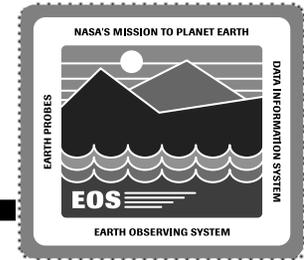


PAS Configuration Tools

Steve Pawlish

17 October 1995

Configuration Tools Overview



Tools for the Initialization and Maintenance of the User-defined Components of the Planning and Scheduling Software

Activity Definer

- Defines command macros used in scheduling

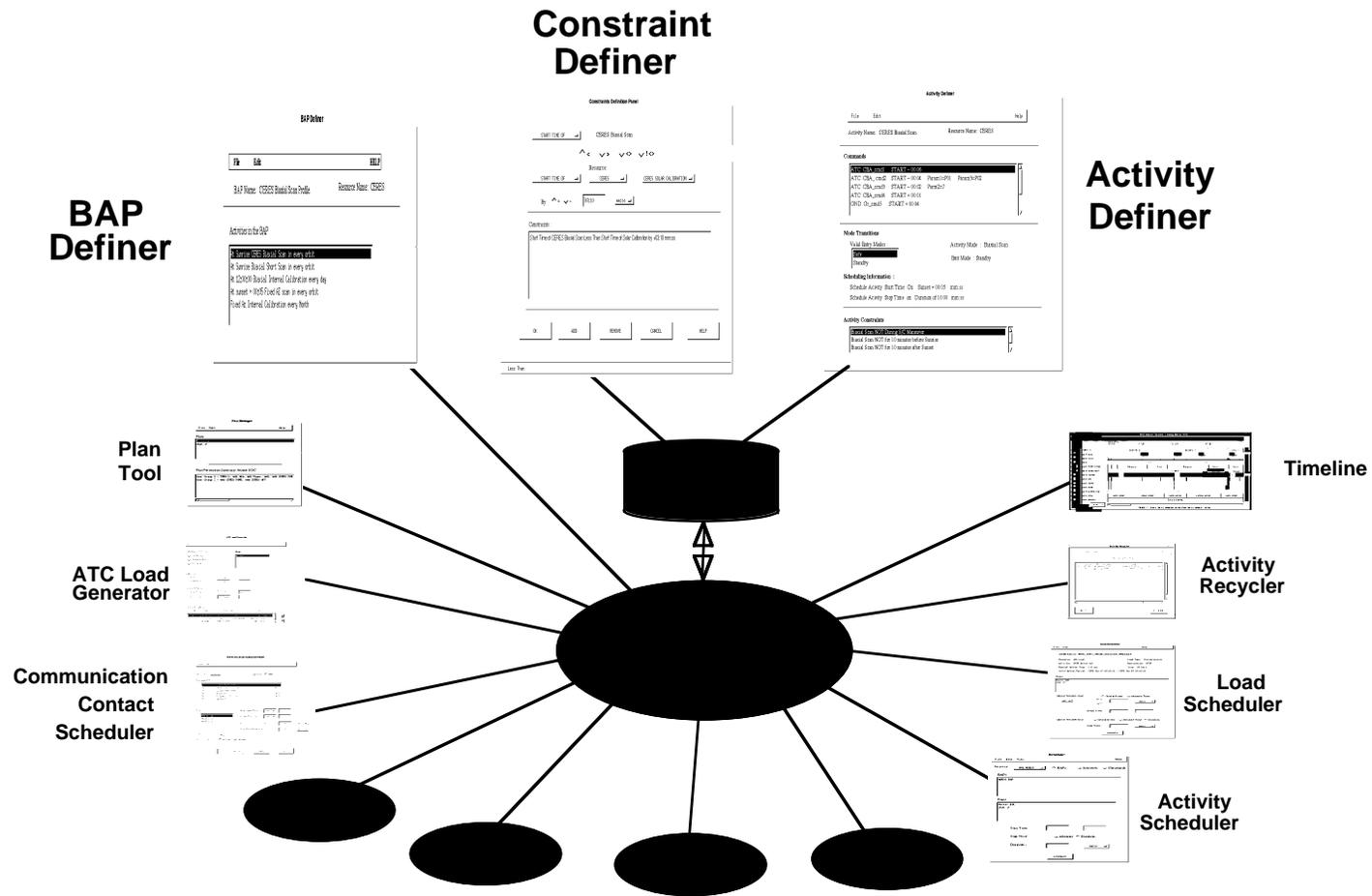
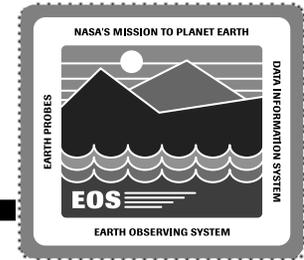
Baseline Activity Profile Definer

