

AVIATION SPEECH RECOGNITION SYSTEM USING ARTIFICIAL INTELLIGENCE

Appareo's embeddable AI model for air traffic control (ATC) transcription makes the company one of the world leaders in aviation artificial intelligence.

TECHNOLOGY APPLICATION

As featured in Appareo's two flight apps for pilots, Stratus Insight™ and Stratus Horizon Pro, the custom speech recognition system **ATC Transcription** makes the company one of the world leaders in aviation artificial intelligence.

ATC Transcription is a recurrent neural network that transcribes analog or digital aviation audio into text in near-real time. This in-house artificial intelligence, trained with Appareo's proprietary dataset of flight-deck audio, takes the terabytes of training data and its accompanying transcriptions and reduces that content to a powerful 160 MB model that can be run inside the aircraft.

BENEFITS OF ATC TRANSCRIPTION:

- Provides improved situational awareness by identifying, capturing, and presenting ATC communications relevant to your aircraft's operation for review or replay.
- Provides the ability to stream transcribed speech to on-board (avionic) or off-board (iPad/iPhone) display sources.
- Provides a continuous representation of secondary audio channels (ATIS, AWOS, etc.) for review in textual form, allowing your attention to focus on a single channel.
- ...and more.

What makes ATC Transcription special is the context-specific training work that Appareo has done, using state-of-the-art artificial intelligence development techniques, to create an AI that understands the aviation industry vocabulary. Other natural language processing work is easily confused by the cadence, noise, and vocabulary of the aviation industry, yet Appareo's groundbreaking work has overcome these barriers and brought functional artificial intelligence to the cockpit.

COMPARISON EXAMPLE

	A typical speech recognition system	Appareo's custom aviation speech recognition system
Altitudes	One zero ten thousand	10,000
Call signs	November two two eight four quebec	N2284Q
Runway	Runway three six one eight	Runway 36R - 18L
Frequencies	One two zero point four	120.4

NO CLOUD REQUIRED

It is very difficult to run speech recognition models locally at the edge (e.g. inside an aircraft or other vehicle without connecting to the cloud). Typical language processing AI systems leverage significant server infrastructure to process speech, while Appareo is currently running ATC Transcription on an iPad or iPhone. What's more, the model is capable of being hosted on other hardware platforms like the nVidia Jetson Nano, or a custom solution manufactured by Appareo (see image below). This allows ATC Transcription to operate outside of network coverage, safely and securely performing its function.

Appareo can build a hardware solution to host the ATC Transcription system in a variety of environments, either embed-able inside other avionics or separately packaged in a manner compliant to DO-160 requirements.



POSSIBILITIES

Although Appareo's training infrastructure has been focused on ATC speech, this infrastructure could be applied to other mission-specific audio information to achieve similar in-vehicle results. Contact Appareo today to investigate whether or not these technologies can be applied to your communication and situational awareness challenges.

Visit our website to learn more about our services and capabilities:
www.appareo.com

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