

Space Station Advisory Committee

June 30, 1989

Space Station Information Systems Architecture and Status

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Space Station Advisory Committee Agenda

- Introduction
- Space Station Information System
 - Definition
 - Major Elements
 - Services
 - Overview Summary
- Communications
- On-board Data Management
- Issues Currently Being Worked
- Status of Key Items

Space Station Advisory Committee Introduction

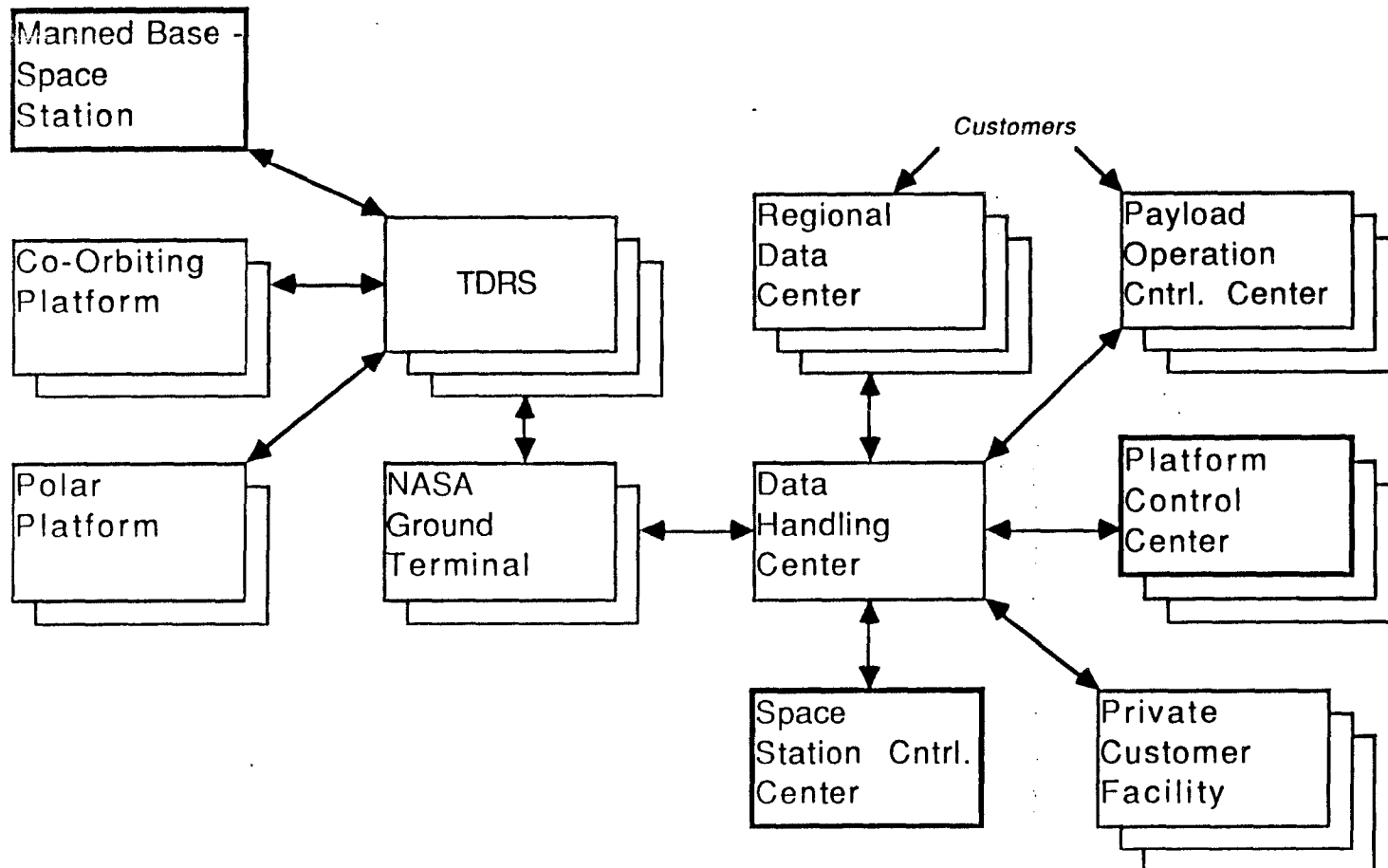
The Information System Challenges:

