but will be in the next 10 years? What capabilities will be necessary to meet these threats?

Commodore Armstrong

We are only beginning to see the potential of uncrewed systems in the operational theatre. These capabilities have rapidly evolved, including what they can carry, how far they can travel, and how long they can remain operational. Their level of automation has increased exponentially, allowing them to navigate complex terrain, defend against attacks, and adapt missions or strategies autonomously. This impressive self-coordination makes them challenging to defend against and has changed the nature of warfare. Additionally, we are observing the emergence of long-range hypersonic and anti-ship ballistic missiles, enhanced capabilities to manipulate and control the electromagnetic environment, and the development and use of Directed Energy Weapons.

NATO has recently begun studying what is referred to as Seabed Warfare. The destruction of the Nord Stream undersea pipeline in 2022 highlighted the vulnerability of critical undersea infrastructure. Damage to these systems could have a crippling effect on our national economy.

And most importantly there is the Canadian Patrol Submarine Project. Submarines will be a key capability in protecting Canada's undersea interests. The ability to detect, deter and, if necessary, destroy threats to national undersea interests primarily depends on a submarine fleet. Adversary submarines pose a significant threat to Canada and anti-submarine warfare is more important than ever to the defence of North America and beyond.

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Let's talk about technology in terms of RCN ships. The Arctic and Offshore Patrol Ships (AOPS)/Harry DeWolf-class are very lightly armed. If Canada is forced into conflict, can the AOPS be 'up-gunned' with uncrewed systems so they are useful in conflict? And will they be able to defend themselves against uncrewed systems?

Commodore Armstrong

The *Harry DeWolf*-class is a flexible and technologically advanced class of ships, capable of conducting missions in Canadian coastal waters, including the Arctic, and deploying globally to support government objectives abroad. But you have to remember that our main current war-fighting capability is the frigates. The *Halifax*-class has been modernized and the ships are our war-fighters.

We have only begun to explore the full potential of the *Harry DeWolf*-class. We continue to investigate ways to augment its capabilities to meet threats. As part of our



Vancouver's AIM Defence won first place in the 2024 DND IDEaS counter-UAS challenge. The Fractl:1 laser successfully engaged over 30 drones at up to 1.5 kilometres away.

strategy, we are ensuring that all ships have the capability to counter uncrewed systems. Some of the systems we are procuring are easily transferable between different ships. We are enhancing our Force Protection Component on all ships and purchasing equipment that can be rapidly set up on the upper decks or on accompanying small boats on various missions. These systems are based on dismounted soldier systems and adapted to our needs, ensuring that any ship requiring the capability can be quickly equipped.

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When a traditional ship, such as Canada's new destroyers, takes 10 years to design and 20 years to build, the technology on board could be outdated before the ship is even launched. Can the technology of Ship 1 be expected to be effective and relevant by Ship 15? How can the fleet be structured to manage technological changes? Is the force development/procurement process agile enough to keep pace with technological changes?

Commodore Armstrong

We're confident that the *River*-class destroyers will have the capability to adapt to any mission to which they are assigned. They'll be able to conduct a broad range of tasks, including regional engagements, delivery of humanitarian aid, search and rescue, law and sovereignty enforcement, and medium-intensity operations such as counter-piracy, counter-terrorism, interdiction and embargo operations. Ultimately, they will deliver decisive combat power at sea and in support of land operations as needed.

The *River*-class will be equipped with the sensors and weapon systems to defend themselves and enable a task group to operate against a full range of maritime threats in the air, surface, undersea and information warfare dimensions. Additionally, they will be interoperable with our allies, allowing Canada to make a contribution to NATO and other coalition efforts as circumstances demand.



Sailor First Class Raymond Kwan, Naval Combat Information Operator, works at a console aboard HMCS *Harry DeWolf* during a proficiency sail on 4 November 2020. The sinking of the Russian cruiser *Moskva* by Ukraine demonstrates the importance of a well-trained crew, not just sensors and weapons.

AG

Admiral Topshee has stated that the River-class destroyers will be upgraded in future flights, how will that be accomplished? What will have to be deleted from the current design to make room?

Commodore Armstrong

The River-class project is equipping the RCN with modern equipment, sensors and weapons necessary to counter a full range of maritime threats. As technologies evolve, both during the project's life-cycle and once the ships are in service, Canada will continuously explore opportunities to integrate new technologies. This approach ensures that we remain ready to face emerging threats.

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I know that the RCN does not make such decisions – the government does – but given that many analysts predict the time-frame for a major conflict to be within the next 3-5 years, is the RCN looking at ways to acquire hulls (probably of the less complex Tier 2 type) to meet probable urgent demand? In other words, is the RCN investigating ways of quickly acquiring surface ships from elsewhere (as other countries are doing) while the River-class destroyers are being built, and to supplement them if necessary?

Commodore Armstrong

We have capabilities. As I said earlier, the *Halifax*-class frigates have recently been modernized and are very capable platforms. And the submarines still have some operational life left – they'll be upgraded to stay in the fleet until 2035.

The RCN is undergoing its largest fleet recapitalization since the Second World War. The missions the RCN is expected to execute are driven by government defence policy, such as *Strong, Secure, Engaged* and *Our North, Strong and Free*. We continuously evaluate the types of platforms, capabilities and quantities needed to meet these obligations. It's about achieving the right balance or mix of tools for the job in the appropriate quantities. We're currently collaborating

with the defence industry to acquire platforms like the River-class and submarines as quickly as possible.

