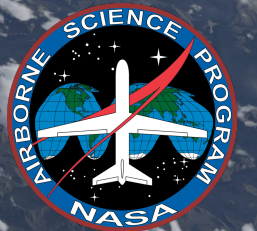


# MTS

The MISSION TOOLS SUITE



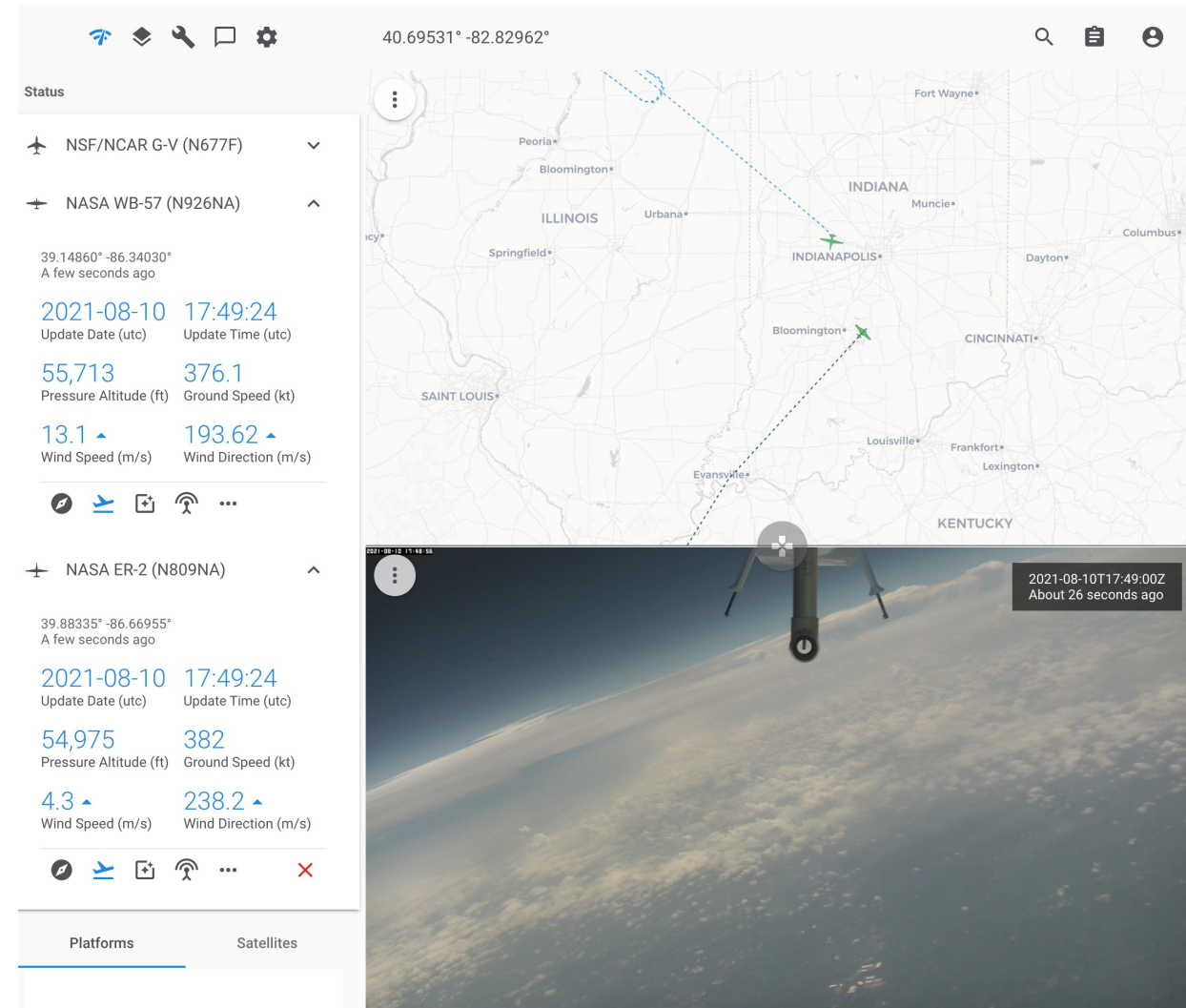
# Mission Tools Suite: About

- The NASA Airborne Science Mission Tool Suite supports the Airborne Science Program (ASP) and the NASA Science Mission Directorate (SMD) Earth Science Division by providing a suite of web-based capabilities to support Airborne Science Missions.
- ASP Mission Tool Suite is the ground complement to the NASA SensorNet project, which is developing the airborne networking infrastructure to enable high speed SATCOM of aircraft parameter data, and instrument data during flight missions.
- The ASP Mission Tools Suite provides a common operating picture for improved situational awareness for all participants in NASA Airborne Science missions from scientists and engineers, to managers, as well as the general public.
- The intent of the system is to encourage more responsive and collaborative measurements between instruments on multiple aircraft, satellites, and on the surface in order to increase the scientific value of the measurements, and improve the efficiency and effectiveness of flight missions.
- The Mission Tool Suite provides a means for visualizing the position of the aircraft and instruments during the course of the mission. Such information is made more useful when compared with or overlaid upon other datasets and model outputs used for mission planning and science data analysis. Additionally, ASP
- Mission Tool Suite facilitates communication between mission team members to enable analysis and discussion of multiple data sources to help plan and execute science missions.



# Mission Tools Suite

- Tactical decision-making and distributed team situational awareness
- Real time position and instrument telemetry ingest for single- and multi-asset campaigns
- Instrument telemetry visualization and quick look product distribution
- Access to low latency satellite, radar, lightning and other meteorological and mission products
- Communication and collaboration tools including document sharing and turn-key aircraft chat solutions



