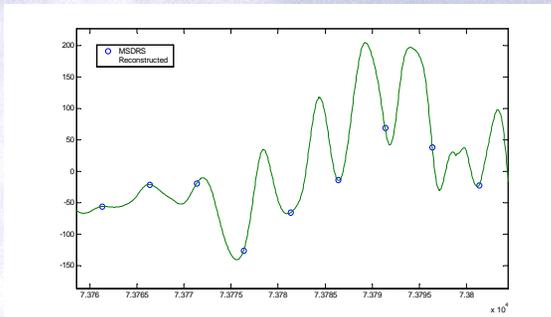


# Aeromechanics Safety Support Team

*Providing Aeromechanical Engineering Resources and Support for Aircraft Incidents and Mishap Investigations*





# Mission

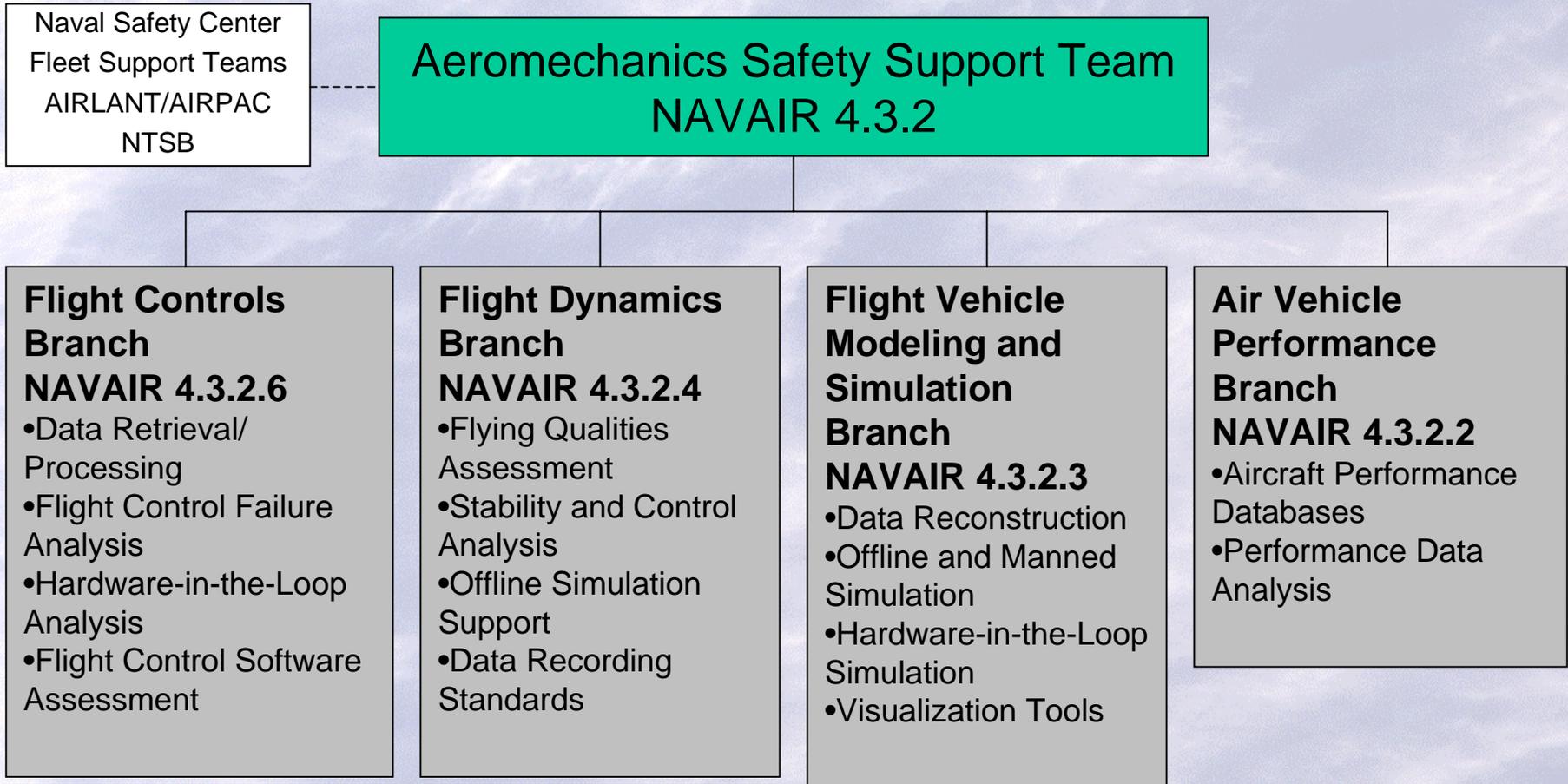
- To provide efficient, high quality aeromechanical engineering support for aircraft incidents and mishap investigations
- To provide a clear entry point and path to the fleet for acquiring assistance in the fields of flight controls, flight dynamics, air vehicle performance and air vehicle simulation