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I have two quick questions to follow up on this. First, it sounds like the answer is No, the RCN is not investigating ways of quickly acquiring ships while it waits for the River-class to become operational? Second, I notice that you don't mention the AOPS in terms of assets to use in case of conflict.

Commodore Armstrong

I can't comment about acquiring Tier 2 ships. All I can say is we are looking forward to obtaining the River-class destroyers. And we are looking at how to augment the AOPS. As well, there has been discussion about replacing the MCDVs with the Canadian Multi-mission Corvette. This project has been discussed, and is on the RCN books, but as yet it doesn't have policy coverage. We continue to engage with the defence industry and welcome their ideas and suggestions about systems and platforms.

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Australia conducted a very comprehensive and independent study of its surface fleet and came out with a series of recommendations. What is Canada's plan for a future fleet-mix study? Is there one in progress? At what stage is it?

Commodore Armstrong

The RCN is in the latter stages of completing a Fleet Mix Study. It's being undertaken by Director of Naval Strategy and Assistant Deputy Minister (ADM) of DRDC's Maritime Operational Research Team with the purpose to examine scenarios and evaluate different mixes of fleet platforms and readiness to quantify the right balance for both the surface and submarine fleets. Preliminary results show that the RCN is on track with its current fleet intentions to be properly positioned to meet the requirements of Canada's defence policy aims. We expect to see the final report in the first half of 2025.

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Recruitment and retention continue to be concerns. Are personnel shortages affecting decisions about technology, capabilities and platforms? Obviously new ships and submarines need crews, and even 'uncrewed' systems still need personnel for operations and maintenance.

Commodore Armstrong

The RCN, like the rest of the CAF, has faced challenges in recruiting, training and retaining Canadian talent. This issue has the potential to negatively impact our operations and capabilities. Crewing and personnel are other uses for AI – i.e., looking at optimal crew sizes, and developing simulators and training programs for the new ships.

While we've been working to address personnel challenges through various stages – from recruitment to employment



Commander of the RCN, Vice-Admiral Angus Topshee, visits the Hanwha shipyards in South Korea on 10 November 2024. South Korea's shipyards have become a potential source for additional capacity that can support the shipbuilding requirements of other countries.

and retention – there is no quick fix. We have strategies and initiatives to attract new sailors to the navy, such as the Naval Experience Program which aims to reduce the time it takes to transform civilians into sailors while allowing them to experience life in the navy before choosing a trade. There are no strings attached; after a one-year term of service, participants can choose to continue serving with the navy, either full- or part-time, or leave if it isn't a good fit for them. The program also allows the navy to assess the suitability of new recruits. To continue meeting our operational obligations, we have to attract and retain the best Canadians to a life of naval service. These people will underpin our security and prosperity and this rightly remains our highest priority.

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Assuming that Canada goes ahead with the purchase of 12 submarines, how the heck will the RCN find enough crew for them?

Commodore Armstrong

We have no shortage of volunteers for submarine service, and the opportunity to serve aboard our submarines remains a popular posting aspiration. We already have a plan in place to crew the new submarines, and the Naval Experience Program will also enable this effort. New sailors, having had the opportunity to be exposed to our submarines, will no doubt place them on their list of opportunities to pursue during their career in the navy.

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When looking at global strategic trends, which potential shocks do you think are likely to cause the greatest challenges?

Commodore Armstrong

The need to build ships and field a diverse range of capabilities in facing a wide range of emerging threats is constantly growing, leading to an increased demand for shipbuilding, innovation and high-tech component manufacturing. Canada faces the challenge of balancing the development of our national capability with our capacity in this area. Our shipbuilders are re-emerging as global

industry leaders, as evidenced by the recent Icebreaker Collaboration Effort (ICE Pact) agreement with the United States and Finland. However, some of our allies and partners have larger shipyards that can build ships faster and at a lower cost. These are realities that we must balance as we continue to work with industry alongside the threats that are before us.

As AI continues to be developed and deployed in tactical units, the demand for data transmission will exceed the current capabilities of our warships. Significant efforts are being made by Canada and our Five Eyes allies to develop secure, high-volume communication technology. This includes space-based solutions and innovative methods of using radio waves to transmit more data within the same bandwidth while being less detectable by adversaries.

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Aside from more money and more people, what would be on your wish list in order for NFD to do its job better?

Commodore Armstrong

On my wish list would be increased and stronger relationships within government and with external actors. Relationships and relationship building have been key to the RCN in executing its Force Development program. Within DND, the RCN needs to ensure that all of our partners are aware of and understand our requirements, and how they must play a part in the way ahead. Take the submarine project for example: a great deal of engagement was conducted across DND and beyond as that project progressed through the Identification Phase.

NFD has worked hard to engage with other government departments – such as Canadian Coast Guard, Finance, Global Affairs, Innovation, Science and Economic Development, Public Service and Procurement, and Treasury Board – ensuring that they understand our requirements, what we are attempting to do and why. We find it useful to ensure that there is a face to a project and a person who those in the other departments can reach out to engage with the RCN.

Additionally, we have initiatives to engage with Canada's defence industrial base in a more deliberate manner. It is important to the RCN that industry and those working internally to the government have an understanding of how each other operate and what is important from a project perspective to advance the RCN's program. Lastly, and perhaps most importantly, we need to engage with the Canadian public.

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Commodore Armstrong this has been very illuminating. Thank you for taking the time out of your busy schedule to answer my many questions. 🇺🇸