An ANSART tower simulator

Transforming ATC Training

with AI-Powered Simulation and Specialised Training

Air Traffic Control (ATC) is one of aviation's toughest jobs—demanding quick decisions, safety focus, and handling complex airspace. Top-tier training needs real-world scenarios, hands-on practice, and advanced AI simulation technology.

ATC simulators are an essential component of air traffic control training, offering a realistic and controlled environment where trainees can develop the necessary skills before stepping into live operations.

BELOW: Radio, flight plans and radar system of a radar simulator

Enhancing Training with AI-Driven Intelligence

Artificial Intelligence (AI) is revolutionising Air Traffic Controller (ATCO) training by making simulation exercises more efficient, adaptive, and data-driven. AI-powered simulators introduce several key benefits:

• **Adaptive Learning Paths:** AI continuously adjusts the difficulty and complexity of scenarios based on the trainee's performance.

• **Automated Voice Recognition:** Controllers can interact with virtual pilots and automated systems, improving their communication skills in a realistic ATC environment.

• **Performance Analytics and Feedback:** AI-driven insights track progress, highlight areas of improvement, and provide targeted recommendations for skills development.

• **Real-Time Scenario Adjustments:** The simulator modifies traffic patterns dynamically, preparing controllers for unpredictable air traffic situations.

• **AI-Enhanced Training Capacity:** AI reduces the need for human pseudo-pilots, cutting operational costs while maintaining high training efficiency.

• **Emotional Behavior Analysis:** The AI system constantly analyses trainees' emotional responses, stress levels, and cognitive load during training sessions, providing instructors with real-time advice on how to adapt their training methods and offer support.

ANSART: Innovation in Air Traffic Control Simulation

ANSART, a Netherlands-based company and leading innovator in advanced ATCO simulation development, is actively expanding its AI capabilities to revolutionise ATCO training. While not all AI features are fully deployed yet, the company is working diligently to deliver a comprehensive, intelligent training solution. This ongoing development ensures that ANSART remains at the forefront of simulation technology. By gradually integrating AI-driven tools, ANSART aims to enhance both the efficiency and realism of ATCO training and is glad to state that the following features have already been implemented in the ANSART ATCO Simulator, enhancing training realism and efficiency:

• **Voice Detection:** The system actively monitors the controller's voice input, accurately distinguishing between silence, background noise, and valid ATC commands.

• **Speech Recognition:** Using advanced Advanced Speech Recognition (ASR), spoken instructions are transcribed and key elements like altitude, heading, speed, and callsigns are extracted

• **Command Interpretation:** Commands are matched against standard ATC phraseology and interpreted in real-time, based on the aircraft flight plan and situational context.

• **Simulated Execution:** The simulator updates aircraft behaviours accordingly, simulating realistic performance based on aircraft type and phase of flight.

• **AI Pilot Response:** A built-in text-to-speech engine generates realistic pilot replies using standard radiotelephony phraseology, with a variation in accent and readback style to enhance immersion.

• **Audio Feedback:** The synthesised pilot response is transmitted back to the controller as audio.

NELSO: Comprehensive ATCO Training Solutions

At NELSO, a Spain-based company, trainees receive top-tier air traffic control training powered by high-end simulation technology. By integrating ANSART's advanced simulators into its programs, NELSO ensures that students gain hands-on experience with cutting-edge solutions that enhance learning outcomes. Whether they are starting their ATC journey or looking for ways to advance their skills, NELSO offers structured courses—designed to meet international standards—that blend traditional expertise with innovative applications, preparing trainees for real-world operational demands. These include:

• **Full ATC Rating Courses** covering Tower, Approach, and Area operations.

• **Modular Training** for those focussing on specific areas such as Tower, Approach, or Area control.

• **Specialised Training,** including:
   Instructor Training (OJTI/STDI) to develop on-the-job training instructors.
   Evaluator Training for ATCO assessors.

A trainee controller in an ANSART tower simulator

ATC Refresher Training to maintain and enhance controllers' proficiency.
ENAIRE Selection Preparation Course, a tailored program for EU nationals with ICAO Level 6 Spanish proficiency, designed to maximise candidates' success in one of Europe's most competitive ATC selection processes.

Why Choose NELSO?

For aviation authorities, Air Navigation Service Providers (ANSPs), and aspiring air traffic controllers, choosing NELSO means investing in a superior training experience backed by cutting-edge technology and world-class expertise.

• **Industry-Recognised Training Programs:** the courses meet ICAO, EUROCONTROL, and/or EASA frameworks.

• **Flexible and Customisable Training Options:** the courses are tailored to individual and organisational requirements.

• **State-of-the-Art Training Facilities:** equipped with the latest ANSART simulators.

• **All- Premium Training in Exclusive Locations:** NELSO offers world-class training at its locations in Spain: Madrid and Las Palmas (Gran Canaria).

• **All-in-One Training Packages:** NELSO provides comprehensive packages that include airport transfers, comfortable accommodations, and a variety of entertainment and leisure activities to enhance the overall experience.

• **International Connectivity:** Convenient access for students from around the world.

The Future of ATC Training Starts Here

With AI-powered simulation and top-tier instruction, ANSART and NELSO are transforming air traffic control training. Whether you are an aspiring controller or an aviation organisation seeking the most advanced training solutions, this partnership offers the perfect pathway to success in the demanding world of air traffic management.

Contact us today and discover how ANSART & NELSO can advance your air traffic control career!
www.ansart.nl - www.nelsoatctraining.com