COMINT AND RAPID REPORTING INTERFEROMETRY EXPERIMENT

"CARRIE"

PROGRAM OVERVIEW

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Approved for Release: 2024/08/07 C05098303

OBJECTIVES

- SATISFY KNOWN SIGINT COLLECTION SHORTFALL

- DEMONSTRATE ADVANCED TECHNOLOGY
  - REPROGRAMMABLE ON-BOARD PROCESSOR
  - ALGORITHMS FOR GEOLOCATION AND IDENTIFICATION
  - MINIATURE GPS RECEIVER

- DEMONSTRATE THE TACTICAL UTILITY OF A DEDICATED OVERHEAD SIGINT SYSTEM
  - STREAMLINED TASKING
  - ON BOARD GEOLOCATION AND IDENTIFICATION
  - DIRECT DOWNLINK TO EPDS VAN

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CARRIE MEETS REAL REQUIREMENTS

REQUIREMENT	NSA REQUEST	CARRIE CAPABILITY
RF Range	0.12 - 2.0 GHz	0.10 - 0.85 GHz
Target Signals		
Pre-detection	B/W up to 250 KHz (several minutes)	B/W 100 KHz (1 spin-digital storage)
Ant. Polrztn.	Selectable L,RHCP	RHCP
Throughput	1000 geos / day	
Geo Accuracy		
RF Accuracy	10-100 KHz	50 KHz
Inclination	60 - 70 deg	105 deg
Spin Axis	North-South	North-South
Mission Duration	3 years	1 year

(From Aug 87 NSA P52 letter describing a CONINT Mapping System minimum requirements set.)

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CARRIE PROGRAM

- DARPA funded tactical COMINT mapping experiment.
- NRO executed reconnaissance spacecraft acquisition program
- Product of 1988 DARPA broad area announcement and subsequent source selection:
  - Ball Aerospace: spacecraft bus and integration
    - ATP 17 Dec 90
  - AIL Systems: COMINT mapping payload
    - ATP 28 Sep 90
- Launch on 1st TAURUS booster with TAOS spacecraft: 15 Oct 92

CARRIE DESCRIPTION

- o 400 lb Spacecraft in 280 nm orbit
- o Experimental COMINT mapping mission
  - oo On-board search, ID, geolocation and reporting of select tactical comms
    - ooo
  - oo Direct reporting to EPDS van
- o AFSCN /

LAUNCH SEGMENT OVERVIEW

- FIRST TAURUS LAUNCH (PEGASUS + PEACEKEEPER 1ST STAGE)
- BOOSTER PROGRAM IS AN EXPERIMENTAL CONCEPT FOR A RAPID REACTION LAUNCH CAPABILITY
  - Streamline booster launch base processing
  - Spacecraft encapsulated prior to booster integration
- LAUNCHED FROM NORTH VANDENBERG AFB 3RD QTR CY 92
- RIDESHARE WITH TAOS spacecraft

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GROUND SEGMENT OVERVIEW

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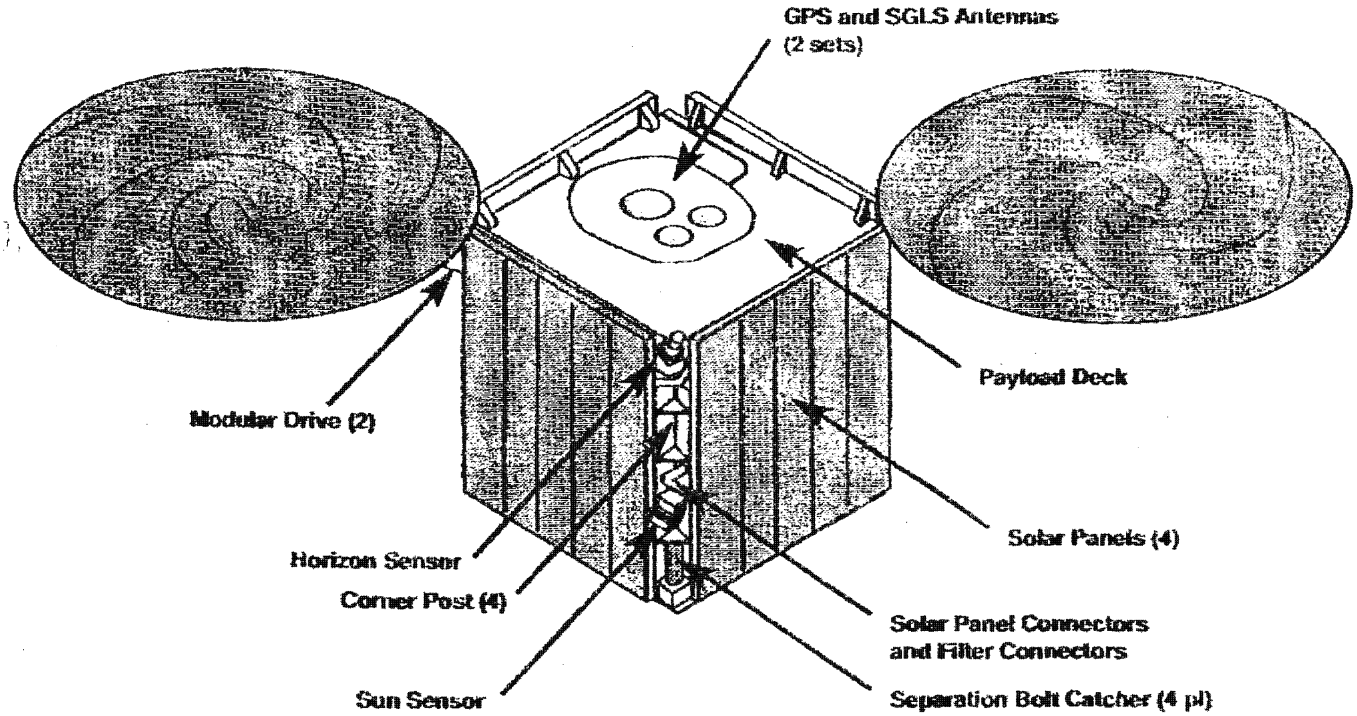
- EPDS vans
  - Receive transponds in theatre
  - Provide focal point and connectivity to tactical requests

