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BY 11 Jan. 91

INTRODUCTION

- System concept
- DARPA review
- TAURUS description
- Launch baseline
- CARRIE overview

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CARRIE PROGRAM

- DARPA funded tactical COMINT Mapping experiment.
- Launch on 1st TAURUS with TAOS program.
- Product of 1988 DARPA BAA and subsequent source selection.
 - Ball Aerospace spacecraft bus.
 - AIL Systems payload (through BYEMAN channels).
- SAFSP is procurement agent per MOA with DARPA.
- Payload ATP given 28 Sep 90.
- Spacecraft bus ATP expected mid-November.

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RECENT ACTIVITY

- Conducted \$200K concept definition study Jun-Jul 90.
- Formal Proposals received 16 Jul 90.
- Program brief to Program A 26 Jul 90.
 - Decision to rescope BSSD spacecraft bus and integration/mission support.
- Rescope TIMs held 1 Aug (D.C.), 10 Aug & 23 Aug (Boulder).
- TRW concept TIMs held 17 Aug & 27 Aug (L.A.).
- First TAURUS/TAOS/CARRIE working group held 16 Aug (D.C.).
- Program A endorsement received 7 Sep 90.
- NRO endorsement received 11 Sep 90.

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DARPA ASTP PROGRAM OVERVIEW

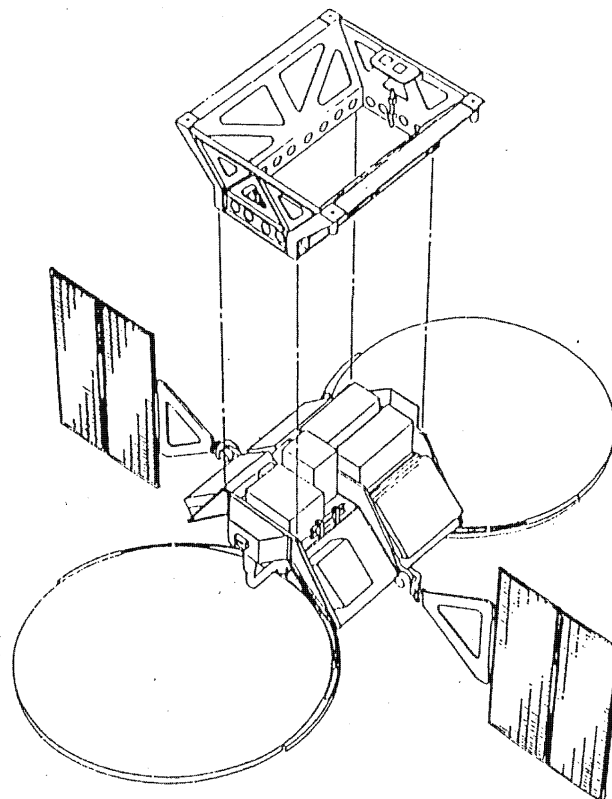
- **TAURUS launch vehicle.**
 - **PEGASUS derivative.**
- **COMINT and Rapid Reporting Interferometry Experiment (CARRIE) spacecraft.**
 - **Ball Space Systems Division (BSSD) bus.**
 - **AIL Systems, Inc. COMINT Mapping payload.**
- **Technology for Autonomous Operational Survivability (TAOS) spacecraft.**
 - **Defense Sciences, Inc. (DSI) Space Test Experiments Platform (STEP) bus.**
 - **Misc payloads (TRW integrator).**
 - **DARPA trading free ride for launch integration support.**

