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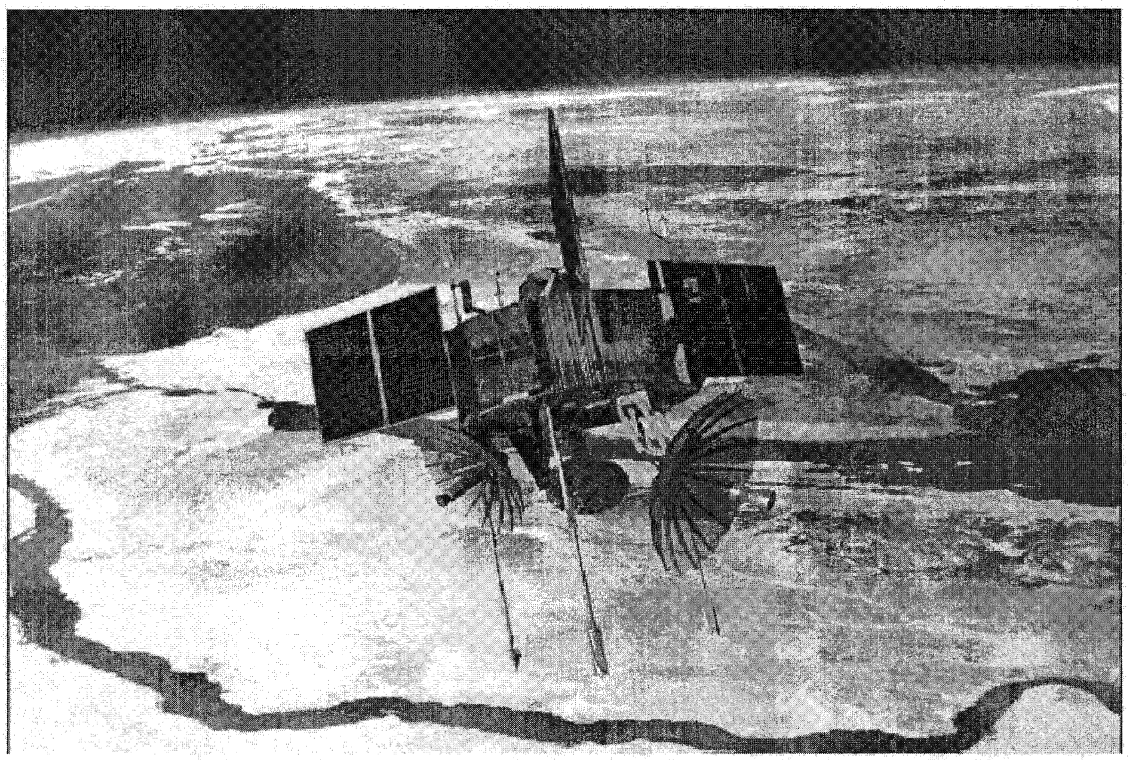
Program Update

25X1



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25X1

Outline

- Current Status
- Life Limiting Factors
- Program Attributes
- Future Outlook
- Program Update Wrap-Up
- Space Technology Experiment (STEX)

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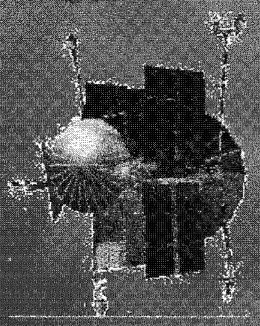
25X1

Current Status: FARRAH I (M7346)



Payload

	Direction Finding		Omni		Technical Intelligence	
	PULSE	CW	PULSE	CW	PULSE	CW
Band 1						
2						
3						
4						
5						
6						
7						
8						

[redacted]

Bus

Command & Control
Degraded -Y Antenna
Back-up DCU

Power
Batteries 14% capacity
Data Handler -- Always on
Requires Hi Power C&C Xmitter

Store and Forward (T/R)
All Tape Recorders Failed

Thermal

Attitude Control

Major Events:
- Currently in 64% sun & decreasing

Launched 11 May 1982

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25X1

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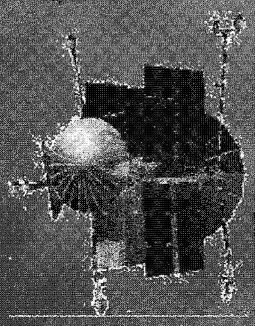
25X1

Current Status:
FARRAH II (M7347)