- Requirements
 - USERS
 - Communications
 - Standards
 - MOU's
 - Policy
 - Congress
 - Executive
 - OMB
 - Requirements Flow
 - Design Knowledge Capture
 - RMA
- The State of the Art
 - Commercial Off The Shelf Technology
 - Today's Promising Technology
 - Tomorrow's Technology
- The Architecture
 - 30 to 40 Years of Usage
 - Evolution (Scars & Hooks)

Space Station Advisory Committee Space Station Information System - Definition

- **The SSIS is the set of coordinated, compatible networks and systems which provide the required data, information and operations services to users of the Space Station systems. The users are the customers, both on the ground and in space, the flight crew, and the ground operations crew.**
- **The SSIS consists of both networks (e.g., onboard local networks, Space Network, NASCOM, PSCN) and systems (e.g., flight DMS, Space Station Support Center, Discipline Data Centers, Network Control Centers).**
- **The components of the SSIS are under many different management entities (e.g., Code S, Code T, Code E, ESA, NASDA, Canada).**

Space Station Information System Major Elements



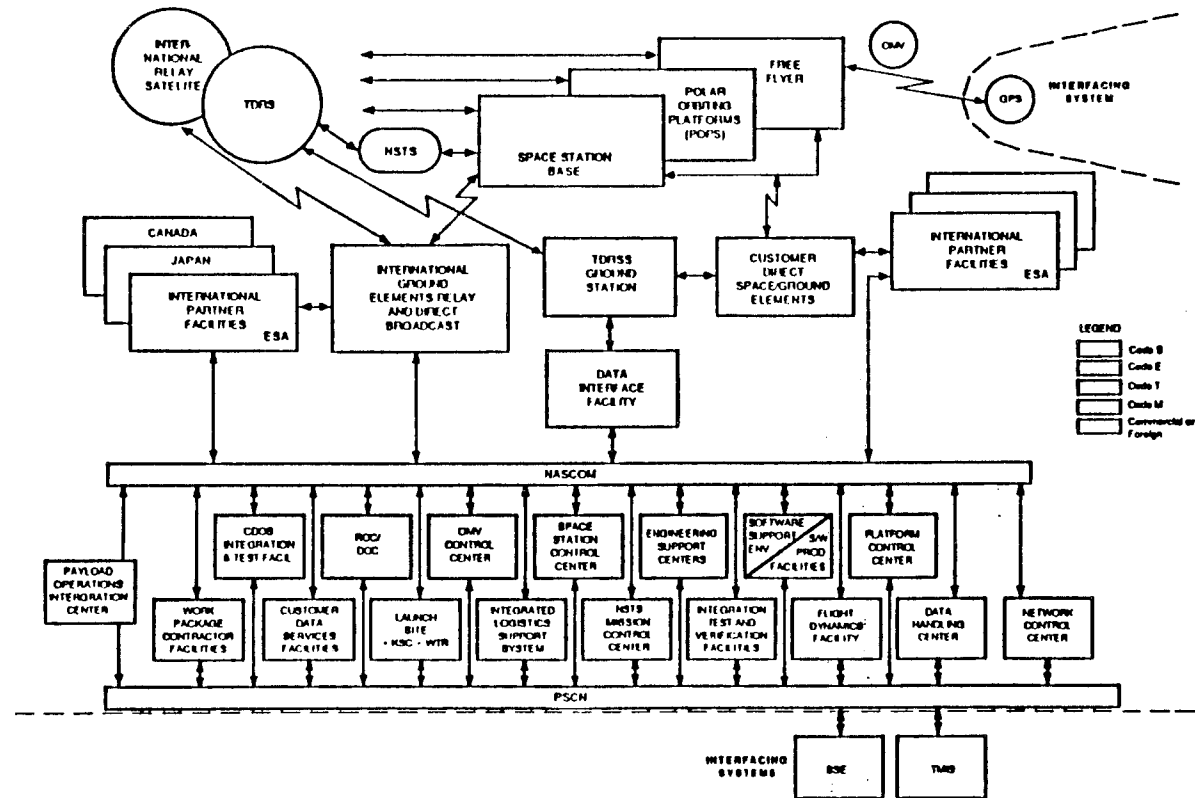
END-TO-END INFORMATION SYSTEM SERVICES

- **DATA PROCESSING AND DISTRIBUTION FOR MANNED BASE OPERATIONS AND COMMAND AND CONTROL**
- **PAYLOAD USER SUPPORT**
 - **"TELESCIENCE" - NEAR REALTIME INTERACTION BETWEEN A GROUND USER AND AN INSTRUMENT IN ORBIT**
- **SECURITY AND ACCESS CONTROL**
- **TRANSPARENT COMMUNICATIONS**
 - **PACKETIZED DATA ON VIRTUAL CHANNELS**
 - **COMMON PROTOCOLS**
 - **CONSISTENT DATA RATES**

