STATEMENT OF WORK

1. Objective/Requirements

The purpose of the Flight Deck Collaborative Decision Making (CDM) Research Project is to improve aircraft surface movement by creating a seamless flow of data that supports more effective decision making. The concept increases operational efficiency by reducing repetitive taxi instructions and opening the door to CDM-enhanced Electronic Flight Bags (EFB) applications.

This requirement is for the NASA Ames Research Center. Phase I work explored feasibility of using off-the-shelf (baseline) speech to text models and compute performance metrics (word error rate) across different baseline models. Phase II work included services that collected extensive taxi audio and built on a custom speech to text analysis model. Phase III work included automated speech to text transcription of taxi audio, extraction of taxi instructions from the transcript (text) and conversion of text taxi instructions to digital taxi instructions in a format that is accepted by the EFB app. At the end of Phase III, the custom controller audio to digital taxi instruction was live tested in a demo environment. Phase IV continued to evaluate and assess the model accuracy and focused on new criteria including transcription speed and additional taxi instruction elements. With Phase V, the objective is to implement an edge audio device to capture tower audio from Moffett Field, transcribe and digitize verbal taxi instructions during simulated, real-time demonstrations.

The goal of Flight Deck CDM exploratory project is to: (1) digitize the analog Very High Frequency (VHF) aircraft taxi commands, (2) live translate with a Google Speech-to-Text LLM, (3) convert the captured text to a digital taxi instruction, (4) publish the digital taxi instruction to the pilot via their EFB, and Air Traffic Control (ATC) via an Enterprise Agreement for Public Sector Subscription access to all Google Cloud Platform Solutions (9A92-40AE-8D00).

The work is being accomplished in phases as feasibility and direction are assessed. This next phase V of work seeks to improve the transcription speed, latency and accuracy of the model and implement and test an edge audio device positioned near a remote pilot-in-command to record and transcribe verbal taxi instructions. This performance work statement is for the edge device, including hardware requirements and support required during the planned test demonstrations.

Requirements:

- Improve existing ground-based unit (GBU) from phase I which consists of a Raspberry Pi paired with audio processing electronics and an attached VHF radio transceiver that receives and prepares audio for transmission to Google Cloud.

- Optimize the existing GBU to maximize audio fidelity (minimize ambient noise) and speed for transcription
- Install and set up the GBU at NASA Ames Research Center/Moffett Field
- Test data quality, mitigate noise and evaluate data metrics
- Code data capture and chunk/clip into segments for cloud storage.

- Support
  - Maintenance support for ongoing data collection during contract period
  - In-person support of shadow mode test assessment activity (Nov, 2026)
  - In-person support of live-assessment test activity (March, 2027)

2. Characteristics, Scope, and Specs

DELIVERABLE	DESCRIPTION	DATE
Phase V Deliverable 1	**Install GBU** Exact location at NASA Ames Research Center TBD. Install and quality test data collection and storage capabilities.	
Shadow Mode Test Deliverable 2	Support test-run at Moffett Field using live or simulated audio	November TBD, 2026
Live Assessment Deliverable 3	Support test-run at Moffett Field with RPIC (remote pilot in cockpit) and mock tower	March TBD, 2027
Phase V Deliverable 4	Provide ongoing support/maintenance of GBU to ensure quality, ongoing data capture and collection	As needed during PoP

3. Place of Performance

Ames Research Center (ARC)

4. Period of Performance

Various PoP Dates as shown above