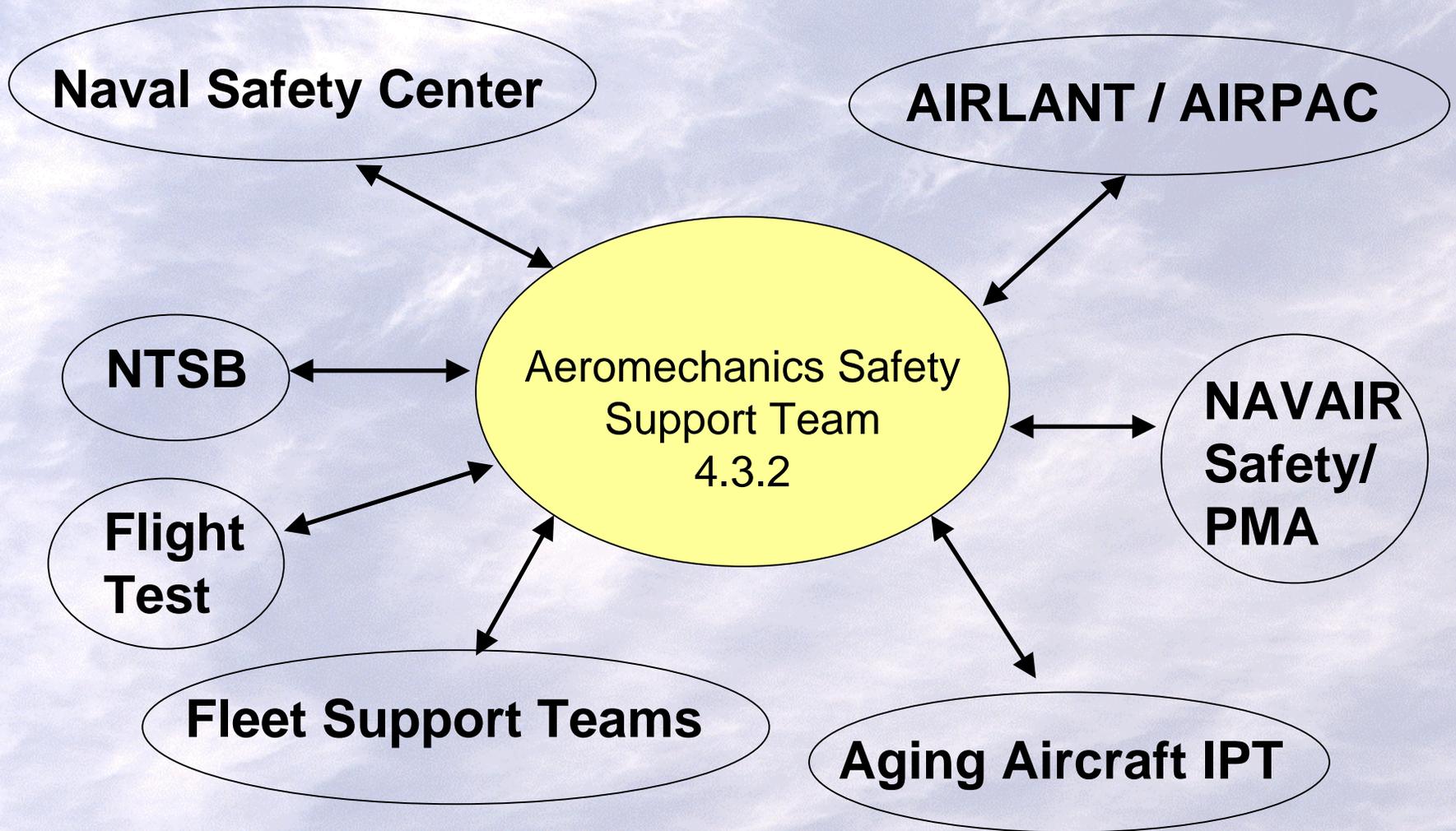
Coordinating with Depots/Fleet Support Teams for Material and Component Evaluations