END-TO-END INFORMATION SYSTEM SERVICES (CONTINUED)

- **DATA SYSTEM INTEROPERABILITY**
 - **PROCESSORS CAN EXCHANGE DATA FILES IN A FORM USEABLE BY BOTH**
 - **COMMON DATA BASE STRUCTURES**
- **SOFTWARE TRANSPORTABILITY**
 - **COMMON APPLICATIONS/OPERATING SYSTEMS INTERFACES**

Space Station Advisory Council Overview Summary



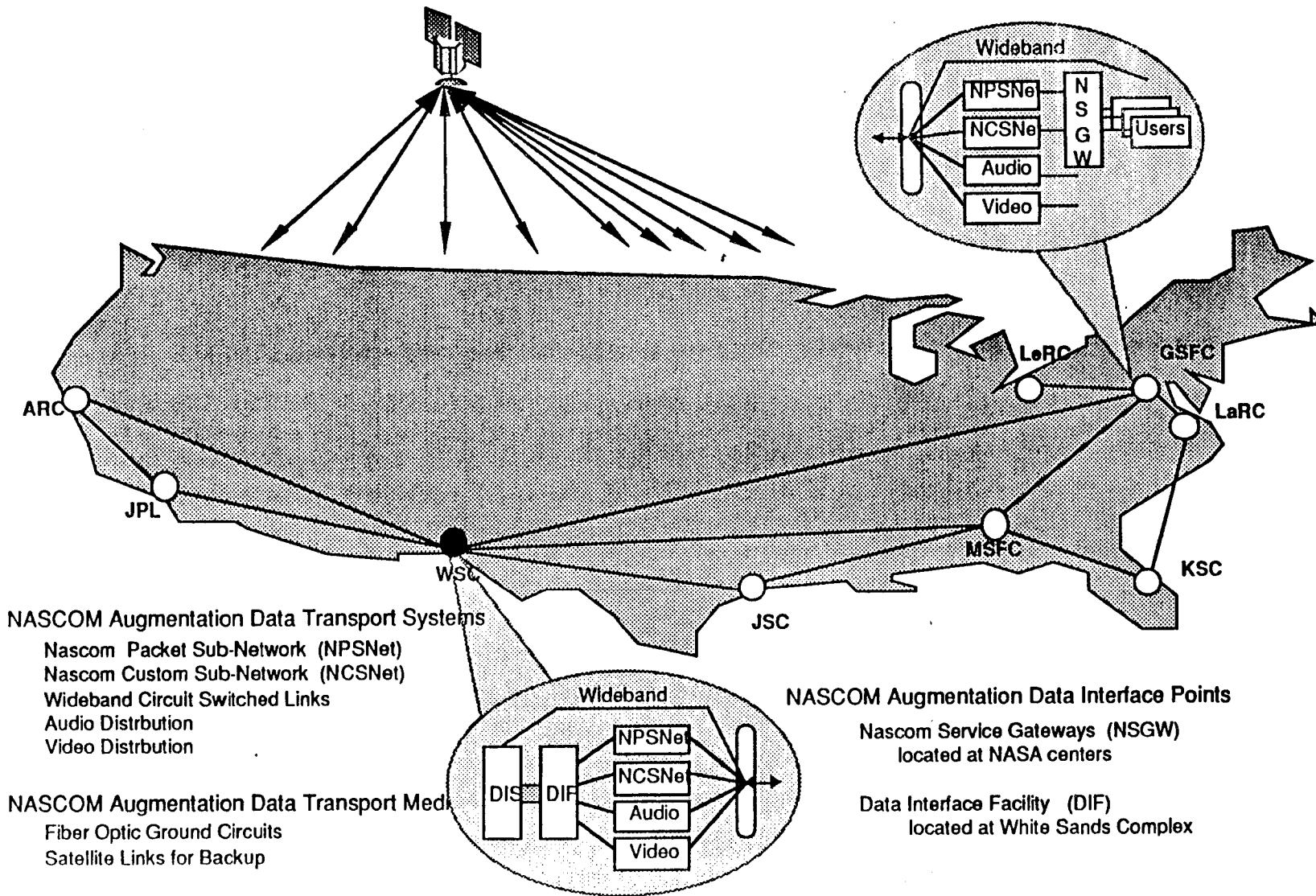
MO&DS
DIRECTORATE

INSF NASCOM Augmentation Presentation



CODE 500

NASCOM AUGMENTATION STRAWMAN DATA TRANSPORT TOPOLOGY



NASCOM Augmentation Data Transport Systems

- Nascom Packet Sub-Network (NPSNet)
- Nascom Custom Sub-Network (NCSNet)
- Wideband Circuit Switched Links
- Audio Distribution
- Video Distribution