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ON-ORBIT ARRANGEMENT

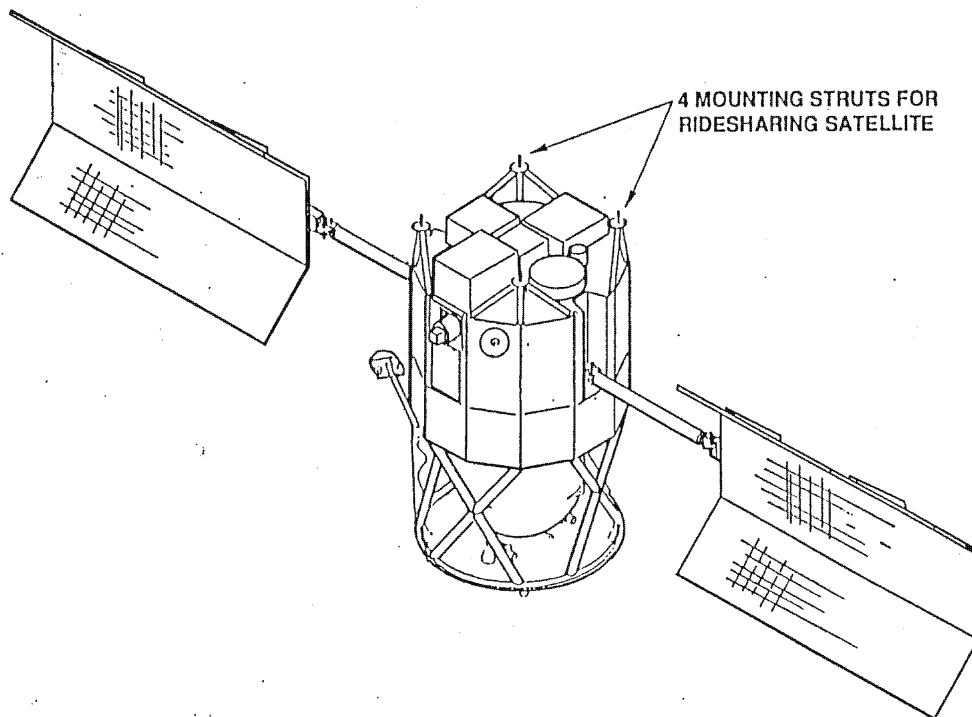


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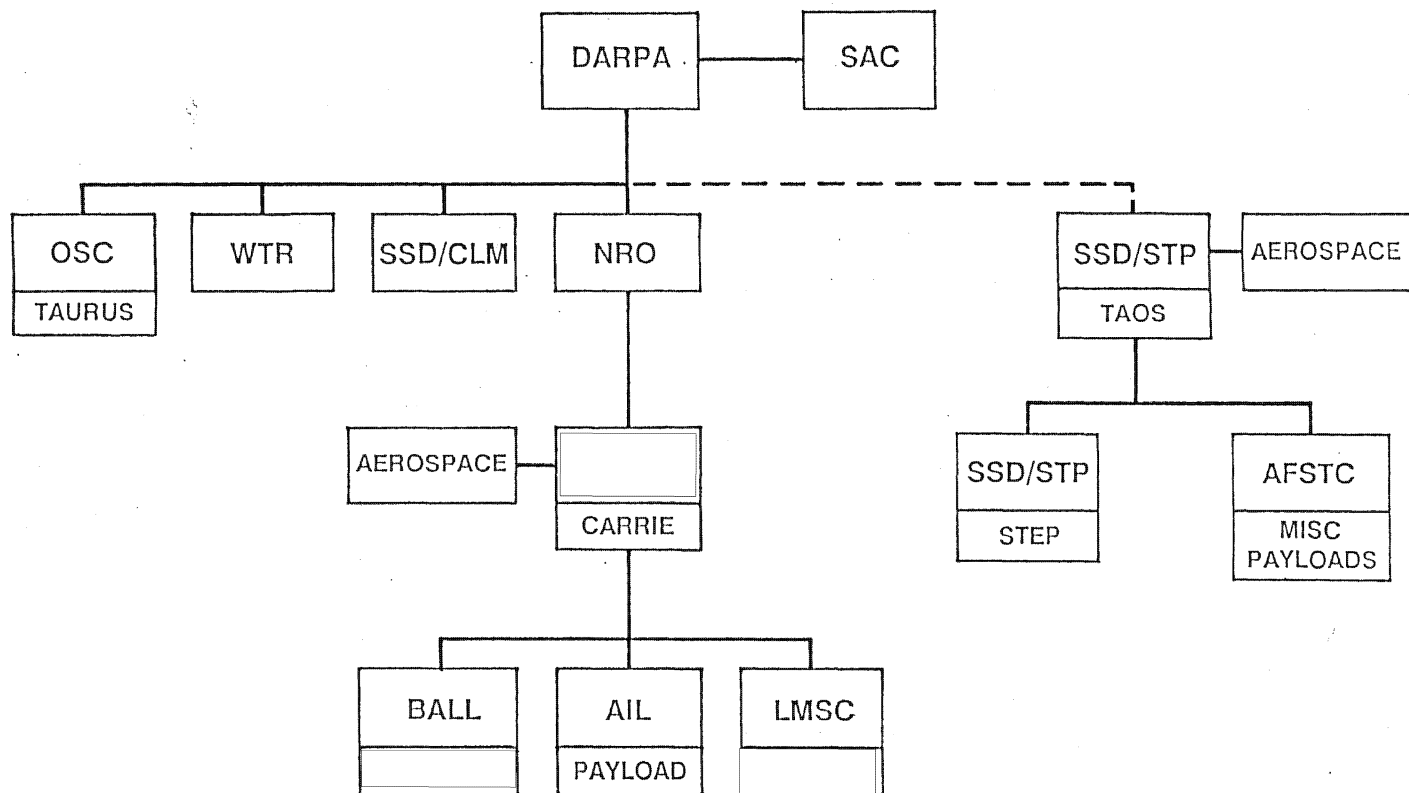
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TAOS SATELLITE

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Management Block Diagram



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DARPA CONSOLIDATED PROJECT OBJECTIVES

- TAURUS launch vehicle demonstration.
- Provide economical launch opportunity for CARRIE and TAOS.
 - Develop GPS receiver and fly on both.
- Demonstrate utility to tactical commanders.
 - Streamlined tasking of CARRIE spacecraft.
 - Rapid dissemination of data.

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DARPA REQUIREMENTS

- Total program cost must not exceed existing DARPA budget.
- Funding ends after one year operations.
- DARPA retains overall program management responsibility.
 - Delegates full management authority to [] for CARRIE.
 - [] provides full visibility to DARPA.
- DARPA directly manages launch operations and serves as overall Mission Director.
 - NRO provides Payload Mission Director.
- Tactical Demonstrations have priority for one year.
 - Provide streamlined tasking/dissemination directly by/to tactical commanders.

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TAURUS LAUNCH VEHICLE DESCRIPTION

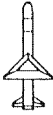
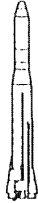
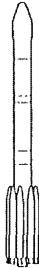
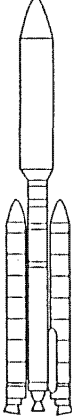
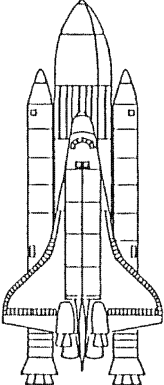
- **DARPA contract to Orbital Sciences Corporation.**
- **Four-stage, solid propellant, transportable booster.**
 - **Pegasus with Peacekeeper Stage 1.**
 - **Payload Fairing and Stage 0/1 Interstage unique.**
- **Bare base operations, concrete pad.**
- **Booster and all necessary LSE arrive at VAFB via convoy.**
- **Launch base established within 5 days of convoy arrival at VAFB.**
- **Launch within 3 days of payload(s) arrival at launch base.**

