



# Science Operations Center Requirements

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# SOC Characteristics



- **Science Operations Center (SOC) Is Part of the FAME Observatory Ground Segment**
- **SOC Is Located at USNO-DC**
- **SOC Has Three Primary Functions/components**
  - **Operate the Instrument**
  - **Operate a First Look and Troubleshooting Pipeline**
  - **Operate the Data Analysis & Reduction Pipeline**



# SOC Requirements



- **Monitor the On-Orbit FAME Observatory, Particularly the Instrument**
- **Operate the On-Orbit FAME Observatory Instrument**
- **Provide On-Orbit Mission and Instrument Planning**
- **Provide Near Real-time Analysis of FAME Observatory Science Data Employing a First Look and Troubleshooting Pipeline**
  - **Confirm Stellar Image Detection, Monitor Image Quality, Determine Satellite Attitude**
  - **Science Data Anomalies Trigger Recovery Activities in Cooperation With the MOC**
- **Receive From MOC All S/C Data Streams Relevant for Instrument Operations and Science Data Analysis**
- **Archive Data Streams Along With Critical Intermediate Products of the Astrometric/Photometric Data Analysis Pipeline**
- **Staffed Normal Working Hours, but With Auto Anomaly Call-Out**



# SOC-Data Analysis/Processing

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# SOC-Data Analysis Organization



- **Pipeline Data Analysis Group Established Nov 01 (George Kaplan, USNO-DC)**
  - **Pipeline Algorithm Development (George Kaplan) (5 FTE, 3 PT)**
  - **Production Code Team (Software Project Manager, TBN)**
- **Data Analysis Simulator Group Established Nov 15 (Jeff Pier, USNO-Flagstaff) (Personnel 5 NOFS, 1 DC)**
- **1st Versions of Developments Plans for Both the Pipeline and Simulator Are Available on the Web Site**



# SOC-DA Requirements



- **Produce Mission Science Deliverables: Operate an Astrometric/Photometric Data Reduction Pipeline**
- **Test/verify Correct Operation of the D-R Pipeline: Develop an Astrometric/Photometric Mission Data Simulator**
- **Provide the FAME Science Deliverables:**
  - **Input Catalog – the Basic List of Targets for the FAME Mission – Positions to 0.1 Arcsecond – 100,000+ Grid Stars – Carried On-board the FAME Instrument for Real-time Use**
    - **Delivered to the FAME Science Team for Review 1 Year Prior to Launch**
    - **Reprogrammable After Launch**
  - **Science Catalog – Astrometric & Photometric Parameters of the Stars Observed During the FAME Mission**
    - **Final Fame Catalog Meets the Accuracy Requirements of the Fame Sci. Req. Doc.**
    - **1st Fame Catalog Delivered 1 Calendar Year After the End of the Baseline Mission**
    - **2nd FAME Catalog Delivered 1 Calendar Year After the End of the Extended Mission**



# Phase B SOC-Data Analysis Milestones



- **01 Nov 00 Estab. Pipeline Algorithm Dev. Team**
- **15 Nov 00 Estab. Simulator Dev. Team**
- **15 Dec 00 FAME Pipeline Dev. Plan Document (1st Release)**
  - **02 Jul 01 Final Version**
- **15 Dec 00 FAME Data Simulator Dev. Plan Document (1st Release)**
  - **02 Jul 01 Final Version**
- **01 Mar 01 Prototype Simulator**
- **02 Apr 01 Prototype Pipeline**



# Data Analysis Milestones



- **02 Apr 01 Pipeline/simulator Studies Begin Using Prototype Pipeline/Simulator**
  - **Report 01 Jun 01**
- **02 Apr 01 S/W Project Manager On-board**
- **02 Jul 01 Pipeline Code Development Plan Document Delivered**
- **01 Aug 01 SOC Development Plan Document Delivered**
- **01 Aug 01 Mission Science Data Analysis Document Delivered**
- **03 Sep 01 Establish Pipeline Code Development Team**