# MTS: Workspaces

The screenshot shows the 'Project' workspace for IMPACTS. The left sidebar contains a 'MISSION TOOLS SUITE' with icons for Projects, Platforms, Satellites, Public Tracker, Telemetry, User Profile, Application, and Help. The main content area features a large blue header with the IMPACTS logo and the title 'Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms'. Below the header is a brief description of the project's objectives. At the bottom, there is a 'Platforms' section displaying two aircraft icons: NASA P-3 (N426NA) and NASA ER-2 (N809NA), both from the National Aeronautics and Space Administration. Navigation tabs for MONITOR, DOCUMENTS, OPERATIONS, MANAGE, and EDIT are visible above the platforms section.

## Landing Page

The screenshot shows the 'IMPACTS Project Operations' workspace. The left sidebar is identical to the landing page but includes a 'Project' section with icons for Project Home, Monitor, Documents, Operations, Manage, Edit, and Dashboard. The main content area is divided into two sections: 'Plans' and 'Quicklooks'. The 'Plans' section lists 'P3 Latest Flight Plan' with a description and update time, and includes '+ ADD PLAN' and 'CONVERT' buttons. The 'Quicklooks' section lists several radar instruments (EXRAD 3, CRS, HIWRAP KU, HIWRAP KA) with their respective update times and includes '+ ADD QUICKLOOK' and 'UPLOAD QUICKLOOK' buttons. Both sections include explanatory text about the products and their usage.

## Operations Page

*MTS projects are organized into workspaces. Workspace members can upload planned flight plans, instrument quick looks, and access other workspace specific content.*

# MTS: Platform Monitoring

- MTS provides global platform monitoring of NASA airborne and spaceborne observation platforms conducting Earth Science research for NASA SMD.
- MTS can be used to monitor real-time instrument status of onboard scientific payloads.

34.45215° -68.99114°

Status

✈ NASA DC-8 (N817NA) ^

21.80082° -71.28359°  
A few seconds ago

2021-08-20 22:43:05  
Update Date (utc) Update Time (utc)

29,982 489.3  
Pressure Altitude (ft) Ground Speed (kt)

3.6 ▲ 297.1  
Wind Speed (m/s) Wind Dir (degrees\_true)

✈ NOAA G-IV (N49RF) ^

34.30250° -72.78850°  
About 6 seconds ago

2021-08-20 22:43:00  
Update Date (utc) Update Time (utc)