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National Launch Vehicles



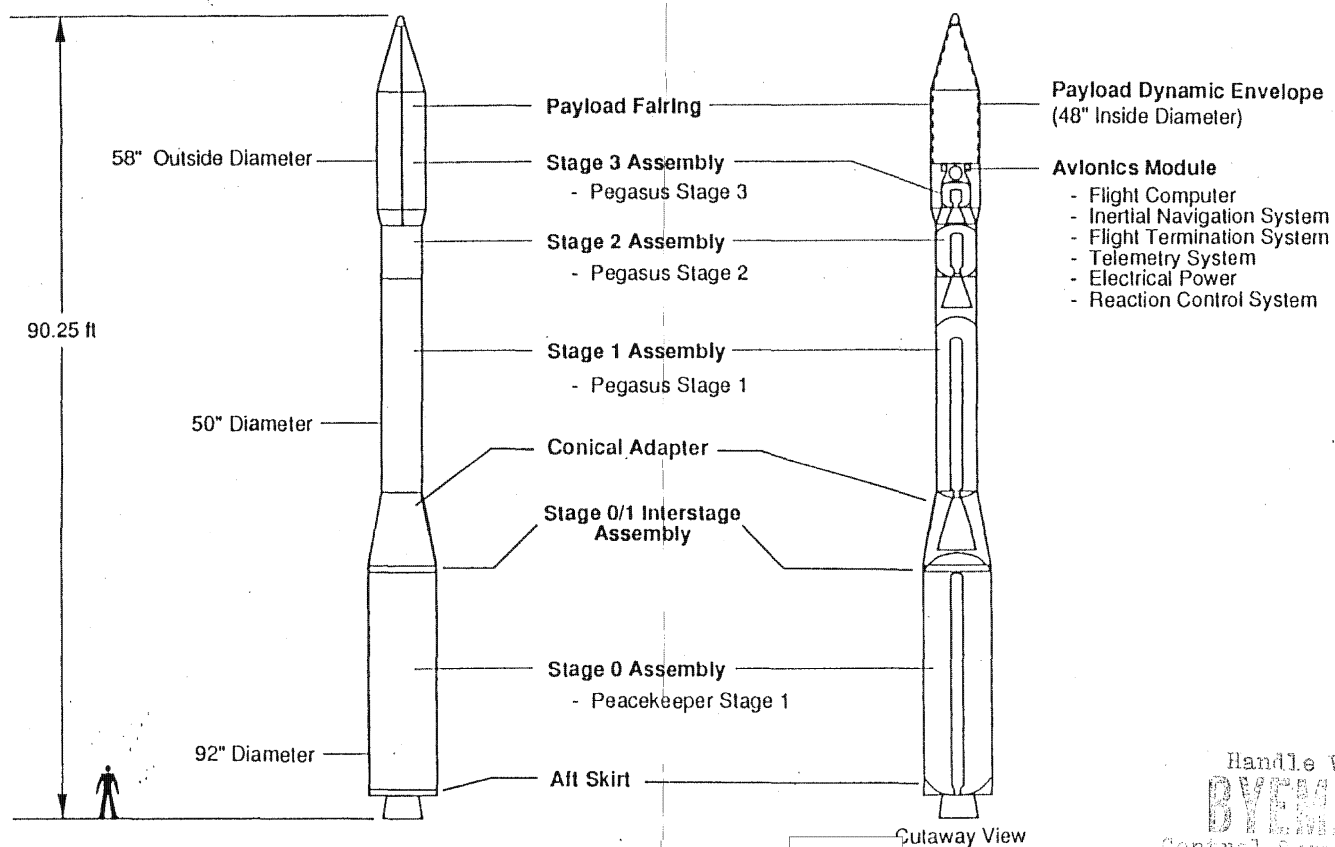
										
SCOUT	PEGASUS	TAURUS	ATLAS-E	TITAN II SLV	DELTA II	ATLAS CENTAUR	ATLAS II	TITAN 34D	TITAN IV (SRMU)	STS

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SSLV Vehicle Configuration

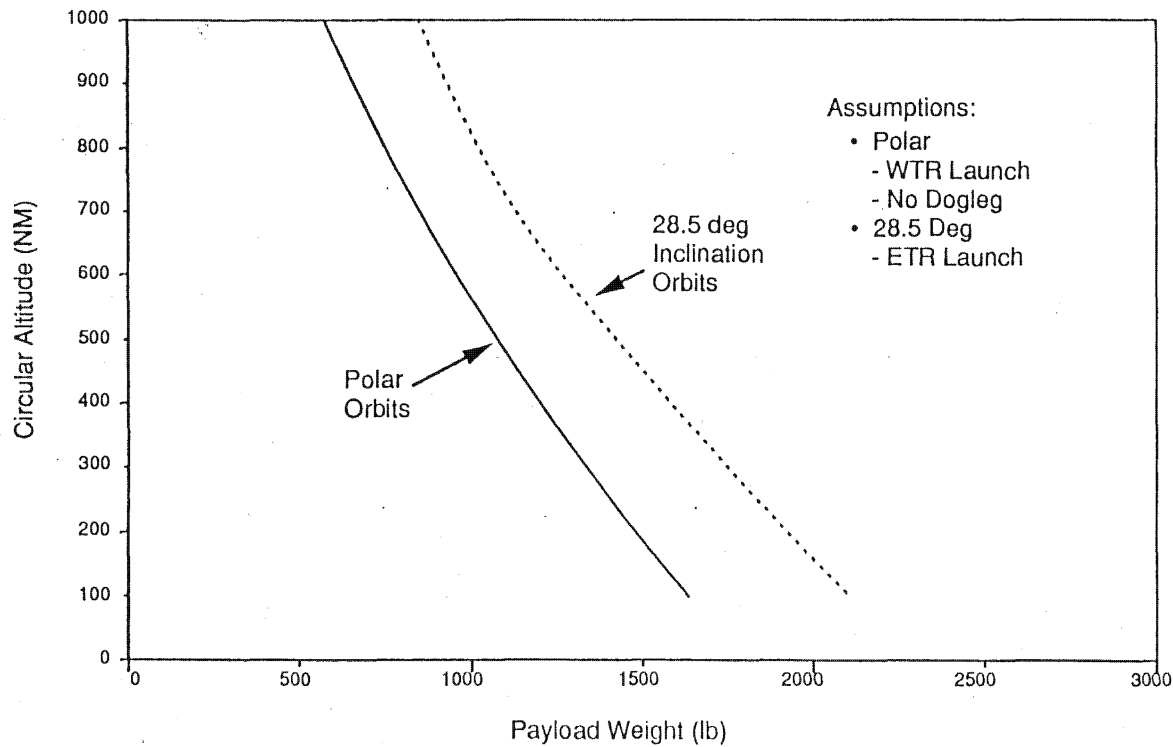


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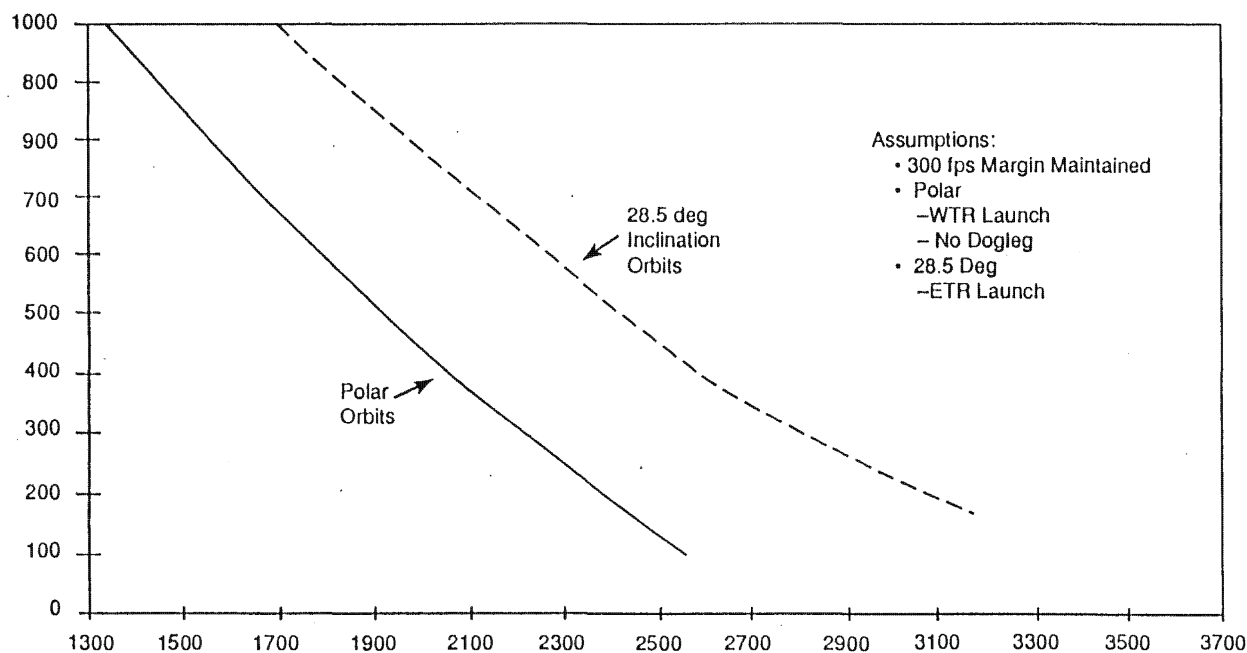