Payload

	Direction Finding		Omni		Technical Intelligence	
	PULSE	CW	PULSE	CW	PULSE	CW
Band 1						
2						
3						
4						
5						
6						
7						
8						

[redacted]

Bus

Command & Control
Degraded +Y Antenna
Failed -Y RF Path

Power
Batteries 14% capacity

Store and Forward (T/R)
All Tape Recorders Failed

Thermal
Seasonal Maneuvers
Required for Thermal/Power

Attitude Control

Major Events:

- Currently in 63% sun
- ACS completed 24 Mar

25X1

Launched 25 June 1984

SECRET HVBCCO

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25X1

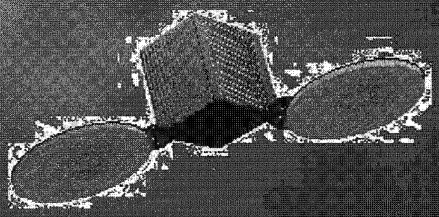
Current Status: CARRIE (M7245)

Payload

100 - 850 MHz
COMINT Mapper

Major Events:

- Next 100% sun 26 Jun



Bus

- Command & Control
- Power
- Databank
- Thermal
- Attitude Control

Launched 13 March 1994

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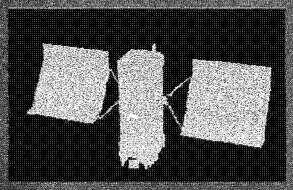
Current Status: STEX (M7248)

25X1



Payload

- Virtual Pre-Configured Interface (P/L A)
- Advanced Technology Experiments (P/L B)
- Experimental EHF Collection 26 - 40 GHz (P/L C)
- Advanced Tether Experiment (P/L D)

Bus

- Command & Control
- Power
  - Solar Array Output Decreased
- Thermal
- Attitude Control
  - TGA #1 Failed 21 Jan 99

Major Events:

- Entered 100% sun 27 Mar
- [redacted] 25X1
- Decrease in total Solar Array output since launch. Cause under investigation.

Launched 3 October 1998

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25X1

F-I & F-II VALUE ADDED

- Increased Collection Coverage
- Decreased Max Gaps in Coverage
- Improved Revisit Over Target Areas
- Allows for Greater Flexibility in M7300 Spacecraft Receiver Configuration

