GUVI POC

Data Processing Software

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Documentation

- **Software Requirements Specification**
  First draft released 12/20/96
- **Software Development Plan**
  Outline released 1/3/97

Activities to Support PDR

- Incorporate comments to draft SRS
- Release documents:
    - Software Requirements Specification
    - Software Development Plan
    - POC Interface Control Document
    - Preliminary Software Design□
    - Software Test Plan
- Perform top-level design

Data Processing POC

- Requirements defined in Software Requirements Specification

- Produce Level 1 and Level 2 data products

- Distribute data to team members to support generation of Level 3 and Level 4 data products

- Provide user interface to data products

- SSUSI requirements in addition to:

  - Provide catalog of data products

  - Provide survey products

- Data Processing POC designed to reuse SSUSI algorithms and code

GUVI Data Product Definitions

Level 0: Unprocessed instrument data at full resolution that has been separated by instrument or subsystem.

Level 1A: Unprocessed instrument data at full resolution, time-referenced and annotated with ancillary information including radiometric and geometric parameters.

Level 1B: Level 1A data processed to sensor units (e.g. Rayleighs/ bandpass).

Level 2: Derived geophysical variables at the resolution of retrieval.

Level 3: Derived geophysical variables mapped on a uniform, earth referenced, space-time grid.

Level 4: Model output or results from analysis of lower level data (e.g. variables derived from multiple measurements).

Data Product Size Estimates

Level 0 Data: ~90 MBytes/day

Level 1A Data: ~160 MBytes/day

Level 1B Data Products:

    Disk: ~270 MBytes/day

    Limb: ~20 MBytes/day

    Spectrograph: ~20 MBytes/day

Level 2 Data Products:

    Disk: ~8   MBytes/day

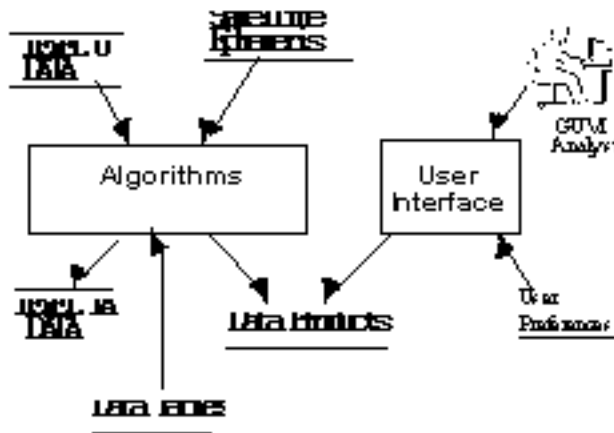   Limb: ~10   MBytes/day

    Overlays: ~5   MBytes/day

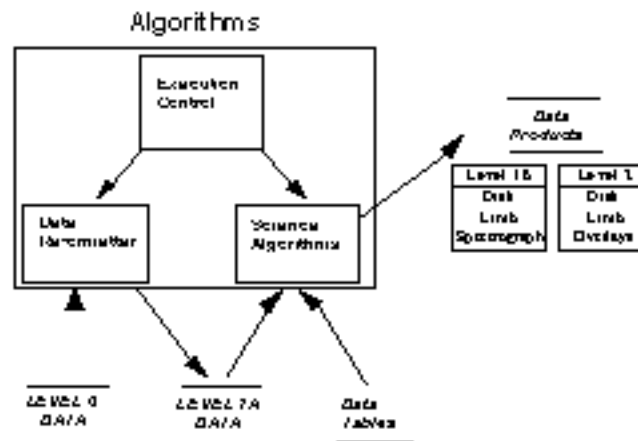Catalog: ~2   MBytes/day

Browse Products: ~30 MBytes/day

GUVI versus SSUSI

- No photometer
- Different altitude
- Modified color definitions
- Modified lookup tables
- Full orbit calculations as opposed to 1/4 orbit calculations
- SSUSI had no catalog requirements
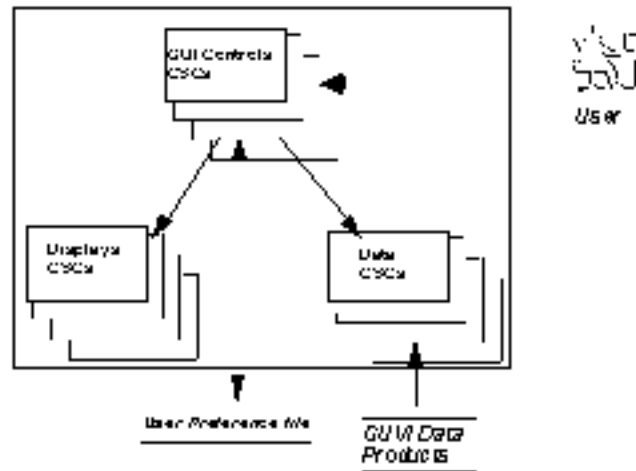- SSUSI had no survey product requirements