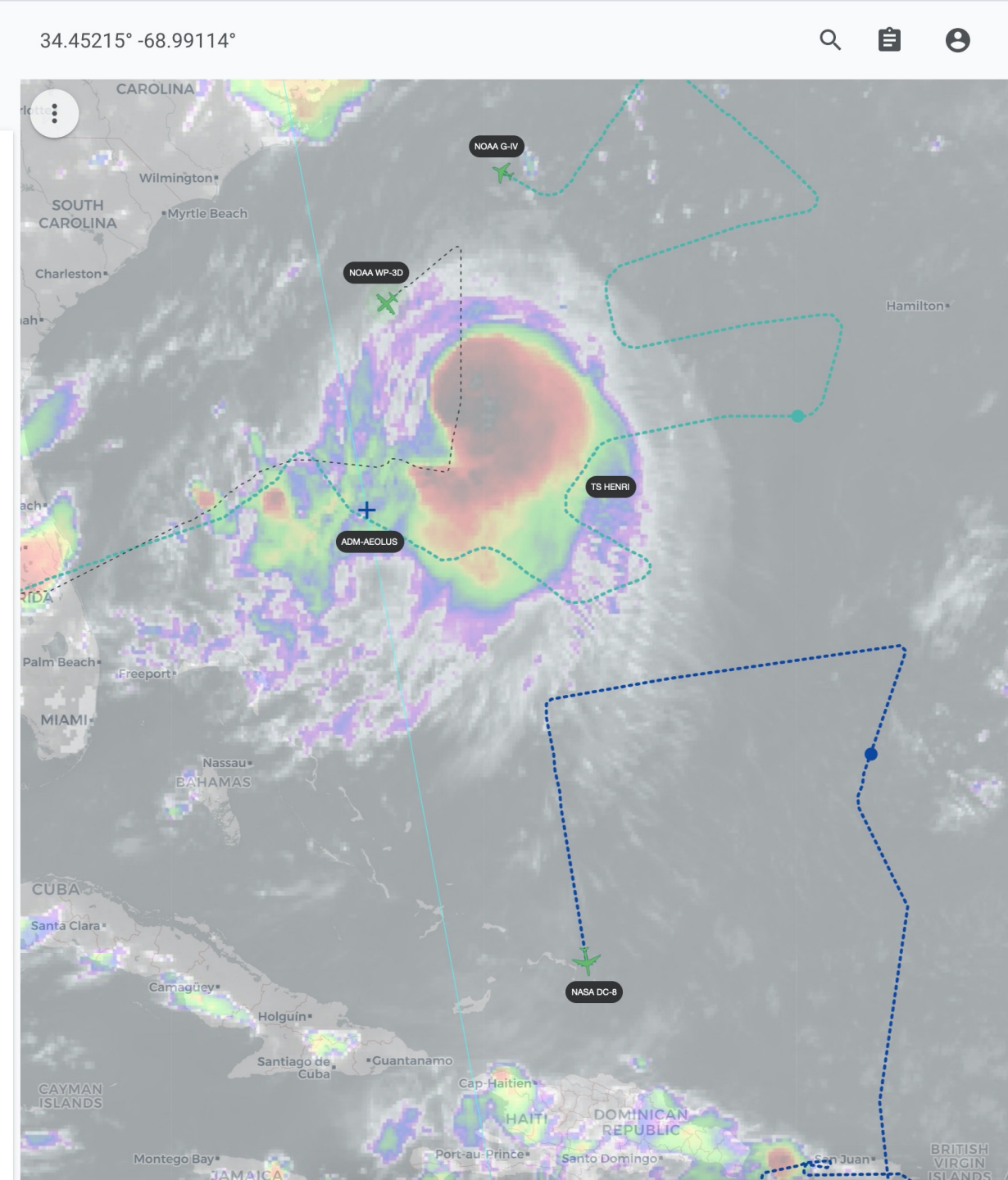
43,862.6 410.7  
Pressure Altitude (ft) Ground Speed (kt)

21.38 ▼ 246.6131 ▼  
Wind Speed (m/s) Wind Direction (m/s)

✈ NOAA WP-3D (N42RF) ^

32.33500° -74.86880°  
About 6 seconds ago

2021-08-20 22:43:01





# MTS: Monitor Customization

**NASA ER-2 (N809NA)**

- Settings
- Marker
- Telemetry
- Telemetry Visualizer
- Ground Track
- Swath
- Distance & Bearing
- Wind Vectors
- Range

Visible

Colors

Render Circle

Mode Distance

Radii (e.g., 10,50,75) Units 50,100,150 Nautical Miles

Bearing values are relative to aircraft heading.