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SECRET

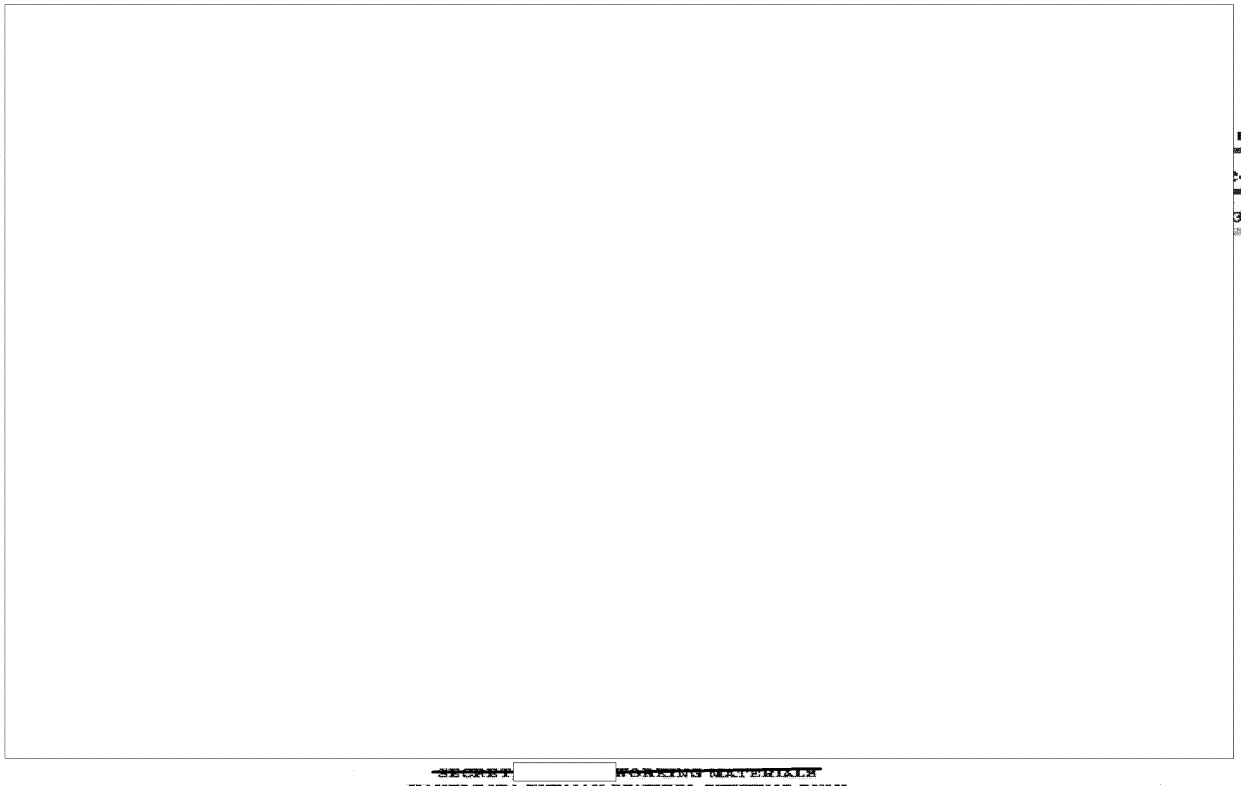
F-I TASKING

25X1

25X1

SECRET [redacted] FOREIGN MATERIALS DOCID 10/01/89

25X1



SECRET [redacted] FOREIGN MATERIALS
HANDLE VIA FOREIGN CONTROL SYSTEMS ONLY

25X1

SECRET HVBCCO

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25X1

F-II TASKING

~~SECRET~~ ~~HANDLING MATERIALS~~ 25X1

25X1

~~SECRET~~ ~~HANDLING MATERIALS~~
~~HANDLE VIA BYEMAN CONTROL SYSTEMS ONLY~~ 25X1

~~SECRET HVBCCO~~

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25X1

COLLECTION PERCENTAGES

25X1

- **234 Signals Collected Over [redacted] That Were Shipped R203, From 20 Mar 99 to 7 Apr 99**
  - **43 (18.4%) collected by F-I**
  - **15 (6.4%) collected by F-II**

25X1

[redacted]

~~SECRET HVBCCO~~

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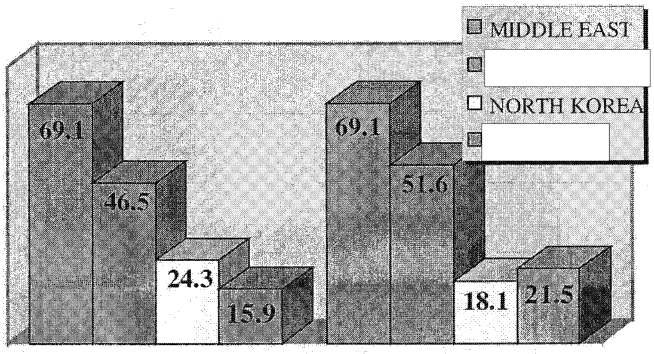
25X1

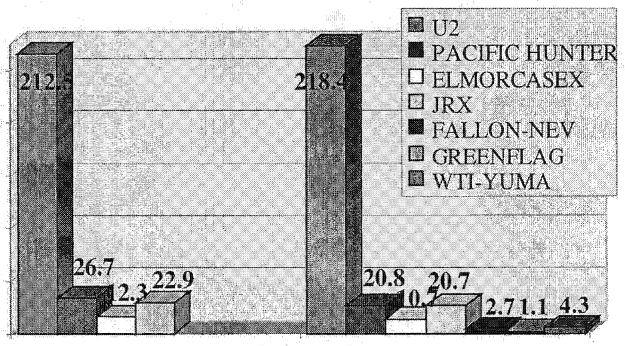
Current Status: M7300, 6 Apr 99

Vehicles	ROL/AOL	MCC 3/12
G	G	G

Outages/Comments: All Nominal

	Last 24 Hours	Lost	Delay	Next 24 Hours
RRR Total				
SPX Total				
NTC Total				
CARRIE				
TOPS				





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25X1

Life Limiting Factors

- **Non-Manageable Areas**
  - **Projected Life Post 2006**
    - **Solar Array Degradation**
    - **Thermal Surface Degradation**
    - **Parts Failure**
    - **Re-Entry Date (CARRIE)**

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25X1

Life Limiting Factors

- **Manageable Areas**
  - **Batteries**
  - **Tape Recorders (FARRAH)**
  - **Maintaining an Experienced/Dedicated Workforce**

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25X1

Life Limiting Factors: Batteries

- **F-I & II**
  - Increased use has stabilized capacity at approximately 14% of initial value
  - Should support current mission levels through 2006
- 25X1
-
- **CARRIE**
  - Approximately 70% and 40% of initial values
  - Should support 1998 mission levels through 2000+ (?)