CARRIE SPACECRAFT



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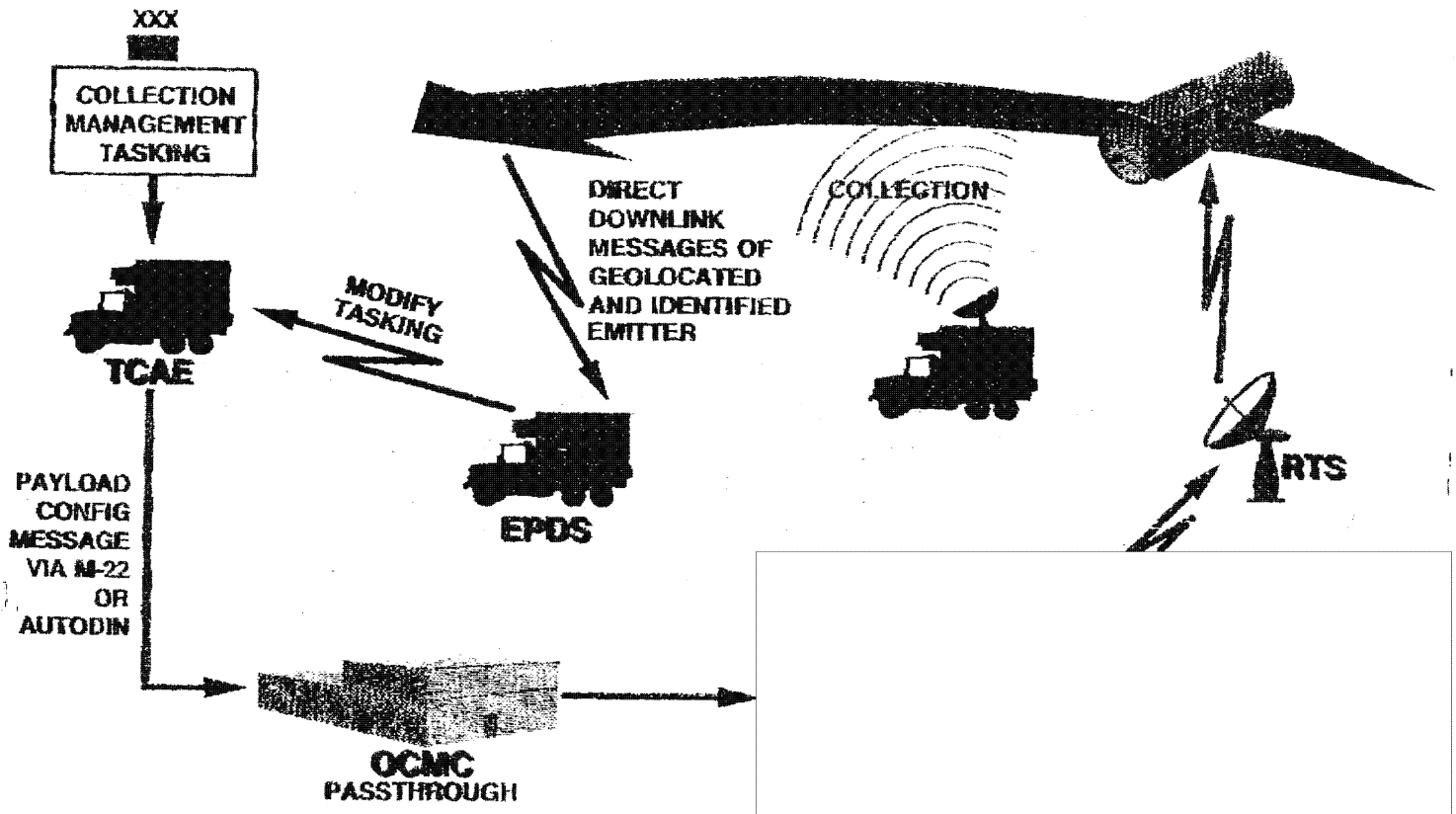
CARRIE TASKING SCENARIO



