# Data & Command Handling

Semester Review

1 May, 1998

PAS 218

# Current Active Team Members

## Will Betush - team leader

- **Hardware Group**
  - Igor Ageyev
    - group leader
  - Stephanie Zinn
  - James Tankersley
- **Software Group**
  - Michaelson Britt
    - group leader
  - Ken Huizenga

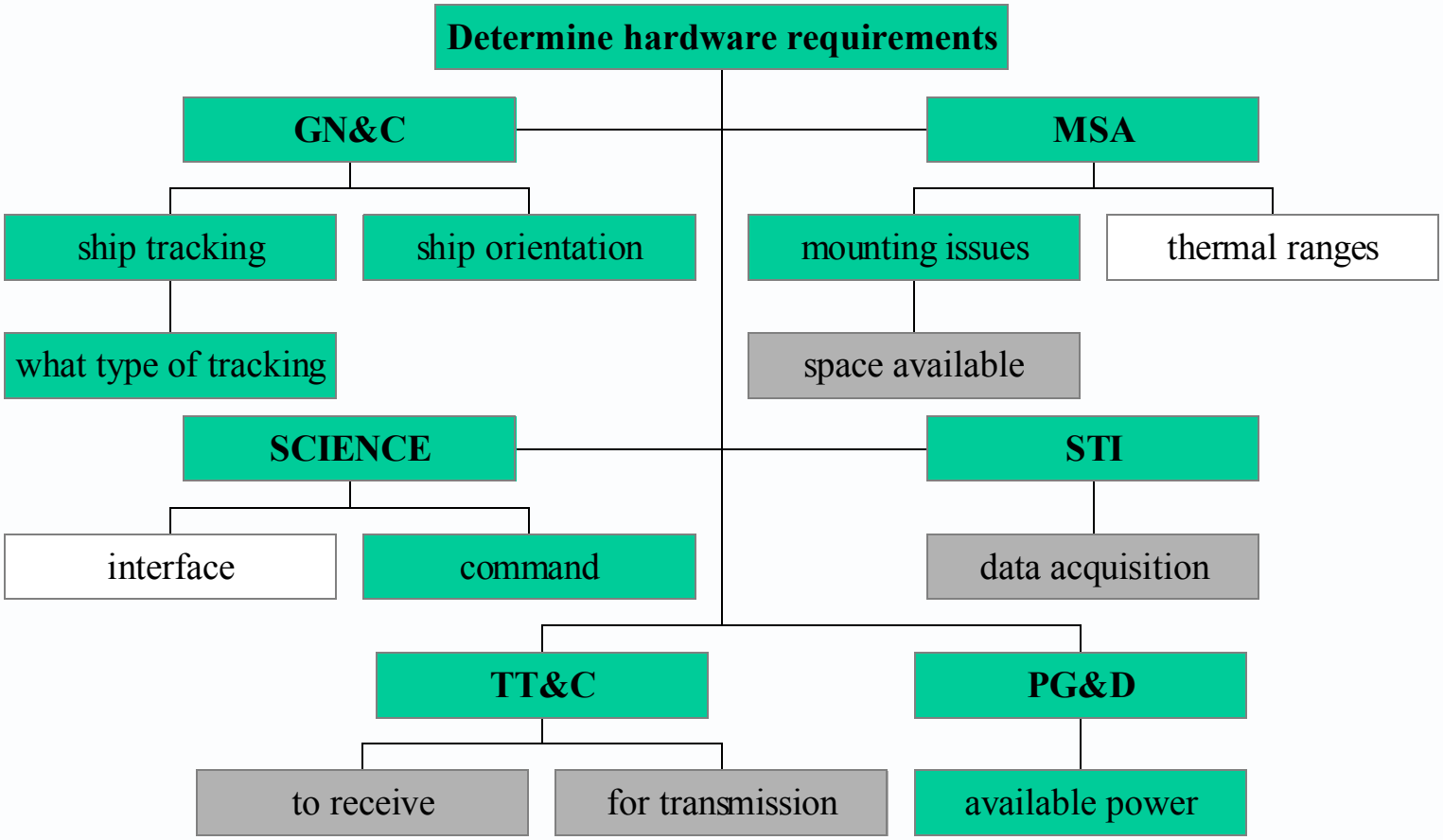
# Presentation Outline

- Current Status
- What assumptions need to be made to advance project
  - hardware
  - signal/data retrieval
- Operating system progress and issues
- Future plans including a brief schedule and summer plans