- Defines groups of activities used to simplify scheduling

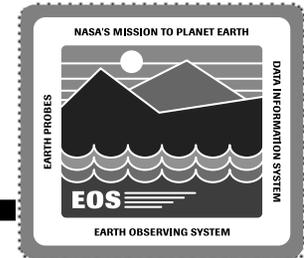
Constraint Definer

- Allows users to specify scheduling constraints related to an activity

Configuration Tools



Activity Definer Design



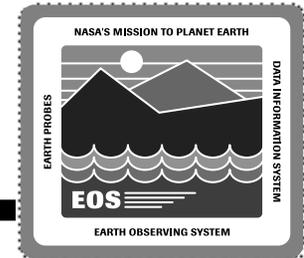
Defines Activities Containing

- One or more commands
 - Time ordered
 - Offset from activity start or stop time
- Default parameters
 - Command parameters
 - Activity parameters (power and data volume consumption)
- Mode transitions caused by the activity's execution
 - Required for mode level constraint checking

Approved Activity Definitions Stored in FOS Project Database

- Activity parameter limits checked for health and safety
- Activities tested in test database prior to approval
- Command level constraint checks performed on definition
- Used later by P&S activity scheduler process

Activity Definer Display



Activity Definer

File Edit Help

Activity Name: CERES Biaxial Scan Resource Name: CERES

Commands

ATC CBA_cmd1	START - 00:06		
ATC CBA_cmd2	START - 00:04	Param1=P01	Param3=P02
ATC CBA_cmd3	START - 00:02	Param2=7	
ATC CBA_cmd4	START + 00:01		
GND Gr_cmd5	START + 00:04		

Mode Transitions

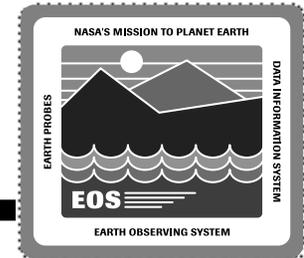
Valid Entry Modes :

Safe	Activity Mode : Biaxial Scan
Standby	Exit Mode : Standby

Activity Constraints

- Biaxial Scan NOT During S/C Maneuver
- Biaxial Scan NOT for 10 minutes before Sunrise
- Biaxial Scan NOT for 10 minutes after Sunset

BAP Definer Design



Defines Baseline Activity Profiles (BAPs)

- Repetitive sequence of activities
 - Define normal operations of instrument or S/C subsystem
- Used to simplify scheduling

Period for Repetition of Activities in a BAP Determined By

- Events (e.g. Sunrise, Sunset)
- Time (e.g. Every 2 Days at 01:00)

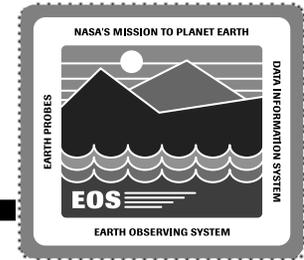
Uses Activities Defined in Project Database

- Entered via Activity Definer
- Default parameters may be modified in BAP

BAP Definition Stored in FOS Database

- Activity parameter limits checked for health and safety
- Used later by activity scheduling process

BAP Definer Display



BAP Definer

File

Edit

HELP

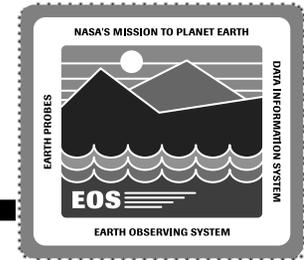
BAP Name: CERES Biaxial Scan Profile

Resource Name: CERES

Activities in the BAP

```
At Sunrise CERES Biaxial Scan in every orbit
At Sunrise Biaxial Short Scan in every orbit
At 12:00:00 Biaxial Internal Calibration every day
At sunset + 00:05 Fixed AZ scan in every orbit
Fixed Az Internal Calibration every Month
```

Constraints Overview



2 Types of Constraint Checking

- Activity level (checked by PAS)
- Command level (checked by CMS)

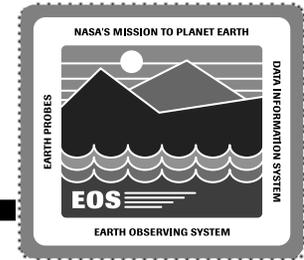
Constraint Checks are Performed During

- Activity defining (command level)
- Scheduling (activity level)
- ATC load generation (command level)

3 Types of Activity Level Constraint Checking

- Instrument and S/C subsystem mode transitions
- Algorithmic constraints
 - Shared resources consumption (e.g. power and SSR buffers)
 - Resource specific constraints (e.g. HGA slew limitations)
- User-defined temporal constraints

Constraint Definer Design



Defines User-defined Temporal Constraints

- **Activities related to activities, events or modes**
- **Supports basic temporal constraints**
 - **Before, after, during, contains**
 - **Negation (e.g. not during)**
- **Provides distinction between hard and soft constraints**

Custom Design Extensible to New Constraint Types

- **Generic constraint checker**
- **Specialized constraints derived from common base class**

Constraints Stored in FOS Database

- **Evaluated later during interactive scheduling**