Taurus Ballasted Performance – Circular Orbits –

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Taurus Unballasted Performance – Circular Orbits –

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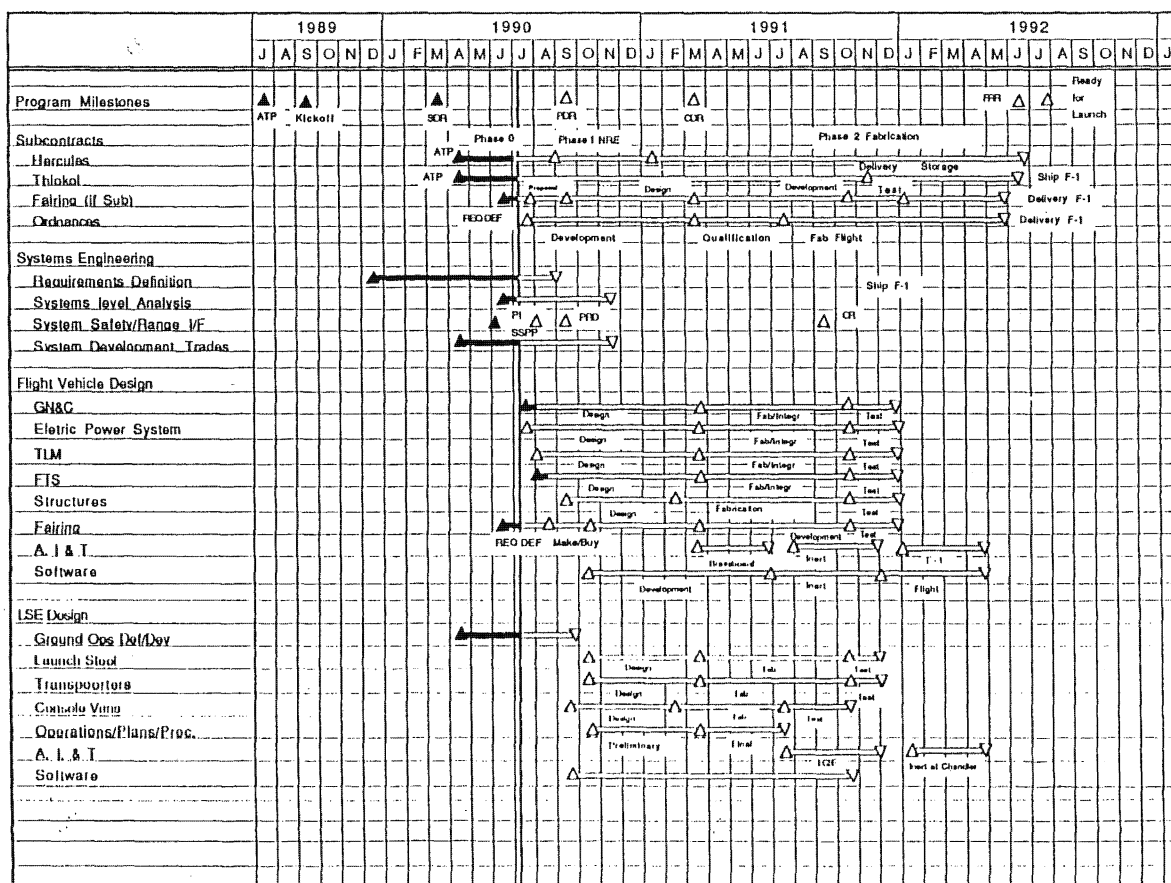
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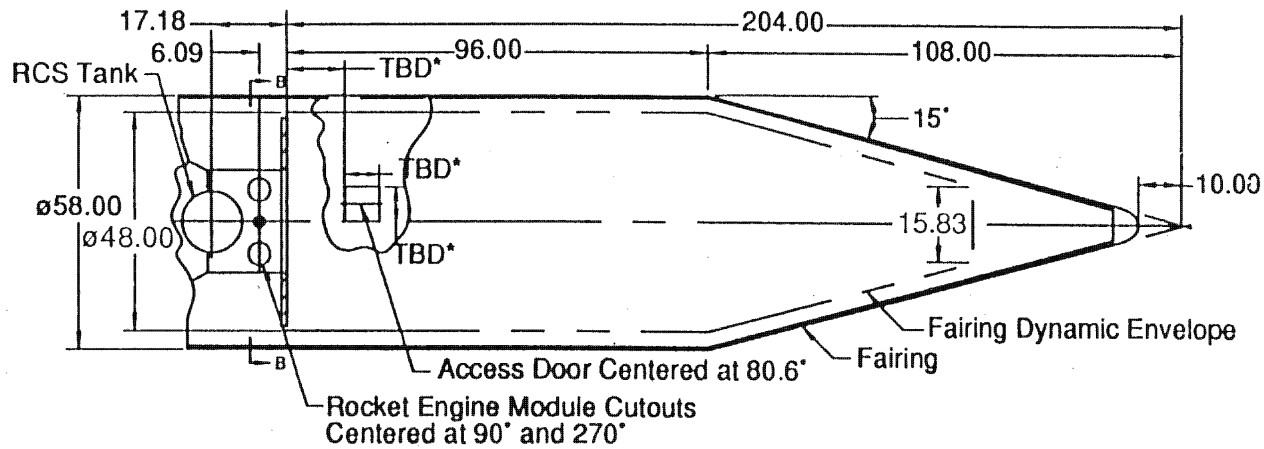
Taurus Master Schedule