# Organizational Chart



# External Components





# Available Resources

- Manned Flight Simulation Lab
- Flight Dynamics Lab
- Engineering Analysis Tools
  - Engineering Simulation
  - Flight Path Reconstruction
- Flight Control Failure Analysis
- Air Vehicle Performance Databases

# Manned Flight Simulator Lab

## 6 DOF Motion Platform

- +/- 1.5 Gs
- Rediffusion WIDE display system
- 40° V x 200° H field-of-view
- Collimated
- 5 channels
- Projected HUD



- High fidelity Fixed Wing & Rotary Wing Simulation
- High fidelity visual databases
- High fidelity ship visual models
- High fidelity shipboard environment landing aids
- Real-time high fidelity airwake models
- FCC Hardware in the loop capability
- Standard NAVAIR airframe simulation host software (CASTLE)
- Test Team Crew Coordination Capability (MFS-Telemetry Station Link)
- 6 DOF cockpit motion base capability
- M2DART, SEOS Panorama Collimated Displays
- SEOS Prodas 22-ft partial dome
- Cockpit design, build and integration shops
- Roll-in/Roll-out cockpits
- Classified/Unclassified capabilities

MMH High Fidelity Cockpit



F/A-18 C/D High Fidelity Cockpit



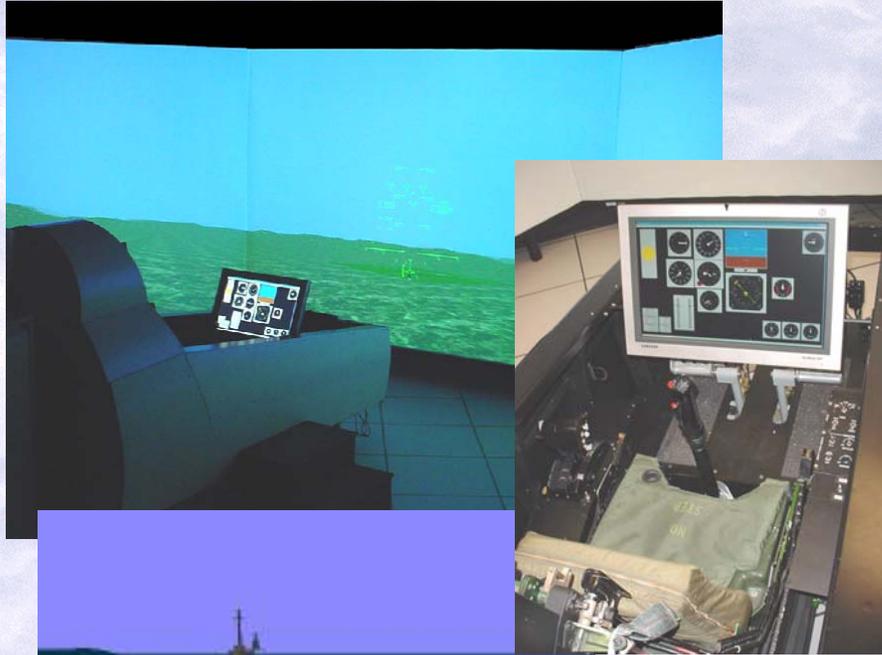
F-14B/D High Fidelity Cockpit



M2DART Platform



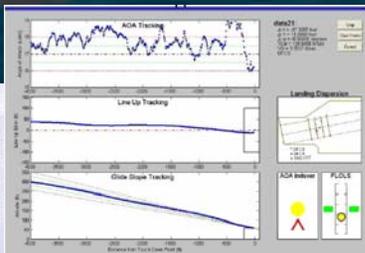
# Flight Dynamics Lab



Generic Cockpit



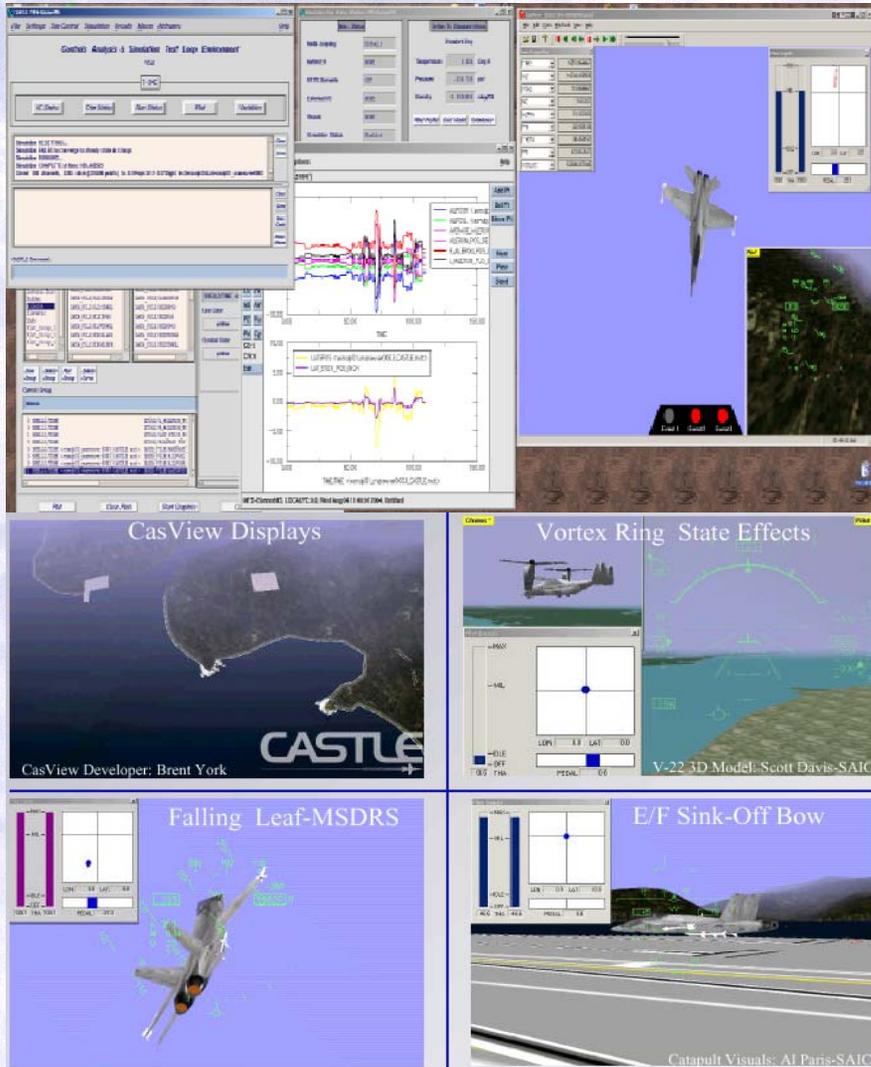
Digital Strip Charts



CVS Approach Analysis Tool

- Fixed base generic fixed wing cockpit
  - EA-6B Prowler
  - F-18C/D Hornet
- EA-6B DFCS Hardware-in-the-Loop Capability
- Carrier approach analysis tool
- SCT stick & throttle control loaders
- Everest Digital strip chart recorders
- Simulink dials and gauges block set for cockpit displays
- Standard NAVAIR airframe host software (CASTLE)
- CASView OTW 3-Screen 180 deg Field Of View capability
- PC based architecture

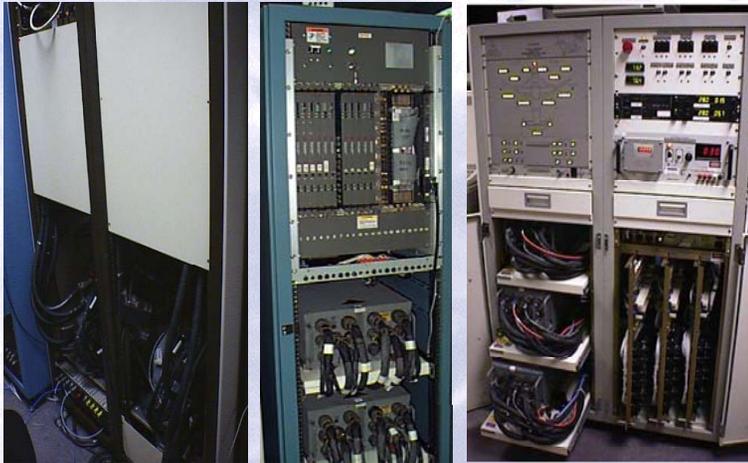
# Engineering Analysis Tools



- CASTLE airframe simulation software
  - Extensive plotting tool suite
  - Linear model extraction
  - Overdrive sim with flight data
  - Multi-Platform support
