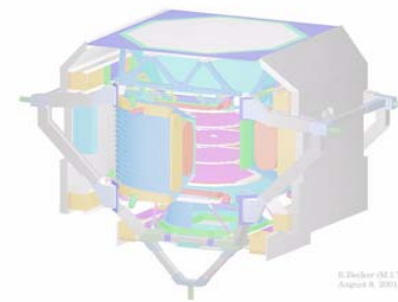


**Title**

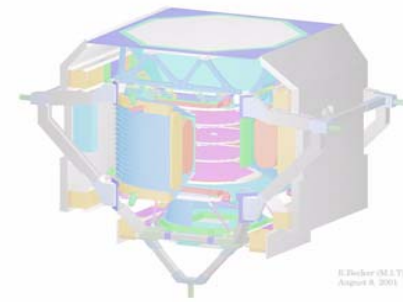


# **TReKGate Concept**

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**PADSOF, Inc**

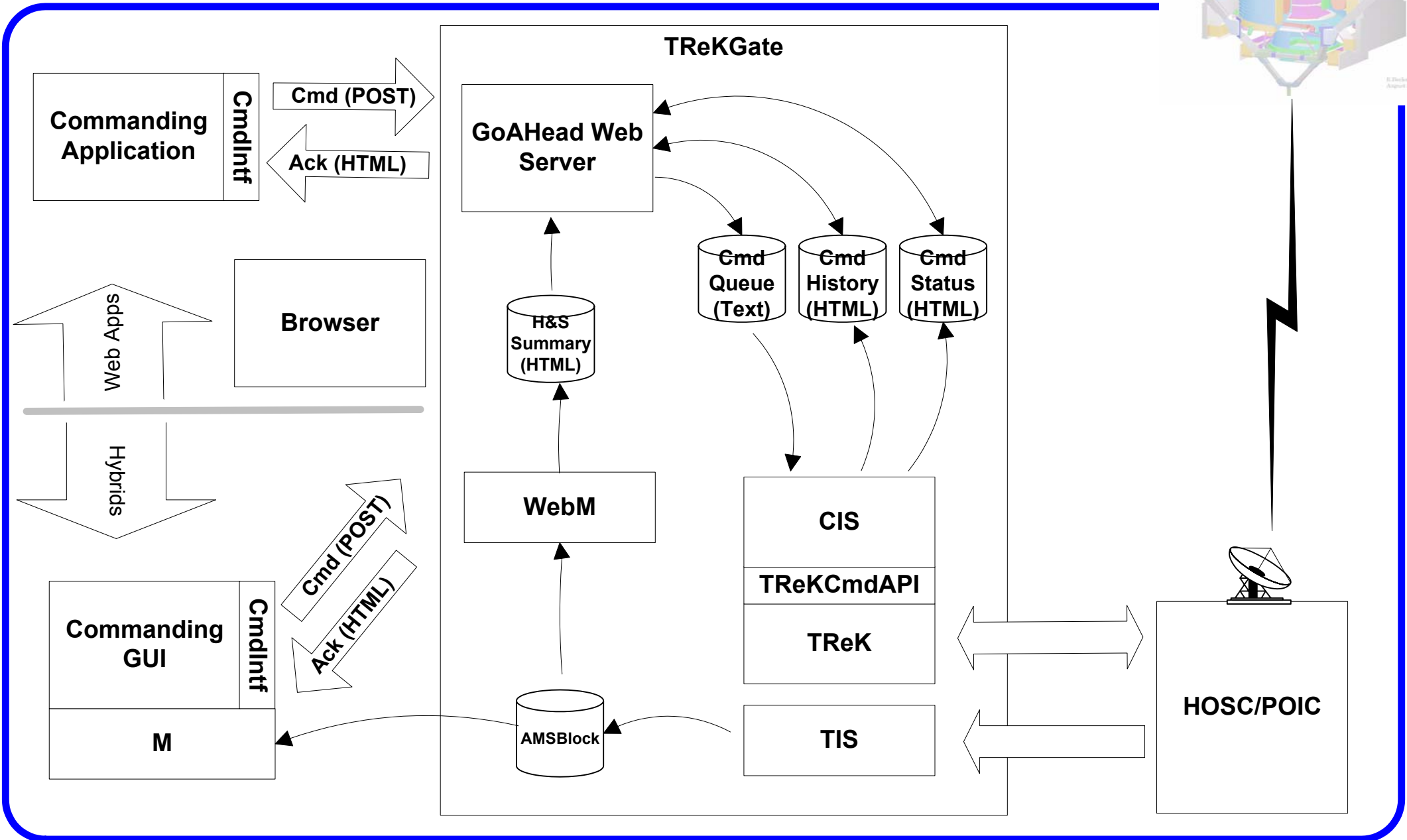
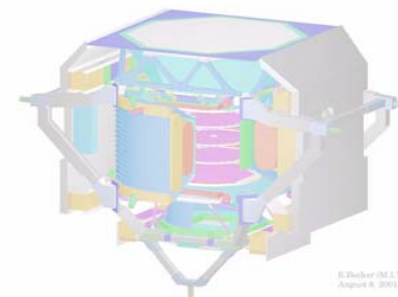
**CERN - July 2003**

# Purpose

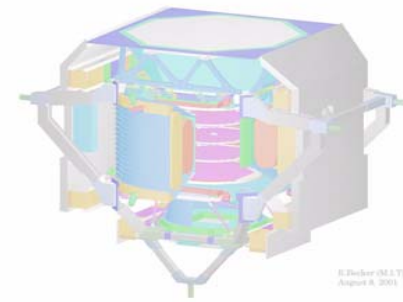


- ❑ Provides the point of integration between MSFC based systems and AMS-02 provided ground systems for commanding and housekeeping data.
- ❑ Acts as a server to accept commands from various AMS collaboration software.
- ❑ Provides command queuing and processing to meet ISS program requirements.
- ❑ Provides command status and history information.
- ❑ Provides web based management reports of current and historical states of AMS-02.
- ❑ Serves as the marshalling point for AMS-02 near real-time housekeeping data.
- ❑ For "simple" operations - commands and status information via a web interface.
- ❑ For "complex" operations - provides the infrastructure to monitor housekeeping data and submit and monitor command sets.