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UNIT 1

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Baseline Taurus Fairing



***As Required to Meet Payload Requirements**

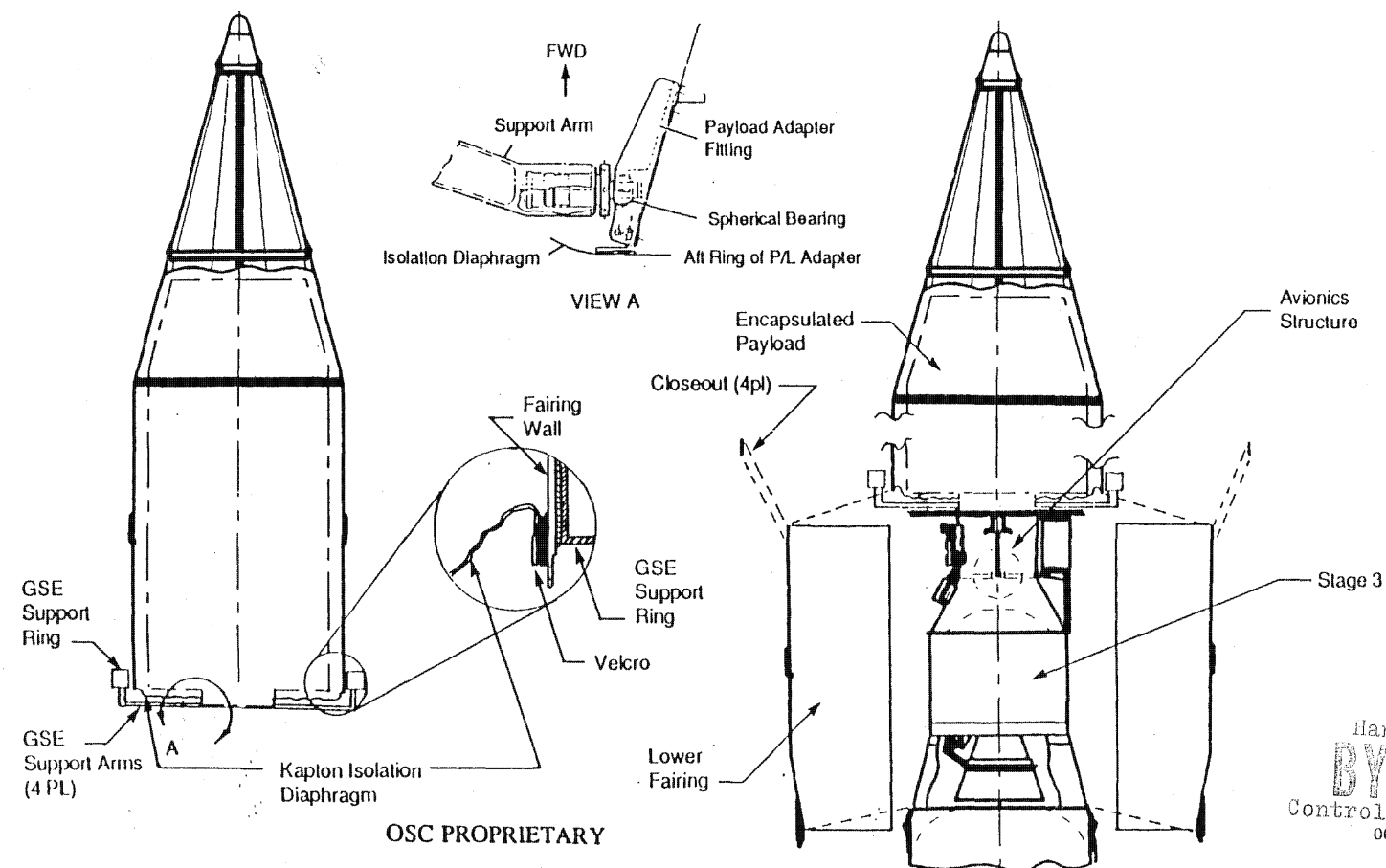
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Encapsulated Payload Concept Baseline Fairing