  - Portable/Desktop PC capability
  - Matlab/SimuLink Interfaces
  - FlightLab Interface (Planned)
- Flight Path Reconstruction
  - CASTLE/Matlab Tool Suite
    - Flight Data Recorder
    - Radar Data
  - CASView 3-D Visualization
    - Video Generation
    - Simultaneous Display
      - Trajectory/Dynamics
      - Pilot Controls/Surfaces
      - HUD/MFD Data
      - Cautions/Warnings

CASView 3-D Displays

# Flight Control Analysis



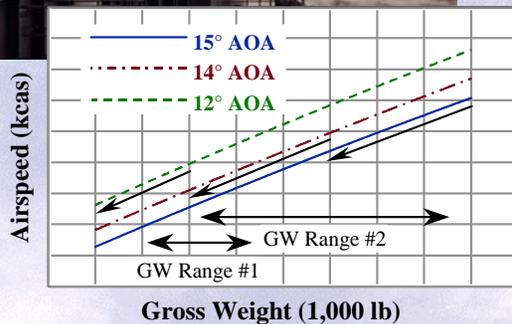
FCC HWIL Test Stations

- Flight Control Computer Hardware Testing and Analysis - Hardware-In-the-Loop (HWIL) test stations
  - Software logic and BIT checks
  - Simulate Sensor/Actuator/FCC failures
  - Overdrive FCCs with actual flight data
  - Multi-Platform support (F-18, V-22, F-14)
- Portable/Desktop PC capability
  - Visualization tools for studying FCS displays
  - Control law analysis
  - CASView FCS plug-ins
- Maintenance/Subsystem Analysis
  - Review of FCS maintenance logs and files.
  - Searchable database for F/A-18E/F
  - FCS Data Retrieval tools