Dashed  Fill

37.11803° -105.16534°

MINNESOTA  
SOUTH DAKOTA  
WISCONSIN  
NEBRASKA  
IOWA  
ILLINOIS  
MISSOURI  
KANSAS  
OKLAHOMA  
ARKANSAS  
MISSISSIPPI  
LOUISIANA  
TEXAS  
LAZY

Lincoln  
Topeka  
Wichita

Products

Available Products

Project Search

Product Collections  
G16 Standard Products

Select Product  
G16, Band 01

All Band #1 (0.47 micron) Visible (Blue Band) data for monitoring aerosol trends ( haze, dust) and air quality monitoring through measurements of aerosol optical depth. Source: Iowa State Mesonet

Selected Products

Views  
Default

Default products view

G16, Band 01

Visibility

Opacity

Order

2020-10-14T18:46:56.021Z About 375 days ago

2020-10-14T18:45:49.411Z About 375 days ago

HIWRAP - KU Real-time (NO QC) on 03/02/2020, 20:25:24UTC

CRS Real-time (NO QC) on 03/02/2020, 17:37:06UTC

Altitude [km]

Time

Uncat. Intensity

Doppler Angle

Status

NSF/NCAR G-V (N677F)

NASA WB-57 (N926NA)

36.30160° -92.44870°  
A few seconds ago

2021-08-17 19:12:46  
Update Date (utc) Update Time (utc)

55,021 374.9  
Pressure Altitude (ft) Ground Speed (kt)

15.6 306.45  
Wind Speed (m/s) Wind Direction (m/s)

NASA ER-2 (N809NA)

36.30214° -92.44823°  
A few seconds ago

2021-08-17 19:12:44  
Update Date (utc) Update Time (utc)

55,800 376.1  
Pressure Altitude (ft) Ground Speed (kt)

3 280  
Wind Speed (m/s) Wind Direction (m/s)