# Block Diagram

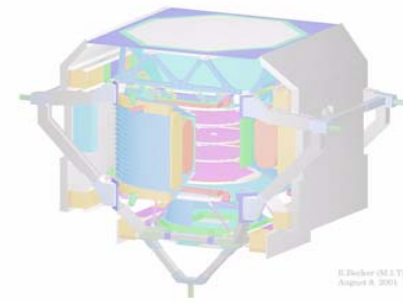


# GoAhead



- ❑ GoAhead is an "open source code" free web server targeted for embedded environments.
- ❑ Operates in either LINUX or W2K environment
- ❑ Supports Active Server Pages (ASP). This allows simple text macro substitution within pages being served.
- ❑ Supports "in process" forms handling. Does not require a task to be spawned.
- ❑ Supports Common Gateway Interface (CGI) allowing spawned tasks.
- ❑ Is designed to be extensible. Code can easily be added to:
  - Process our own ASP macros.
  - Process our own web forms.
  - Process our own types of POSTs.

# Command Flow



## ❑ Commanding Application or Browser

- Constructs a "Command Set"
- Submits the Command Set via HTML POST as a parameter (with optional "editing parameters (FBI)" to set values)
- Accepts command status report and optionally tracks command progress

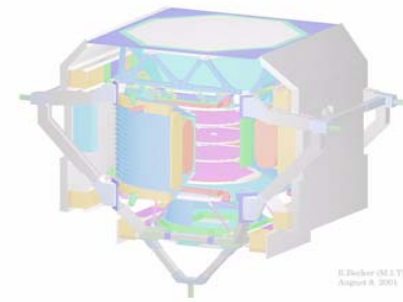
## ❑ GoAhead Web Server

- Fields the POST request
- Assigns command tracking number and enters command set into the command FIFO (simple text file).
- Creates an entry in the history file (an HTML format transaction report of all command activity)
- Creates initial command set status (in HTML format) and returns as post results

## ❑ Command Interface Server (CIS)

- Looks for comands in the FIFO to process
- Submits commands to TReK via command API observing timing and other ISS program requirements
- Logs entries in the history file
- Updates the command set status to reflect command set processing status

# Command Set

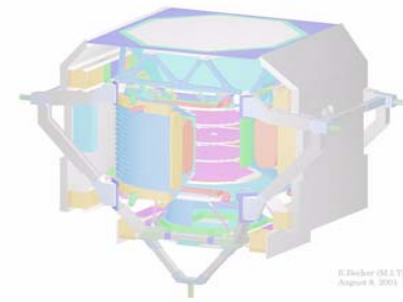


- ❑ A "Command Set" is the unit of command processing for the TReKGate complex. It is one or more AMSBlocks.
- ❑ ASCII text, in XML format, defining the series of AMSBlocks in terms of numeric constants.

```
<acs name="power state" priority="0x35">  
  <block node="0x1" bt="0x2" dt="0x3">  
    0x4, 0x5, 0x6, 0x7, 0x8, ....  
  </block>  
  <block node="0x4" bt="0x2" dt="0x5">  
    0x5, 0x6, 0x7, 0x8, 0x9, 0xA, ....  
  </block>  
  ....  
</acs>
```

- ❑ Submitted as a string argument (optionally hidden) within a POST request
- ❑ FBI - extensible via "editing parameters" within the POST parameters ("user friendly" HTML forms based commanding).

# HouseKeeping Flow



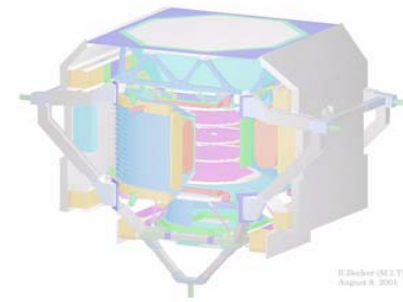
## ❑ AMS-02 Health and Status Telemetry

- Received by TReK and recorded.
- If TReK mechanism is determined to be suitable in nature and robust enough - this recording maybe used directly.
- If experience with TReK shows weakness in this design we will need to implement the Telemetry Information Server (TIS) to record this data.

## ❑ AMSBlock Files

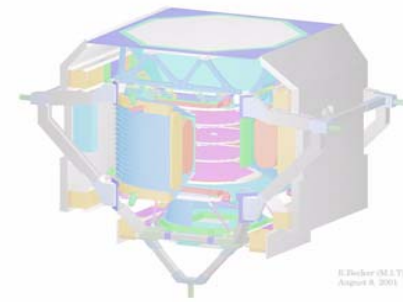
- Read directly by WebM and other applications needing access to HK data.

# WebM



- ❑ Program that runs as a background task reading the housekeeping (HK) data and producing web page files to a directory.
- ❑ Yet another "descendent" of the M program.
- ❑ The most recent version of each page is written to its file when data displayed in the page is updated.
- ❑ History option allows historical housekeeping data to be used to generate pages. Placed into a different file directory for view. (perhaps only a "single user" function).

# Alternate Operations



- ❑ For operations on STS TReK and its API are replaced with applications suitable to deliver the commands to NASA for transport to STS. The TIS application is also replaced with a suitable application.
- ❑ For ground and pad operations there will be some marriage with AAL software for 1553, HRDL, or RS422 communication.