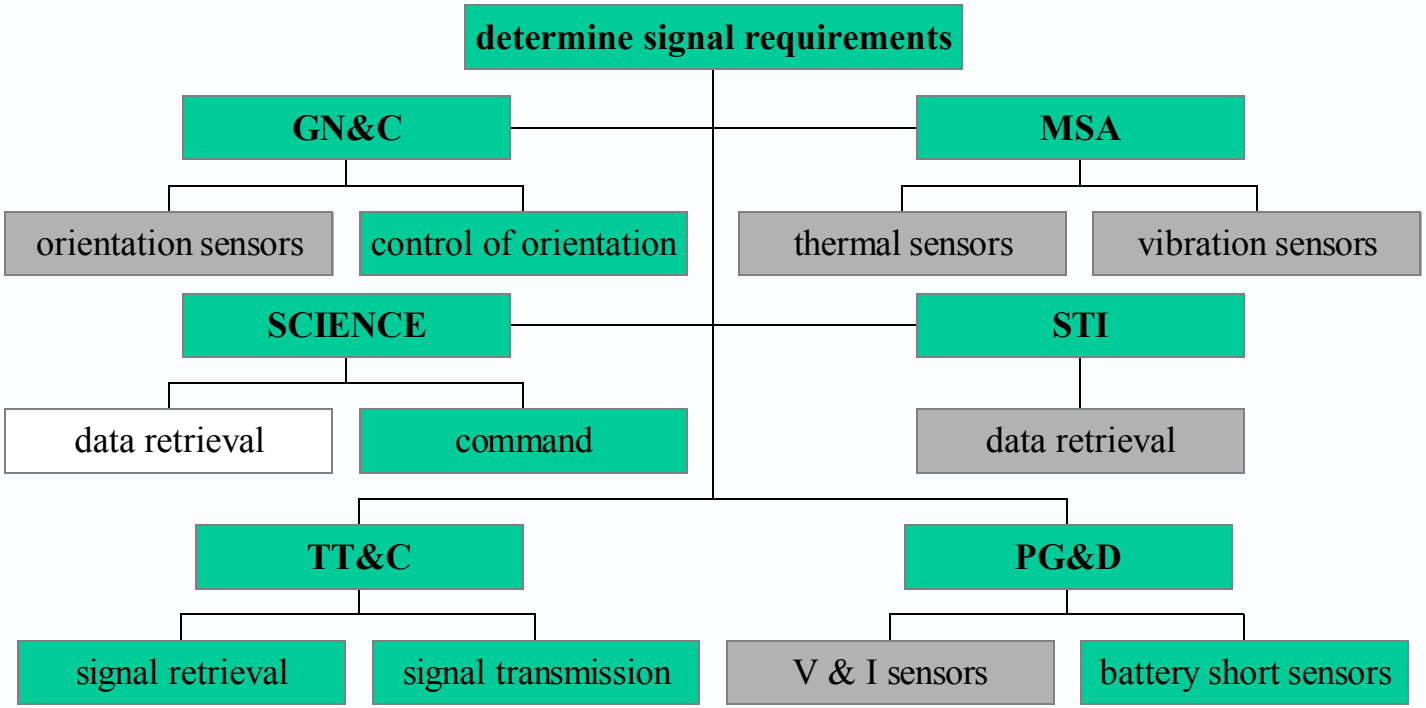
# Current status

- Type of connection with Science team laid out.
- Processor chosen.
- OS runs in protected mode, and some C-code can be compiled and run on it.

# What D&CH needs to assume about hardware



# What DC&H needs to assume about signal retrieval



# Operating System

- Needs to boot from RAM
- Multitasking
- real time
- small enough to be on flash RAM
- run in multiple modes (in order of priority)
  - protected (safe mode)
    - satellite will shut down, load clean version of OS into memory, and reboot itself

# Operating System

- Run in multiple modes (cont..)
  - Power generation
    - shut down all non-essential operations and stores power.
  - Data retrieval
    - receives command instructions, new OS uploads, etc.
  - Data transmission
    - sends data to TT&C or STI system for download.

# Operating System

- Run in multiple modes (cont.)
  - Science
    - receives pictures (already compressed) from science team and stores until transmission.
  - Lost contact
    - if satellite looses contact with ground for more than set number of days (about 20-30), it will shut down all non-survival systems, and try to establish contact with control. This is to reduce the possibility of failure without being able to fix it.

# Future of DCH

# Schedule

- High Level Milestones
  - Create an accurate model of all systems controlled by DCH computer (Mid-May)
    - Create state of operation diagrams both possible and appropriate

# Schedule

- OS either coded or selected, depending on coding progress (End of June)
  - Designing OS which is expected to be running by the end of June
  - If not done, OS will be selected. Probably a flavor of UNIX.

# Schedule

- Board design (End of Summer)
  - By end of Summer, requirements documented and designed for.
  - Mean while we will design according to what we know.
    - Design Power On/Off to appropriate systems.
    - Design Error handling hardware
    - Research and determine what type of EEPROM we can use as storage.
    - Determine priority of each subsystem(I.e. 1) Power 2) Guidance)

# Schedule

- Research (ongoing)
  - Summer is going to be a great time to gather information.
    - What have other Satellites done?
    - Increase DCH contacts with other resources (AMSat, ASUSat, etc.)

# Schedule

- Beyond Summer
  - Preparation of test board
  - Gathering of test equipment

# Summary Slide

- Mid-May
  - Accurate model of all systems controlled by DCH computer
- End of June
  - OS ready
- End of Summer
  - Board Design
- Ongoing
  - Research
- Beyond Summer
  - Testing

# Final Dates

- Posted in a few weeks.