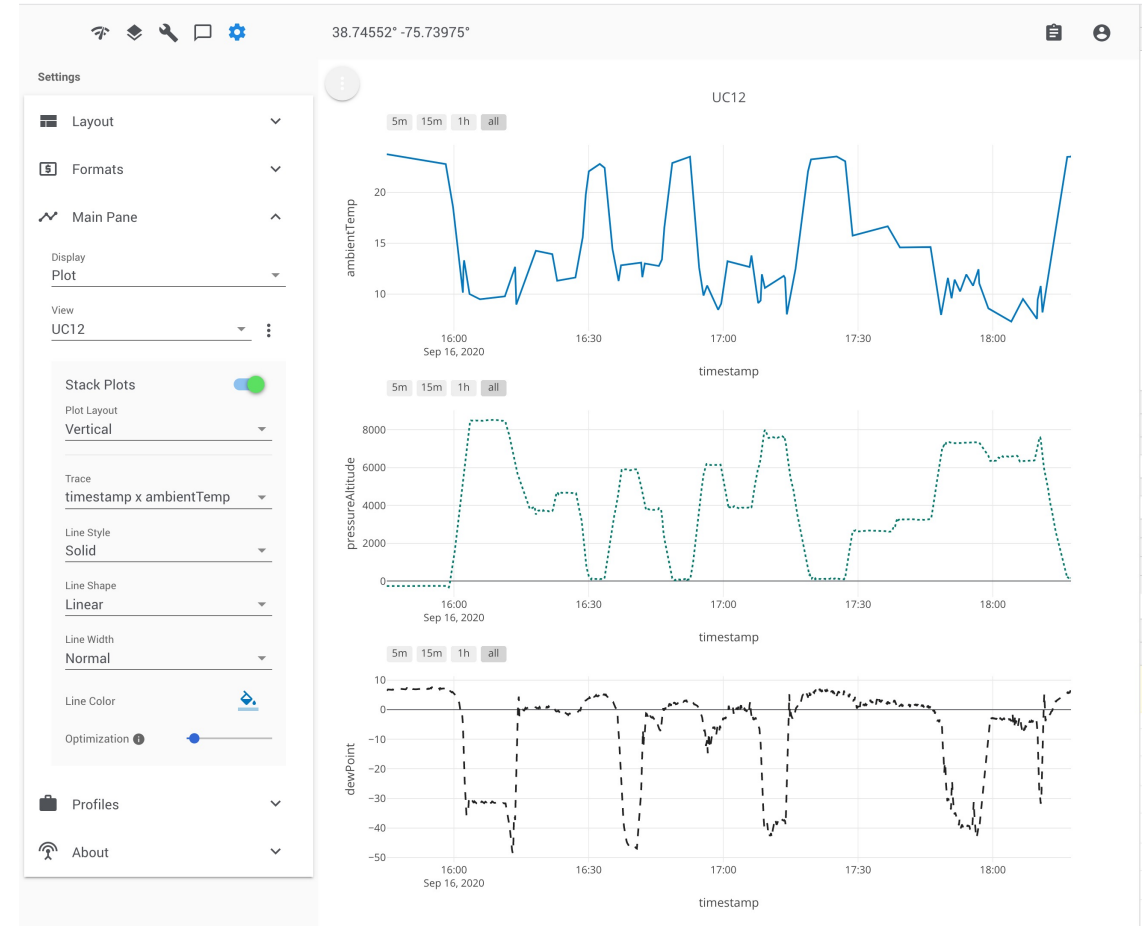
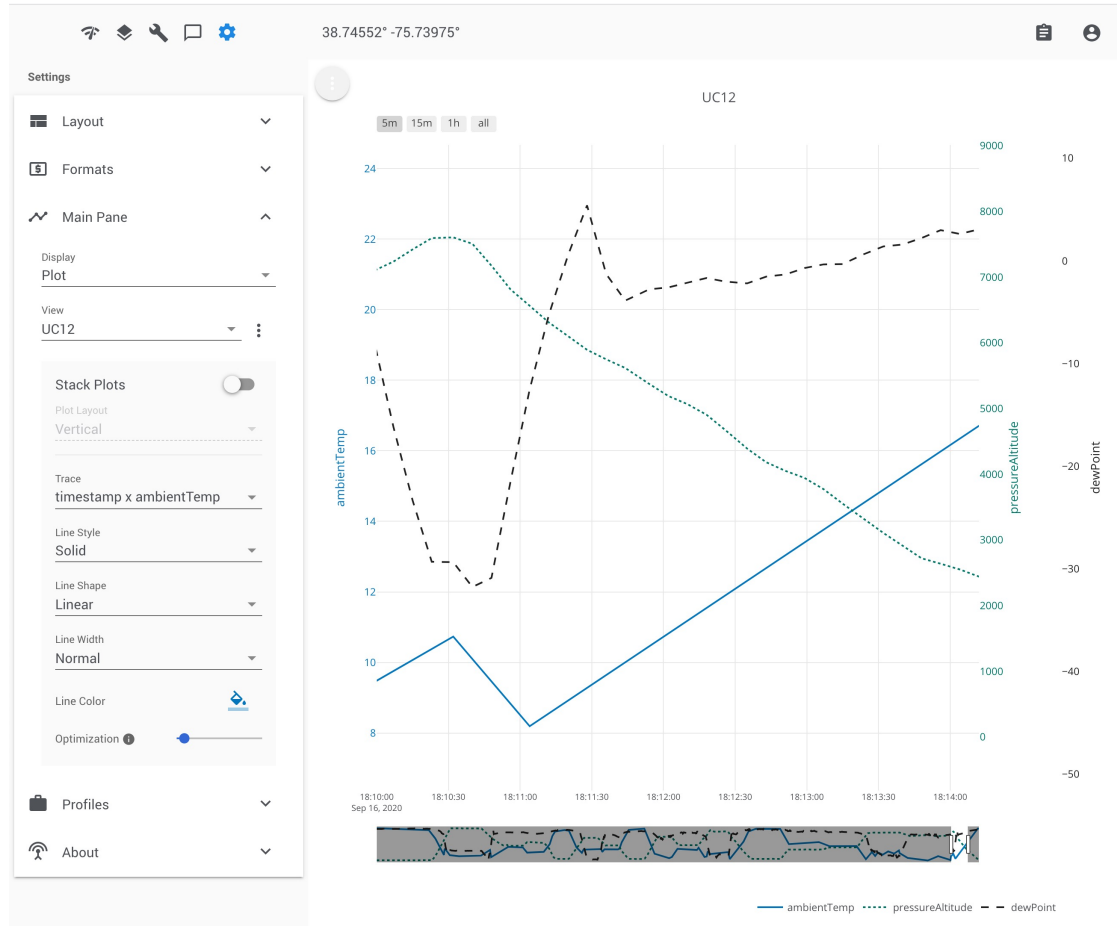
Platforms Satellites