GUVI Top-Level Design

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Algorithms
CSCI

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Algorithms

Execution Control

Data Reformatter

Science Algorithms

Data Products

Level 1B
Disk
Limb
Spectrograph

Level 1
Disk
Limb
Overlays

LEVEL 0 DATA

LEVEL 1A DATA

Data Tables

User Interface CSCI

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User Interface Requirements

- Graphical displays of GUVI data products

- Display graphical overlays

- Allow user to:

    - Select GUVI data products

    - Display strip charts of selected engineering parameters for up to the previous month

    - Define display preferences and startup configurations

    - Select various map projections and to select a viewing position

    - Overlay uncertainties for any data product

    - Select orbital overlays from files and plot

User Interface Displays

Graphical Overlays

- Geodetic & geomagnetic coordinate reference
- Continental outlines
- Day/night terminator
- Orbit track & swath
- Uncertainty contours
- Auroral boundary
- Ground sites
- Another satellite groundtrack
- Local solar time
- Solar zenith angle
- Data region (day, night, auroral)

Survey Products

- Limb images
- Disk images
- Calibration images
- Solar index by position and time
- Geophysical parameters, Kp, Ap, Dst, etc. by position and time
- Instrument state, health and data quality report
- Other instrument state

Catalog Requirements

- Support MDC science product catalog
- Access to MDC catalog
    - Satellite/Ephemeris
    - Solar and geomagnetic indices
    - NMC data
    - Other instrument data
    - Other ground based data
- Internal GUVI catalog
    - GUVI team access only
    - General access

GUVI POC Interfaces

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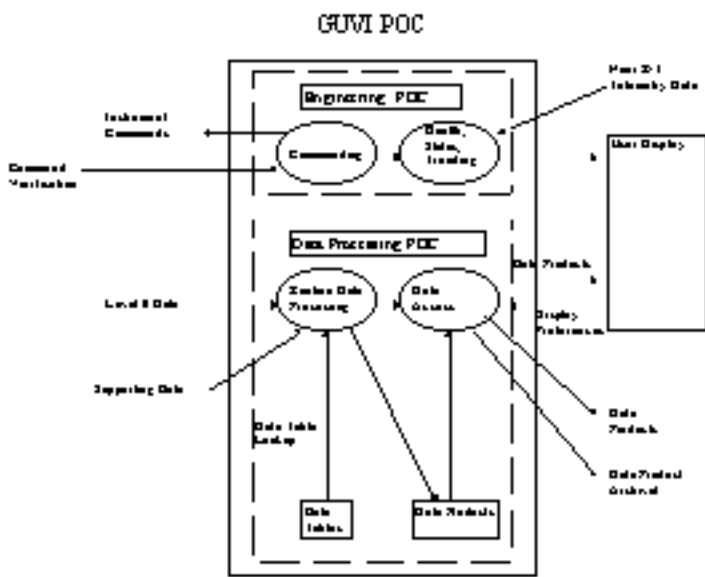
MDC Interfaces

- Receive near real-time data from MDC

- On-line access to Level 0 data via playback from MDC

- Receive auxiliary information such as command history and ephemeris data from MDC

- Receive predicted orbit information from MDC

- Receive supporting data (solar & geomagnetic indices) from MDC

- Provide MDC with information and access to all Level 1 - Level 4 data products

- Provide MDC with planned instrument mode configurations

- Deliver Level 1 - Level 4 data products 3 times during mission for archive

- Deliver K-12 products to MDC

Required TIMED Data

For Level 1 and 2 Data Products:

- **Solar and Geomagnetic Indices**
- **Satellite Attitude/Ephemeris - predicted and as flown**

Required TIMED Data - contd

For Level 3 and 4 Data Products:

- TIDI
  - Winds
  - 630-nm radiance
- SEE
  - Solar Spectrum
- Ground Based Data
  - Incoherent scatter radar
  - JPL Total Electron Content (TEC)
  - Ionosondes
  - Magnetometer Chain Data
  - All sky camera images