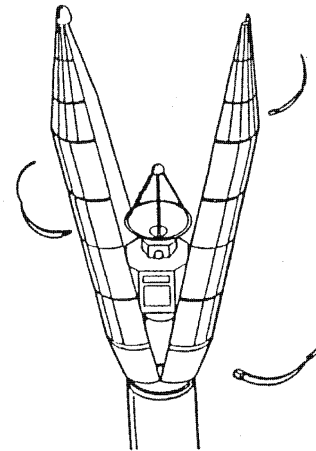
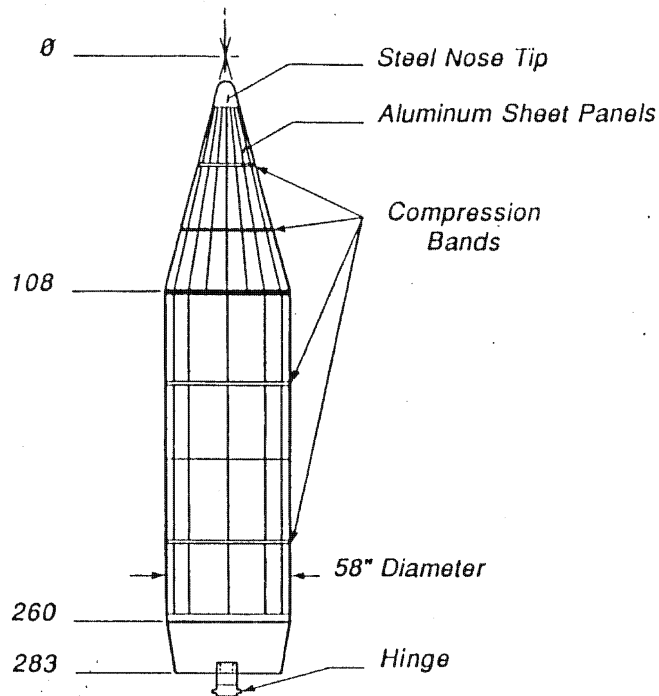
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Taurus Payload Fairing Deployment



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ALTERNATIVE FAIRING CONCEPTS

- DARPA having OSC look at more suitable fairings but cost, schedule and technical risks not yet known.
- Larger, single-encapsulated fairing:
 - More height and diameter for payloads.
 - Improves payload load paths.
 - Increases number of potential TAURUS users.
 - Allows larger attach ring for TAOS.

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ALTERNATIVE FAIRING CONCEPTS cont.

- Larger, dual-encapsulated fairing:
 - All of the above, plus:
 - Eliminates need for Multiple Satellite Assembly (MSA) and combined testing.
 - Allows TAURUS to spin up CARRIE.

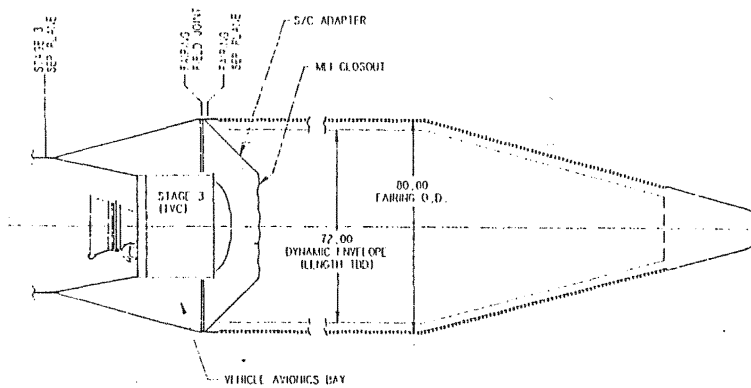
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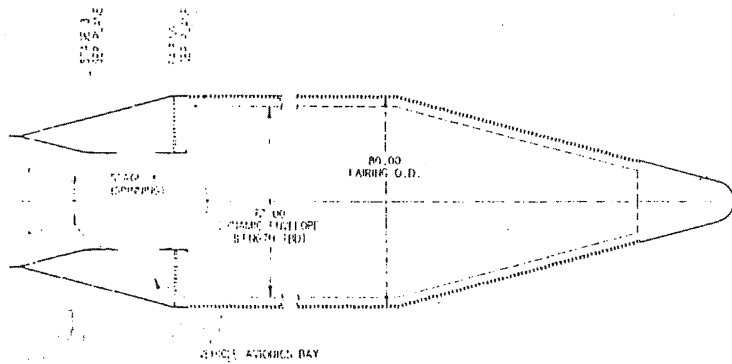
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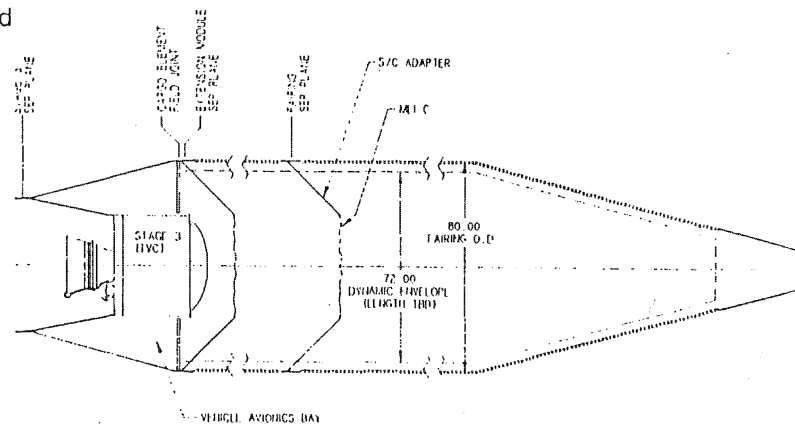
Taurus Fairing Options



