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## Paper Session I-C - Manned Industrial Space Soonest

Leon Ronquillo  
*Chalmette, Louisiana*

Dean Monitor  
*Slidell, Louisiana 1989*

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## **Manned Industrial Space Soonest**

Leon Ronquillo  
Chalmette,  
Louisiana

Dean Monitor  
Slidell, Louisiana  
1989

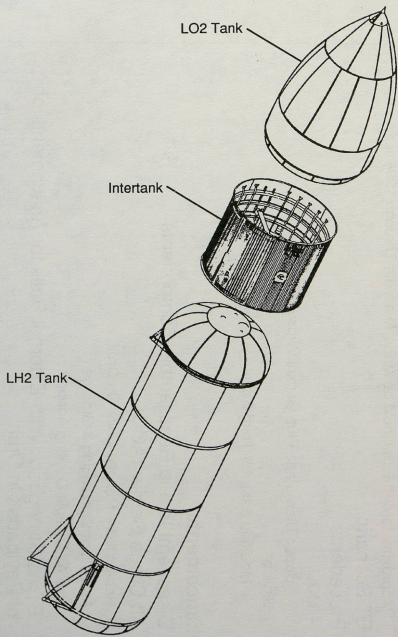
This paper, Manned Industrial Space Soonest, received its title as a take-off on the acronym MISS which stood for Man In Space Soonest. The new generation in space will be primarily concerned with development instead of exploration. We must reconsider our preconceived ideas. For instance, expendable versus reusable spacecraft does not have to mean nonreusable versus reusable launch vehicles. Reusable does not have to connote reentry, recovery, refurbish and reflly. A vehicle can be designed or even modified from a conventional expendable to launch a space station or platform in a single flight and even supply a space glider to serve as an emergency lifeboat or to return materials processed in space.

### **Resource Availability**

- President Reagan's Commercial Space Initiative
  - Approximately 40 ETs Could be Made Available Through 1994
- ET Scenario
- Precedents
  - MOL
    - Upper Titan Stage Plus Gemini Capsule
  - Skylab
    - Modified Saturn V Third Stage

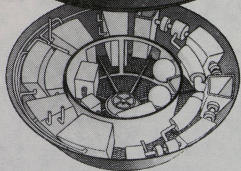
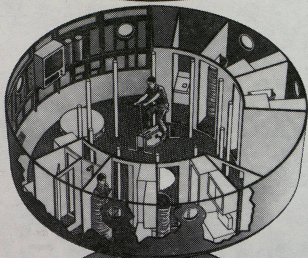
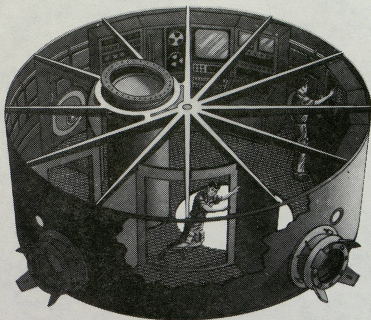
### **ET Enhancements**

- Disassemble and Reassemble Components
- Aft Cargo Carrier (ACC)
  - Habitat to be Manned Once On Orbit
  - Propellant Scavenging & Storage
  - Use As Multiple Docking Adaptor
- ET As Strongback With External Rails for Attachments of Payloads On Orbit

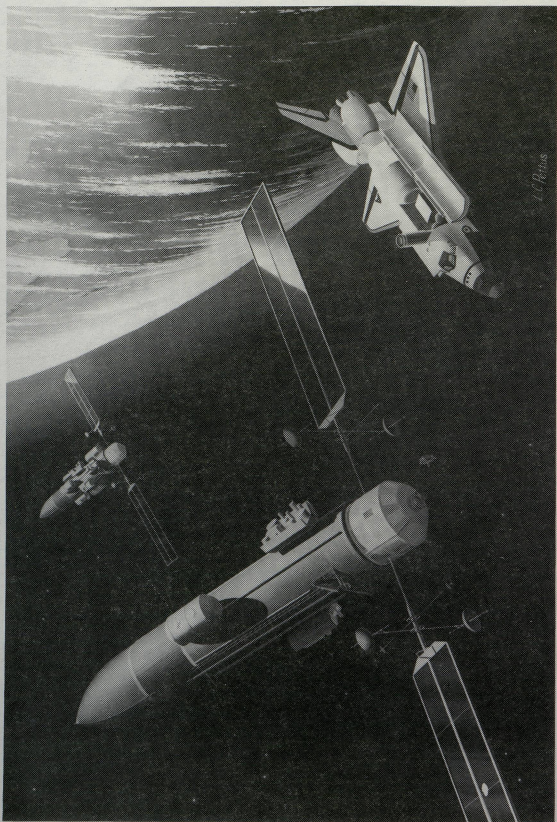


External Tank Structure





Aft Cargo Carrier Habitat

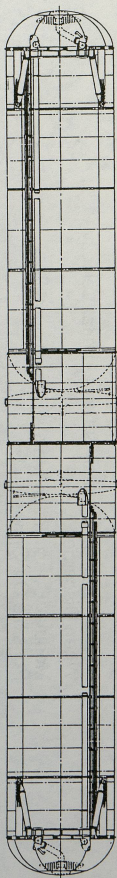


ET Strongback with External Rails

## ET Advantages

- Man Rated
- Low Cost
- Large Volume
- Great Strength and Rigidity
- Longitudinal/Transverse Ratio of Moments of Inertia (8.7) Therefore a Very Stable Gravity Gradient Orientation is Possible
- Already at Approximately 99% of Orbital Velocity When Discarded
- Modular Construction Makes Reconfiguration Possible On-Orbit
- ET Can Be Raised to a Higher Orbit and Orbiter Partially De-Orbited Without Use of Chemical Propulsion By Use Of Tether Operations





Possible On-Orbit Reconfiguration

## **Space Glider**

A Lifting Body Space Glider, Utilizing (by Design or Modification) a Portion of the Nose Cone Fairing of a Shuttle-Derived Vehicle Such as Shuttle-C or an Expendible Vehicle Can Provide a Return Vehicle (Manned or Unmanned).

Uses Include the Following:

- Return of Processed Material//Manufactured Products
- Return of Waste Products/Potential Space Debris
- Standby Lifeboat for Crew Rescue



## **Fastest/Lowest-Cost Path to a Space Facility**

A Shuttle-Derived Vehicle Such as Shuttle-C Could be Equipped with an ACC Habitat. Experimental or Production Equipment Carried in the Payload Bay Could Remain There if the Entire Vehicle is Orbiting or Some Could be Moved to the Exterior of the ET Serving as a Strongback. If the Nose of the Vehicle Were a Space Glider, It Could Serve as a Return Vehicle as Noted Earlier. This Configuration Could be Expanded with Other ET Components, Space-Labs or Space-Habs. This Scenario Would Yield the Fastest and Lowest-Cost Path to a Manned/Man-Tended Space Facility.