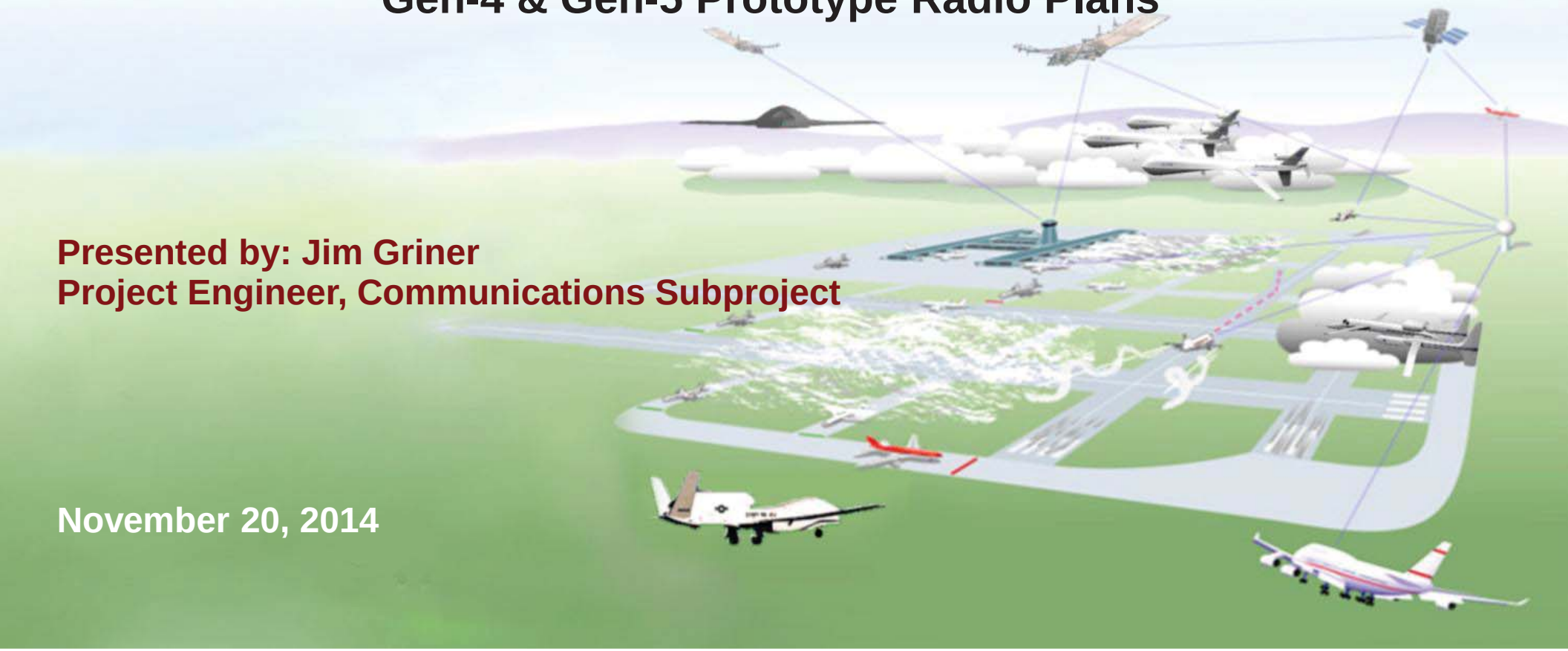
National Aeronautics and Space Administration

# Unmanned Aircraft Systems (UAS) Integration in the National Airspace System (NAS) Project

## Gen-4 & Gen-5 Prototype Radio Plans



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# Previous Radio Versions

Gen-1

- L-Band Only
- One Aircraft – One Ground Station

Gen-2

- Added C-Band
- One Aircraft – Two Ground Stations
- Layer-3 Handoffs

Gen-3

- Multiple Aircraft – Multiple Ground Stations
- Layer-2 Handoffs

# Gen-4 Radio Summary

- No Layer-1 changes intended to be made
- Utilize original downlink “weather” mode will be used as new C2 downlink, in order to test Layer-3 and above mechanisms.
  - Software configuration used to artificially constrain number of bits per frame
- 8 Traffic Priority Levels

# Gen-4 Radio Schedule

| | |
|---|---|
| 11/14/14 | Informal release |
| 1/27/15 | Formal Release |
| 1/28/15 | Flight Test Start |
| 2/25/15 | Flight Test End |

# Gen-5 Radio Summary

- Update Layer-1, based on WG-2 data requirements
  - C2 downlink:
    - Telemetry
    - Navaid Data
    - ATC Voice
    - ATC Data
    - DAA Downlink
    - Weather Radar (If new numbers are relatively small)
  - Video downlink
  - C2 uplink (selectable single user and 20 user modes):
    - Telecommand
    - Navaid Settings
    - ATC Voice
    - ATC Data

# Gen-5 Radio Summary (cont.)

- Update Layer-2
  - Add additional link status messages
  - Implement Layer-2 Security

# Gen-5 Radio Schedule

| | |
|---|---|
| 2/24/15 | 5.0 Waveform Specification Released |
| 3/3/15 | Begin 5.0 implementation |
| 9/29/15 | Complete 5.0 implementation |