36.40791° -92.44511°

2021-08-17T19:12:02Z About 47 seconds ago

The MTS mission monitor provides Users with many customization and display options. Users can view multiple panes simultaneously to visualize the scientific airspace and monitor key operational information based on their project role.

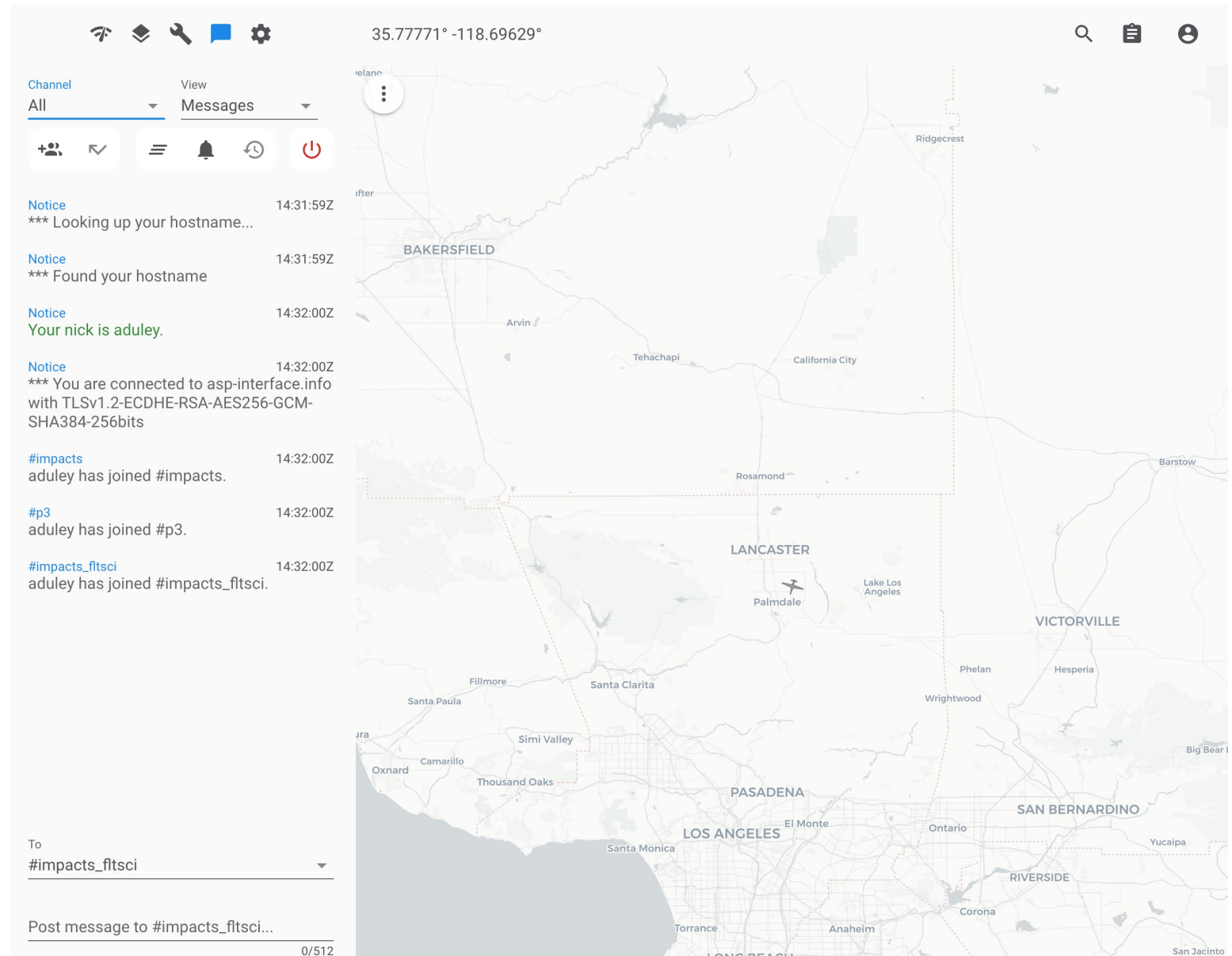
# MTS: Instrument Telemetry



*MTS Users can directly monitor real time aircraft housekeeping status and instrument status packets graphically with a variety of plot options.*

# MTS: Chat

- ASP platforms provide a chat capability that is useful for mission coordination and communication during a flight.
- MTS simplifies chat connectivity for mission participants with a built-in chat client.





# MTS: Operational Tools

Channel: #mts\_dev | View: Messages | Location: 39.06946° -89.06522°

Search: ksf

- KSFO (TAF)**  
KSFO 291124Z 2912/3018 29005KT P6SM SKC FM 292100 29016G22KT P6SM SKC FM 30...
- KSFM (METAR)**  
KSFM 291456Z AUTO 02010KT 10SM CLR 16/06 A2994 RMK AO2 SLP140 T01560061 50001
- KSFO (METAR)**  
KSFO 291456Z 19003KT 10SM SCT200 13/11 A3002 RMK AO2 SLP166 T01330106 52007
- KSFQ (METAR)**  
KSFQ 291455Z AUTO 05008KT 10SM CLR 24/17 A3002 RMK AO2 T02410172
- KSFZ (METAR)**  
