UAM Noise Working Group Meeting
Subgroup 2: Ground & Flight Testing

21 October 2021

Virtual Meeting

Group Leads:

Devin Boyle (NASA, GRC), Juliet Page (Blue Ridge Research & Consulting), Kyle Pascioni (NASA, LaRC)

SG2 Activities

- Co-Leadership:
  - Devin Boyle (NASA, GRC)
  - Juliet Page (Blue Ridge Research & Consulting)
  - Kyle Pascioni (NASA, LaRC)

We have an active subgroup!

- Monthly Team meetings:
  - Third Thursday of the month, 12-1pm ET
  - Appx. 20-30 in attendance at meetings
  - Appx. 45 on distribution
- Draft document prepared identifying measurement protocols
  - Shared Document development via OneDrive hosted by E. Greenwood (PSU)
  - Repository for SG2 materials

- The following topics were briefed:
  - Ben Goldman, Archer OML Release, April 2021
  - Bob Dougherty, Measuring Sound Spheres with an Acoustic Camera, May 2021
  - Gokul Srinivasan, AiRMOUR – UAM Noise Modeling & Aeroacoustics, May 2021
- Upcoming Discussions *(@Breakout)*:
  - Natasha Schatzman , Acquiring acoustics for rotors in the NFAC 40-by 80-Foot Wind Tunnel
  - Review draft protocols document

Goal: Ground & Flight Testing Subgroup Goal

Develop a research measurement standard or set of guidelines which can be used to adequately quantify community noise impact

Approach: *Define measurements suitable for the creation of acoustic spheres*

- Ensure sufficient data is gathered to support quantifying community noise impacts
- Activities coupled with all the other SGs: Tools/Technologies, Metrics, Regulation & Policy

- Draft protocol document has been developed
  - Created topic groups to develop content for each relevant section of the document
  - Define a prioritized list of all possible measurements that would fully define the acoustic environment for the community – potentially perform an extensive test (possibly multiple tests)
  - Define a subset of measurements and requirements for a standard – this will likely require analysis (from multiple groups) of the data from an extensive measurement campaign

SG2 Measurement Protocol Outline

Introduction

Measurement Protocol

- Environment:
  - Temperature and Humidity
  - Wind
- Background Noise
- Signal to Noise Ratio Assessment
- Ground Impedance
- Terrain and Obstructions
- Microphone Positions and Orientation
- Time Synchronization
- Signal Processing

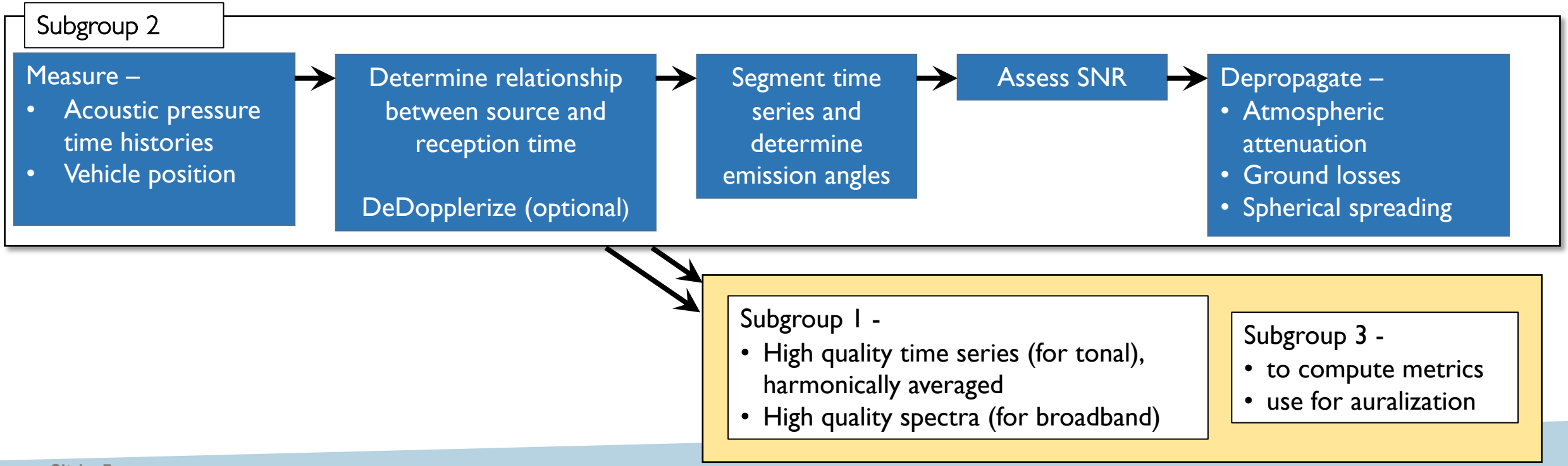
Open Items and Discussion Topics

- Future Considerations for Subgroup 2

Review current research, existing standards, certification procedures and guidelines. Discuss interrelated items and develop SG consensus on testing topics, including confidence level needs.

Empirical Data Processing

- Connection with other Subgroups
  - Document will be shared with other Subgroups, feedback requested
- Process ground-based acoustic measurements of steady flight conditions to provide input to Subgroups 1 and 3



Ground and Flight Testing SG Data Status and Requests

- Datasets with sharing *potential* for advancing procedure development via analysis:
  - FAA UAS National Airspace Integration Pilot Program – Measurements of Unconventional Aircraft - Choctaw Nation of Oklahoma, Daisy Ranch
  - PSU/FAA multirotor UAS, Beta Technologies vehicle (data to be acquired)
  - NASA/FAA civil helicopter data (limited set of R44 flyovers)
- Request to the UAM community – Vehicles for acoustic measurements
  - Would provide crucial data!
  - Would provide you with quality acoustic measurements and a better understanding of potential community impact
- Request to other UNWG subgroups:
  - Feedback on SG2 protocols document
  - Input from tools group on what outcomes from measurements may be useful
  - Input from metrics group on any specific attributes of importance

Ground & Flight Testing Subgroup Info

- Please reach out to Leadership to join our Group
  - Devin Boyle devin.k.boyle@nasa.gov
  - Juliet Page juliet.page@blueridgeresearch.com
  - Kyle Pascioni kyle.a.pascioni@nasa.gov
- We have several interesting topics for the SG2 Breakout Session
  - Natasha Schatzman (NASA Ames) – Acquiring acoustics for rotors in the NFAC 40-by 80-Foot Wind Tunnel
  - Live review of the draft protocols document