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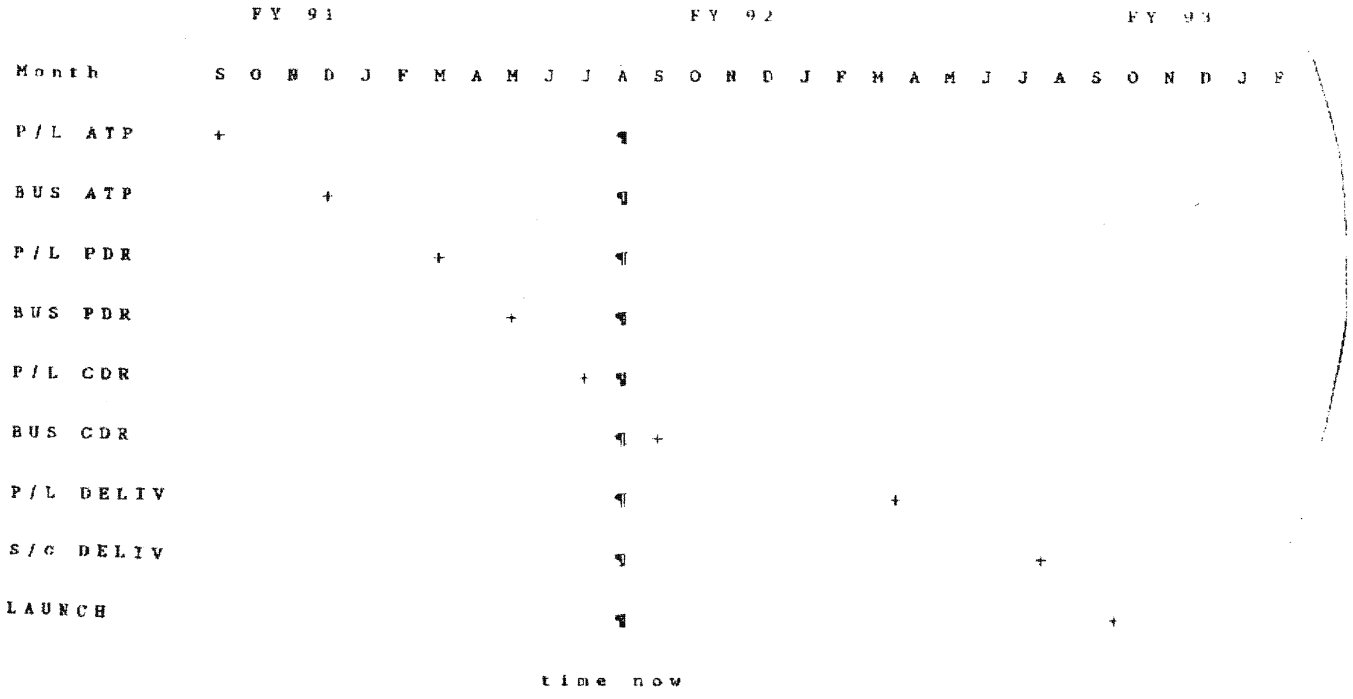
CARRIE SCHEDULE



this is a placeholder, we'll send a more attractive one first thing next week.

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SUMMARY

- **OBJECTIVES**
  - Satisfy Real Mission Requirement
  - Demonstrate tacsat concepts
  - Demonstrate new processing technologies
- **PLANNED CAPABILITIES**
  - Onboard COMINT geolocation & identification
  - Downlink directly to EPDS van
- **OPERATIONAL TIME FRAME**
  - Launch - Oct 1992
  - Available for Demos - Oct 92 through Sep 93

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- **ADVANCED TECHNOLOGY**

BACK UPS

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- ADVANCED TECHNOLOGY
  - PAYLOAD PROCESSOR CPU (TI TMS320C30)
    - Commercially available, rad hard, 12 MIP machine
    - Designed for intensive high speed digital signal processing
    - Reprogrammable by electronically erasable (E^2) PROM
  - PAYLOAD ALGORITHMS
    - Co-channel interference determination
    - Sets thresholds without knowing noise floor
    - Real-time phase reconstruction ("on the fly")
  - GPS RECEIVER
    - DARPA funded, six channel system
    - 8 lbs, 15 Watts, RS232 interface
    - OBP accomplished without ground generated ephemeris

CARRIE TASKING SCENARIO

- DATES AND LOCATIONS OF DEMONSTRATIONS ARE PREPLANNED
  - Streamlined tasking chain authorized by prior agreement
  - Dates, time of passes through target are determined in advance by orbital mechanics
  -
  -
  -
  - User must request payload configuration from "menu" at least 90 min prior to RTS contact preceding AOI visibility