NASCOM Augmentation Data Transport Media

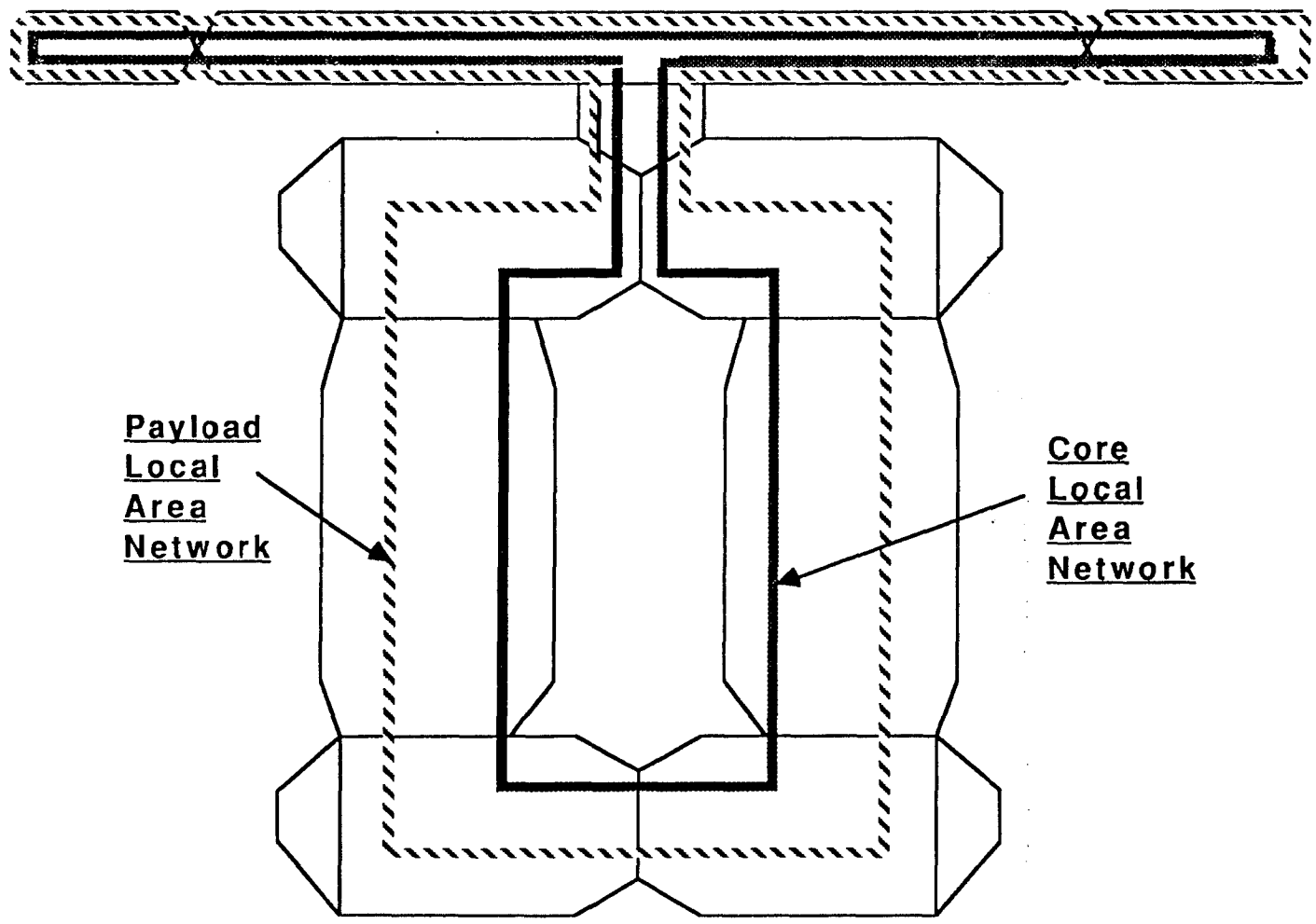
- Fiber Optic Ground Circuits
- Satellite Links for Backup