Encapsulated Payload



Maximum Performance Design



Dual Encapsulated Payloads

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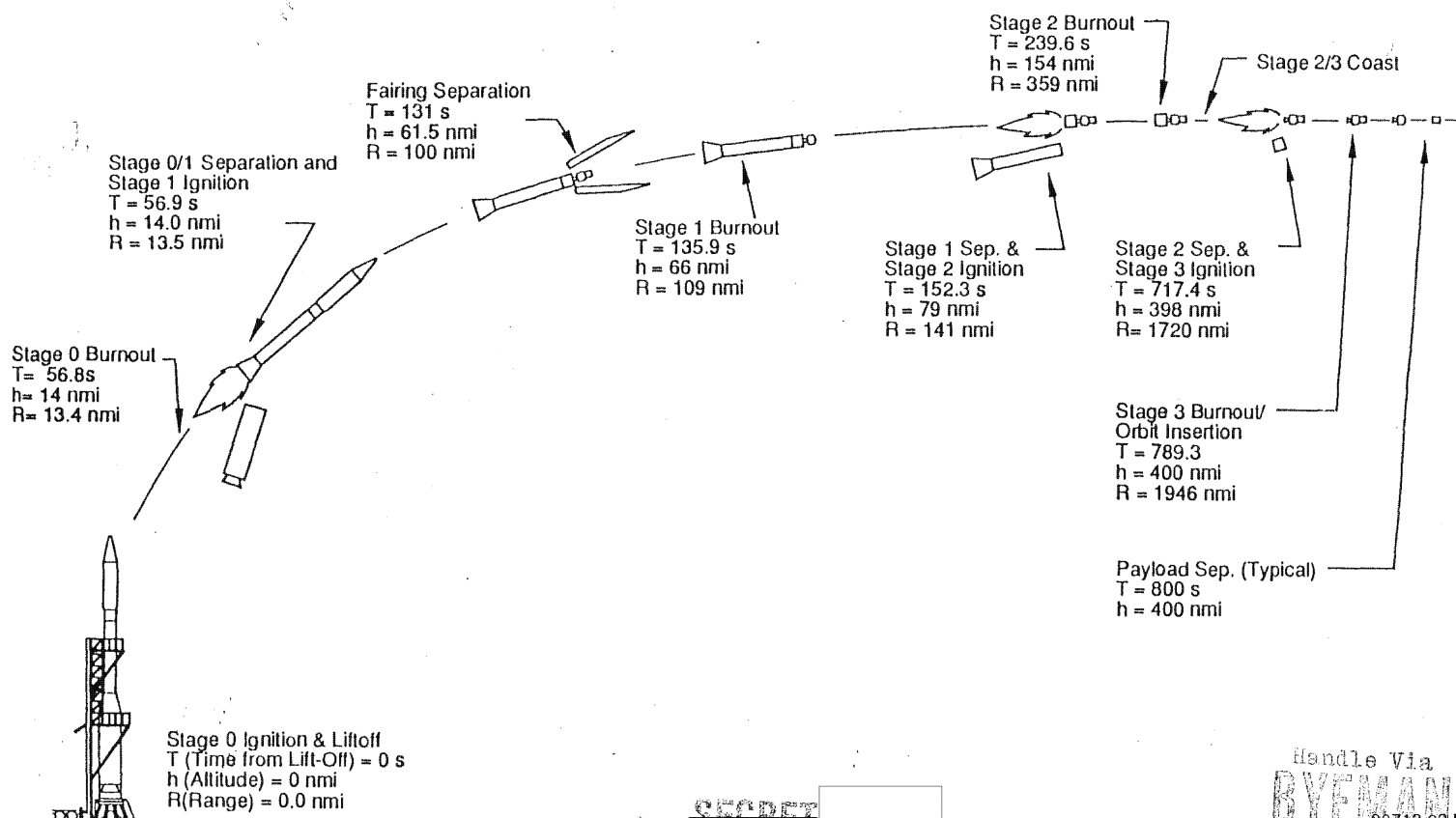
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BASELINE LAUNCH CONCEPT

- **North VAFB launch site.**
 - Avoids arms control inspection issue but requires dogleg for 75 deg inclination.
 - Dogleg reduces TAURUS performance significantly.
 - Retrograde orbit baselined.
- **Encapsulated fairing design.**
 - Tight fit but good for security & cleanliness.
- **CARRIE/TAOS integration at VAFB.**
- **4th quarter FY '92 launch.**
 - Ambitious schedule.

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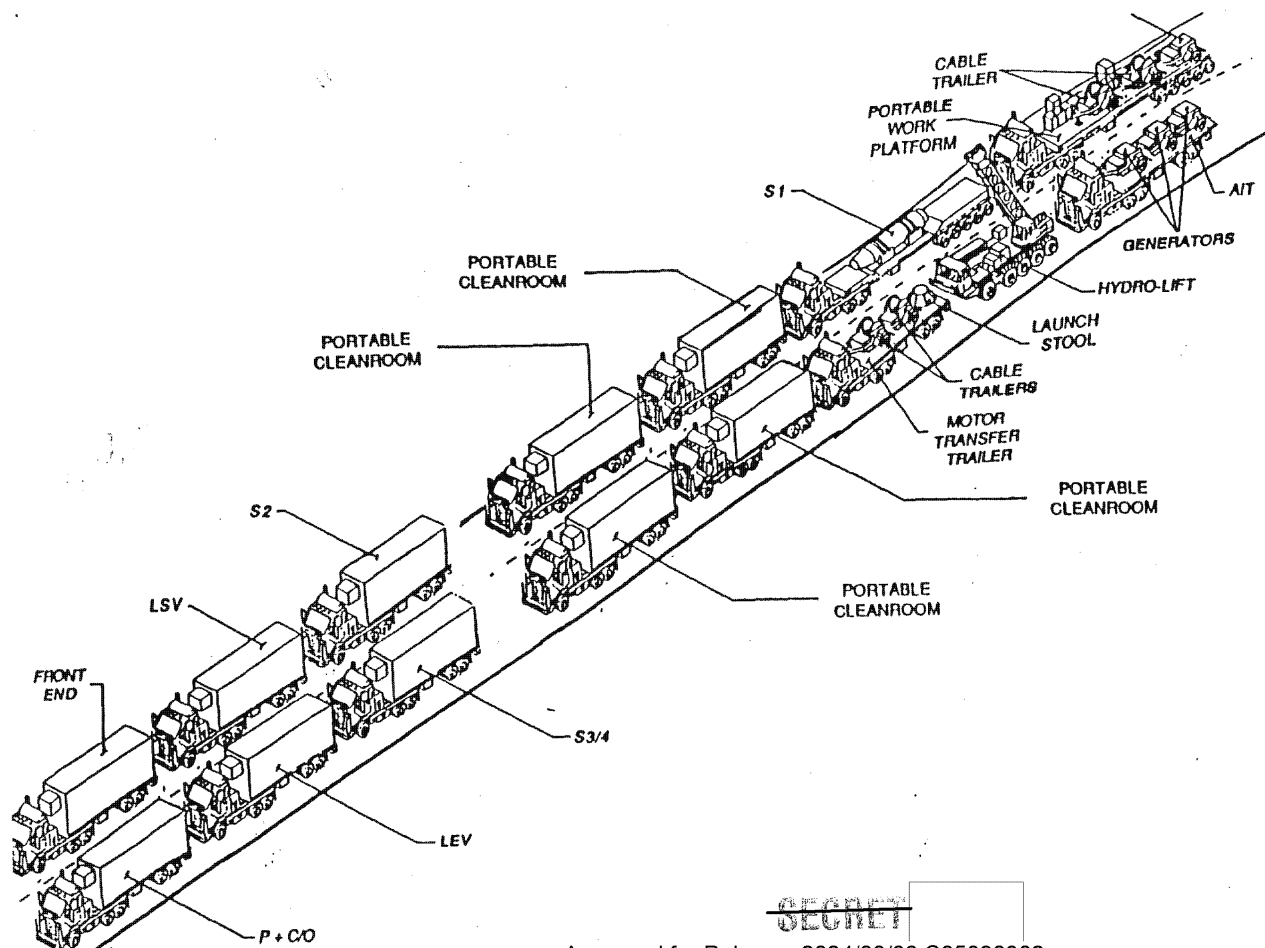
SSLV Baseline Mission Profile (400 nmi Orbit Trajectory)



