

Simulation Emulation Stimulation

An introduction to creating simulated environments

Air Traffic Management is as vital as it is complex. Adopting Air Traffic Control simulators supports a seamless transition from training to live operations. Due to the return on investment, many ANSPs have made simulators an integral part of their asset infrastructure.

Choosing the right method for your simulator environment can be difficult. In this guide, we outline three methods for consideration when choosing your next simulator solution.

Three options for creating your simulator environment

BEST For Simulation

The BEST simulator is capable of supporting civil and military applications for training and evaluation.

These capabilities include:

- Time and exercise controls
- Record and replay
- Creation and modification of airspace and exercises
- Scenario testing

While the training procedures available in a simulation environment are similar to real operational procedures, they comprise a generic, non-specific set of controller and ATC tools.

This is a solution that is ideal for initial training.

BEST For Emulation

For Emulation systems, all displays can be created to replicate the operational display and controller HMI functions mapped into radar capability.

Micro Nav has decades of experience in successfully delivering emulation systems for both Tower and Radar. We work with your team to define the appropriate level of fidelity and toolset optimisation for your emulation system. This commitment is underlined by our sizeable industry experience and our understanding of HMIs importance to Air Traffic Controllers in the operational environment.

BEST For Stimulation

Stimulation is the most immersive and realistic training and simulation product we can provide, and is one we have been successfully delivering for over 20 years.

We've worked with leading en route ATM system providers – including Frequentis Comsoft and Indra Sistemas, to integrate Tower and Radar environments with operational equipment through representative interfaces.

This solution leads to the highest level of on-console training using real operational equipment.

	Simulation Considerations	Emulation Considerations	Stimulation Considerations
Benefits	Off-the-shelf hardware with scope for a wider range of students from ab-initio training and continuation training, as well as abnormal and emergency scenarios.	Offers reduced conversion time after initial training. Also offers greater focus on specific ways of interaction with a particular OEM's interface.	Reduction in conversion training time and the risk of adverse effect to the operational system. There is also risk mitigation concerning efficiency and safety.
Flexibility	Highly customisable, but limited realism compared to emulated or stimulated systems. Perfect for non-training tasks.	Training can be structured around specific scenarios to reflect the operational environment.	New versions of operational equipment software and operational techniques can easily be trialled in the stimulated environment.
Realism	'One-size-fits-all' relies on some conversion training to the operational equipment.	Increased scope for realism by emulating the operational system.	Training fully replicates the operational environment.
Risks	Could potentially be less efficient in advanced stages of ATC Training.	Customers must gain permission from OEMs (Original Equipment Manufacturers) for emulation.	Close collaboration between the customer, Micro Nav, and the OEM may be required.
Scalability	Easily scaled up to support additional student throughput.	Interface between FDP and HMI can be updated and adapted to facilitate functional changes, without impacting operational systems.	Use and update operational equipment to continuously increase training realism relative to the operational environment.

To discover more about Micro Nav's solutions for Simulation, Emulation, and Stimulation, contact our sales and support team who will be on hand to guide you through every step of your simulator journey. We ensure you get the most from your prospective simulator solution.



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The Quadrant Group's mission is to make a meaningful positive difference to aviation safety by providing and enabling the world's best-trained air traffic controllers. We do this by engineering the industry-leading tool for training, development, and operational testing, as well as offering consultancy and support services to assist customers in establishing and running training centres of excellence.