# TECH NOTES

Edition 2 – June 2024

Tech notes is a newsletter produced by the CATCA Technology Committee for the purpose of providing information to CATCA members regarding technology, current and future, in NAV CANADA.

## Evolution of ATC Communication

The legacy voice communication systems currently deployed (VSCS/NVCS/BUCS) in facilities across the country have reached their end-of-life stage. These systems, the backbone of communication in our airspace, are now facing challenges such as outdated hardware, limited scalability, and rising maintenance costs. The need for a transition to modern solutions has become undeniable.

The company began a project a couple of years ago to replace the legacy systems as well as the infrastructure those systems utilize. The new systems selected, Frequentis X10 and Rohde & Schwarz 4GVS, are cutting-edge IP-based, data center-driven solutions enabling comprehensive virtual center functionalities, facilitating seamless dynamic sectorization and rapid contingency responses to unforeseen disruptions. This includes empowering Air Traffic Control Officers (ATCO) with the flexibility to access any frequency from any location, whenever necessary. Additionally, resiliency and overall availability within the primary system will, in essence, have both the main and backup systems built into one. Thus, allowing the alternate system to be considered a tertiary system, which will only be needed in the extremist of cases.

***What does this mean for controllers?***

The actual use of either system does not differ significantly; ATCOs will continue to communicate with aircraft and other ground positions in the same manner. The major change for ATCOs, especially in ACCs, will be their ability to launch missions or assume roles independently, without needing a DSC's assistance. The most significant improvement lies in the system's capabilities. As an IP-based and data center-based system, it offers complete flexibility in resource utilization from any location. For example, the Vancouver ACC could operate Gander ACC frequencies. This flexibility is crucial to allow for adjusting sector and FIR boundaries based on traffic and staffing needs, allowing sectors and boundaries to be configured dynamically. In theory, this system enables a single ATCO to manage the entire country's airspace from one position. The overall system capabilities will not be realized until all the systems are installed, and the infrastructure is updated, all of which is expected in the next ten (10) to fifteen (15) years.

## AI and Radio Noise Reduction

Frequentis, the provider of the new X10 communication system, has been utilizing Artificial Intelligence (AI) software and ATC recordings to create a program that reduces or eliminates background noise during VHF or HF radio communications. This software can distinguish between voice and frequency noise, such as low-level static, and remove the noise from the transmission, allowing the ATCO to hear only the voice.

ATCOs may not typically notice background noise because it is present in every transmission to some extent and is usually unconsciously ignored. However, once the noise is removed, the difference becomes apparent, significantly enhancing the clarity of transmissions that ATCOs might describe as "5 by 5."

Although still in development, Frequentis anticipates that this feature will be available for 'Short-Term Recording' playback at the X10 position. It is currently uncertain if it will be included in the initial installations. Frequentis aims to eventually incorporate this capability into live, real-time radio transmissions.

If you are interested in hearing audio samples comparing transmissions with and without this capability, please email catca.technology@gmail.com

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If you have questions or would like more information about ATS technology or CATCA technology roles, please contact any member of the CATCA Technology Committee or email catca.technology@gmail.com.

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*Technology is a useful servant but a dangerous master. ~ Christian Lous Lange*