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SSLV Convoy

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CARRIE DESCRIPTION

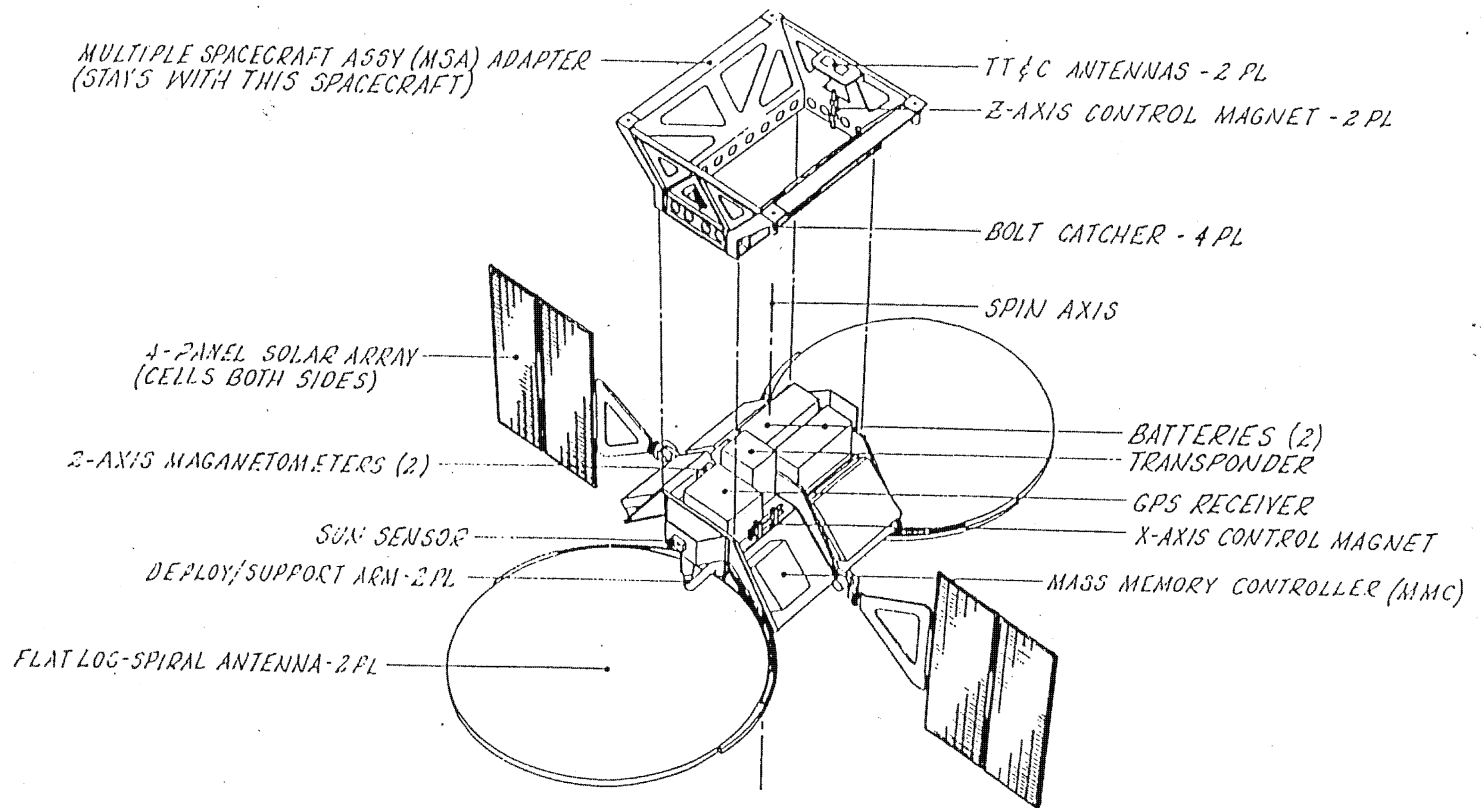
- Experimental 100-850 MHz COMINT Mapper.
- 280 nmi circular orbit.
 - 105 deg inclination.
- AFSCN TT&C,
- 20 rpm inertial spinner.
- On-board geolocation of communications emitters.
- SGLS downlink/reporting to EPDS vans.
- Approximately 250 lbs.
- 1 year MMD.

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ON-ORBIT ARRANGEMENT/COMPONENTS

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BSSD SPACECRAFT BUS DESCRIPTION

- Based on GLORIA I,II design.
 - Retains ADCS, EPS, TT&C, and Mass Memory Controller.
 - New structure, thermal subsystem, antenna deployment mechanisms, and solar arrays, drives & hinges.
- Approximately 200 lbs.
- Two-sided solar arrays (Si cells).
- SGLS transponder (64 Kbps rate).
- On-board GPS receiver.
- 2.5 Mbytes solid state storage.

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PAYLOAD DESCRIPTION

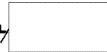
- 100-850 MHz frequency coverage.
 -
- On-board processing.
 - Identifies and geolocates communications emitters.
 - Co-channel interference discriminator.
- Pre-detection samples.
 - Dual channel, full spin capability.
 - Used by analyst to evaluate payload performance.
 - Requires approximately 2 Mbytes storage.
 - Limited to one sample per station contact.

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RESOLUTION ITEMS

- BSSD proposal evaluation/contract.
- Ops concept definition.
 - Streamlined tasking.
 - Data dissemination to EPDS vans.
- VAFB integration & checkout activities.
- Security approach.
- Contracting approach.

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