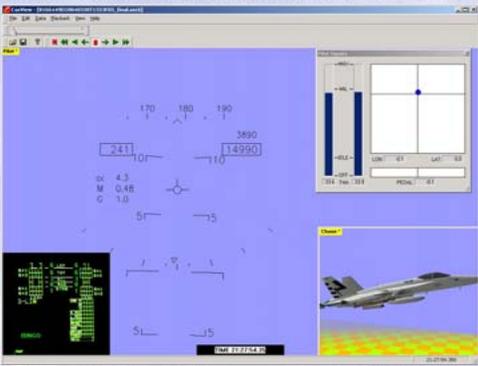
FCS Subsystem Analysis

# Air Vehicle Performance



- Source for Aerodynamic Performance Data for All Navy Aircraft
- Proven performance prediction methods
  - 2 and 3 Degree-of-Freedom Time Integration Prediction Codes for Takeoff, Landing and Launch and Recovery
  - Point Performance Codes for Climb Cruise, Maneuver and Descent
- Thermodynamic Engine Models
- Failure Mode Analysis Capability

Date	Flight	Leg	Aircraft	Altitude	SO	WOB	WOB
24-2-01-01	8	5	F18B	4210	89.7	39.4	352.8
24-2-01-01	8	2	F18B	4210	39.4	21.2	354.0
24-2-01-01	8	3	F18B	4210	102.9	21.0	354.8
24-2-01-01	8	4	F18B	4210	107.9	20.4	355.0
24-2-01-01	8	5	F18B	4210	1040	21.3	354.8
24-2-01-01	8	7	F18C	3110	1040	22.1	357.0
24-2-01-01	8	8	F18B	4210	1040	21.1	355.8
24-2-01-01	8	9	F18C	3110	107.9	20.4	357.4
24-2-01-01	8	10	F18C	3110	105.4	19.0	360.0
24-2-01-01	8	11	F18B	4210	105.4	19.2	357.7
24-2-01-01	8	12	F18C	3110	107.9	18.5	355.0
24-2-01-01	8	13	F18C	3110	105.4	21.1	364.4
24-2-01-01	8	5	F18C	3110	131.9	19.0	364.4
24-2-01-01	8	2	F18C	3110	132.4	19.4	365.8
24-2-01-01	8	4	F18C	3110	131.1	19.2	363.8
24-2-01-01	8	5	F18C	3110	140.9	19.1	362.4
24-2-01-01	8	6	F18C	3110	140.7	19.4	362.4
24-2-01-01	8	7	F18C	3110	141.5	18.4	362.3
24-2-01-01	8	8	F18C	3110	142.1	19.4	367.0
24-2-01-01	8	9	F18C	3110	142.0	19.3	354.8
24-2-01-01	8	10	F18C	3110	142.0	19.4	355.0
24-2-01-01	8	11	F18C	3110	143.0	21.2	364.4
24-2-01-01	8	12	F18B	4210	143.6	19.7	352.2
24-2-01-01	8	13	F18C	3110	150.0	19.4	361.4
24-2-01-01	8	14	F18C	3110	131.1	18.8	350.2
24-2-01-01	8	15	F18C	3110	133.6	19.2	357.4
24-2-01-01	8	16	F18C	3110	131.9	18.8	343.9
24-2-01-01	8	17	F18C	3110	132.1	19.2	350.2



# Aeromechanics Safety Support Team



*If you are part of an AMB and believe that this type of support is what you need to assist in your investigation,*

*Contact NAVAIR by using the Toll Free "One Touch" Support for the Fleet phone number:*

*1-877-41-TOUCH or 1-877-418-6824*

*(then press option 2 for aviation support)*

*Ask to be put in contact with someone from NAVAIR AEROMECHANICS*

*AIR-4.2.3*