KSFZ 291456Z AUTO 02010KT 10SM FEW031 14/07 A2994 RMK AO2 SLP144 6//// T014400...
- KSFY (METAR)**  
KSFY 291455Z AUTO 16003KT 2 1/2SM HZ CLR 21/13 A3006 RMK AO2
- SAN FRANCISCO INTL - KSFO (AIRPORT)**  
GLENN BROTMAN: AIRFIELD OPERATIONS PHONE 650-821-3349 AND FAX 650-821-4670. S...
- ORLANDO SANFORD INTL - KSFB (AIRPORT)**  
TWY K1 CLSD TO ACFT WITH WINGSPAN GTR THAN 80 FT.PAEW ON TRML RAMP WITHIN ...
- TRI-TOWNSHIP - KSFY (AIRPORT)**  
IRRIGATION SPRINKLER SYSTEM OPS SEASONALLY UNDER RWY 31.FOR CD CTC CHICAGO ...
- SANFORD SEACOAST RGNL - KSFM (AIRPORT)**  
WILDLIFE ON & INVOE ABPTCALM WIND PREFERRED BY 32-24 HR.EJEL AVAILABLE WITH 0/512

Selected Tools: Distance: 119 @ 617.9 km °

Text Search | Geospatial Search

Units: Kilometers

Snap Points to Grid

Snap Resolution (Degrees): 0.25

Hide Line Labels

Hide Point Labels

Point	Latitude	Longitude
P0	38.7500°	-92.2500°
P1	37.0000°	-92.7500°
P2	36.0000°	-91.2500°
P3	37.2500°	-89.0000°

Distance: 617.9 km | Bearing: 119 °

*In addition to real time monitoring, MTS provides several tools to obtain the latest airspace and meteorological information, in addition to tools useful for geospatial measurement.*

# For More Information

- Please contact Aaron Duley for more information about using the Mission Tools Suite (MTS) for your airborne campaign.