NASCOM Augmentation Data Interface Points

- Nascom Service Gateways (NSGW)
located at NASA centers
- Data Interface Facility (DIF)
located at White Sands Complex

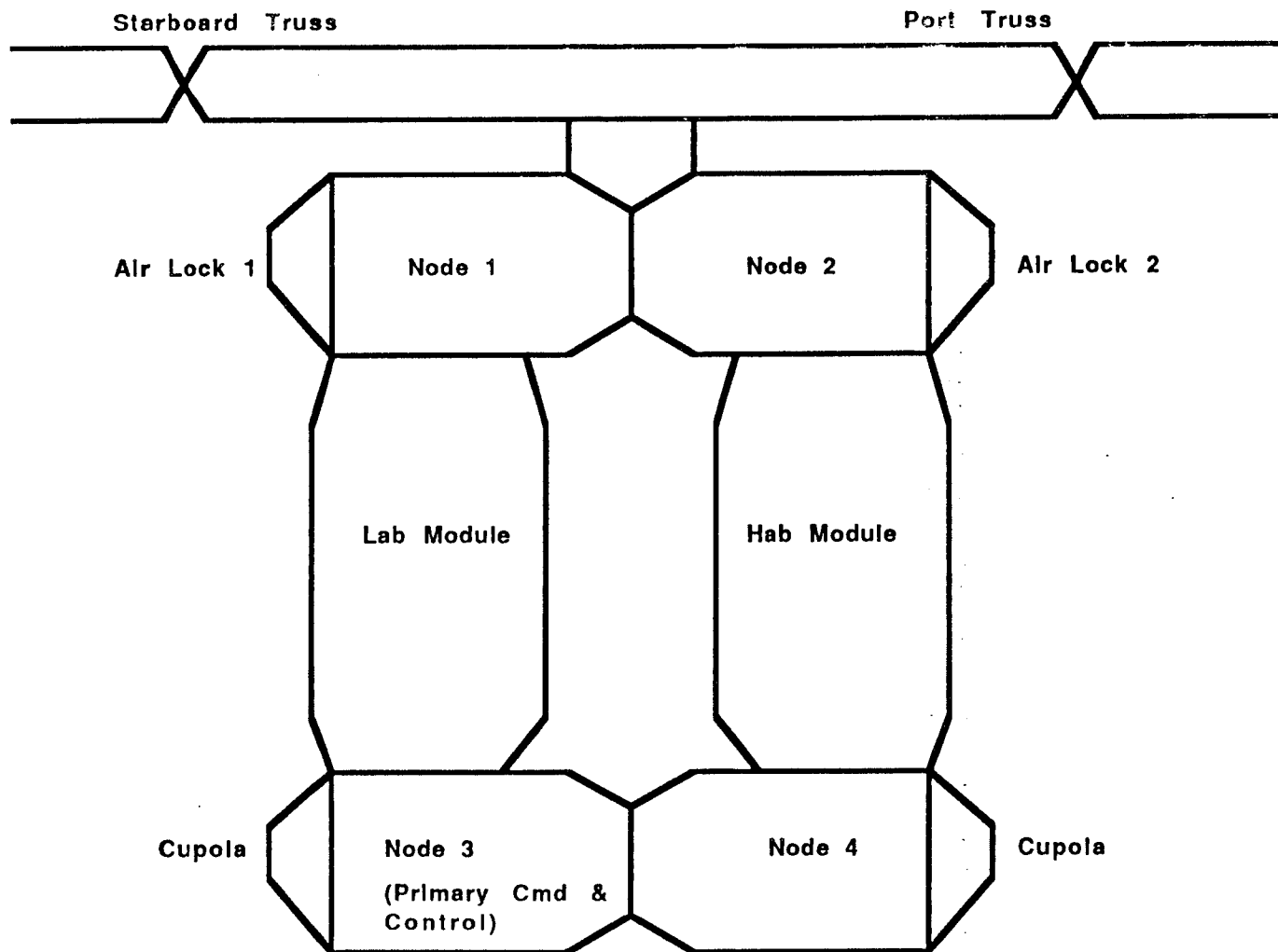
Space Station Advisory Committee

Data Management System



Payload
Local
Area
Network

Core
Local
Area
Network



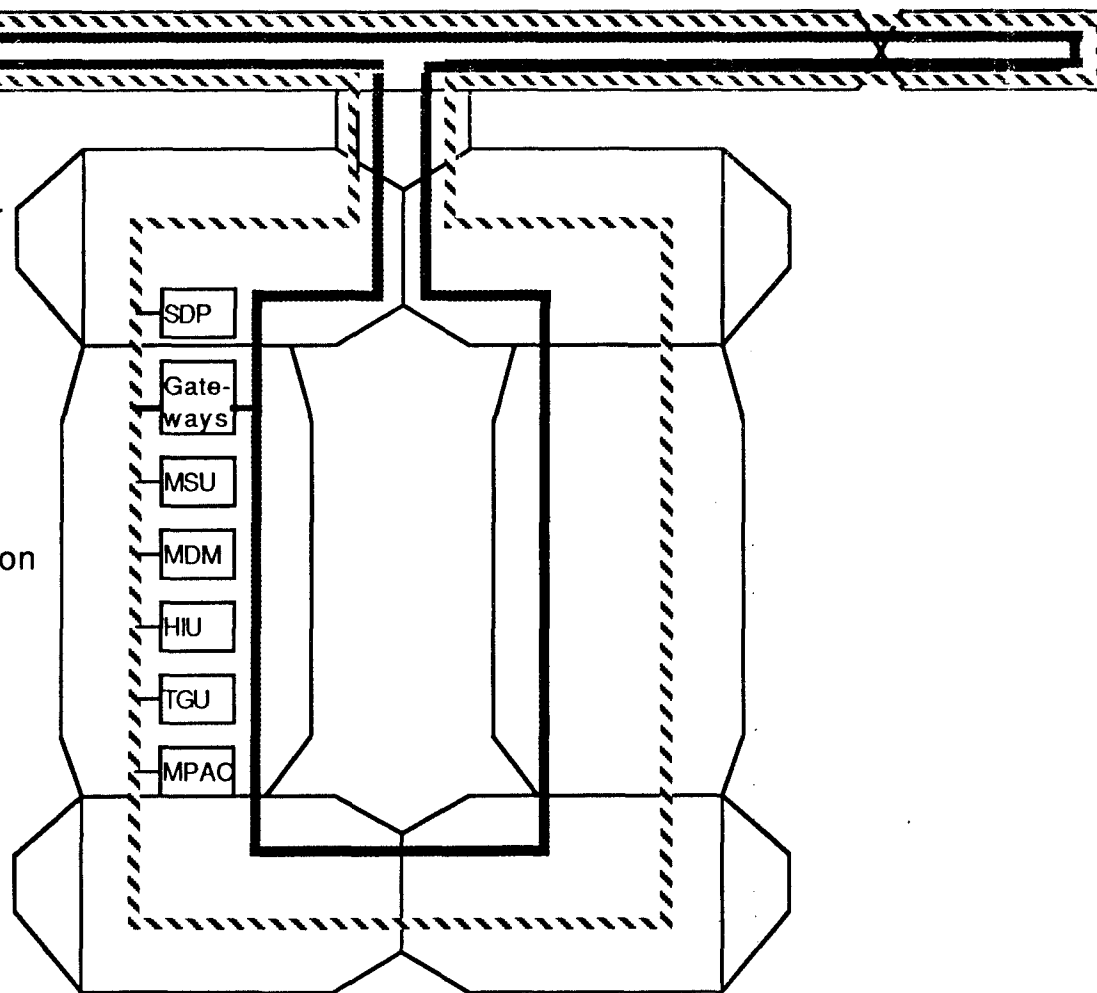
SDP - Standard Data Processor

MSU - Mass Storage Unit

MDM - Multiplex/Demux.

TGU- Time Generation Unit

MPAC - Multipurpose Application Processor



Space Station Advisory Committee Issues Currently Being Worked

- Communications Standards for Space-Ground Link
- Security/Privacy of User Data
- User-Computer Interface Standards
- Latency of User Data to Support Operations

Space Station Advisory Committee Status of Key Items

- Consultative Committee for Space Data Systems - Advanced Orbiting Systems (CCSDS AOS)
Codes T & S have agreed to make the AOS recommendations a standard for the program
- Data Management System Reviews -
 - System Requirements Review 7/89
 - Preliminary Design Review 12/89
- Advanced Tracking and Data Relay Satellite System -
Support for ATDRSS is strong within Code T and Phase B is funded