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25X1

Life Limiting Factors:
Experienced/Dedicated Workforce

- **Actively Working to Maintain Motivated Workforce**
  - **Mission Planning Upgrade**
    - **DEC to SUN Migration**
    - **Intensive Training Underway**
  - **Addition of [redacted] Mission**
  - **Remodeling Mission Control Complex**
  - **Cross-Training Personnel**

25X1

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25X1

Program Attributes

- Cost Effective
- Polar Coverage
- Revisit Time
- TOPS (Real-time Data to Warfighter)
- Ability to Capture Low Power Emitters
  - Low Orbit (Link Closure)
  - RF Sensitivity
- Analyst Certified Data
- Monopulse Geolocation
- Solid, Reliable Vehicles

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25X1

Future Outlook

- **Changes in Operations Philosophy**
- [redacted] 25X1
- **Manning Profile**

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25X1

Future Outlook: Changes in Ops Philosophy FY 2000-2001

- **Two Simultaneous ACTIVE Supports** — **Done**
- **Transfer PASSIVE Supports to OD-4/DZ** — **Done**
- **MC Assume Some PA Functions** — **Jun 99**
- **Solo ACTIVE Supports (selected)** — **Jun 99**
- **Modify SOH Requirements** — **Done**
- **Reduce Frequency of TOPS Memory Dumps** — **Study**
- **Program Tape Recorder Readouts** — **Apr 99**
- **Semi-freeze Software Baseline** — **Y2K**

25X1

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25X1

Future Outlook: Changes in Ops Philosophy FY 2000-2001 cont.

■ Optimize STEX vs [redacted] Use	TBD
■ Revise [redacted] WDR Tape Stacking Logic	Study
■ CDC 2000	Underway
■ Ship Analog Tapes Directly to [redacted]	Apr 99
■ Streamline Comm	In Work
■ Modify OA Shift (2x8hr to 1x12hr)	Study
■ Consolidate Management Functions	In Work

25X1

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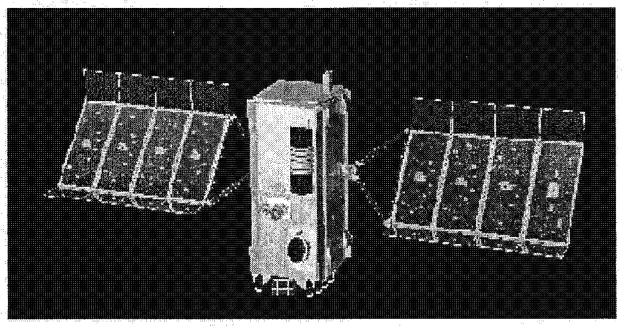
25X1

Space Technology Experiment (STEX)

- **Status Update**
- **Recommendations**



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25X1

Current Status

Current Vehicle Status

- All AS&T Primary Experiments have been Completed
- Vehicle Commanded to [redacted] 25X1
- Solar Array Output Capability Degraded ~50%
  - Current Solar Array Output is 12.9 Amps
  - Projected Solar Array Output with no Further Degradation at 0 beta is 12.5 Amps
- Currently in 100% Sun Period (27 Mar - 29 Apr 99)

Significant Events In Last 30 Days

- Performed Orbit Raise to 10 nmi below F-III (Extended Rendezvous window)
- Took Preventive Measures to Slow Solar Array Degradation

Upcoming Significant Events

- Rendezvous [redacted] on 1 Jun 99 (Begin Orbit Raise on 17 May 99) 25X1
- Minimum Sun Period (4 - 18 Jun 99)

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25X1

Solar Array Mitigation Plan

- Probable Cause of Solar Array Degradation is High Temperatures on Panels
  - 152°C when Producing Power
  - 167°C when Shunting
  - 204°C when Shadowed
  - 179°C - Solder used for Solar Cell Connections Melts

- Preventive Measures Taken
  - To Prevent Shunting - Manually Increased Load on Vehicle to Prevent Battery Top-off
    - LMA working on FSW Patch to Control Loads
  - To Prevent Shadowing and Non-uniform Illumination on Solar Panels (only happens above 49° Beta) - Pointed Vehicle Toward Sun
    -

25X1

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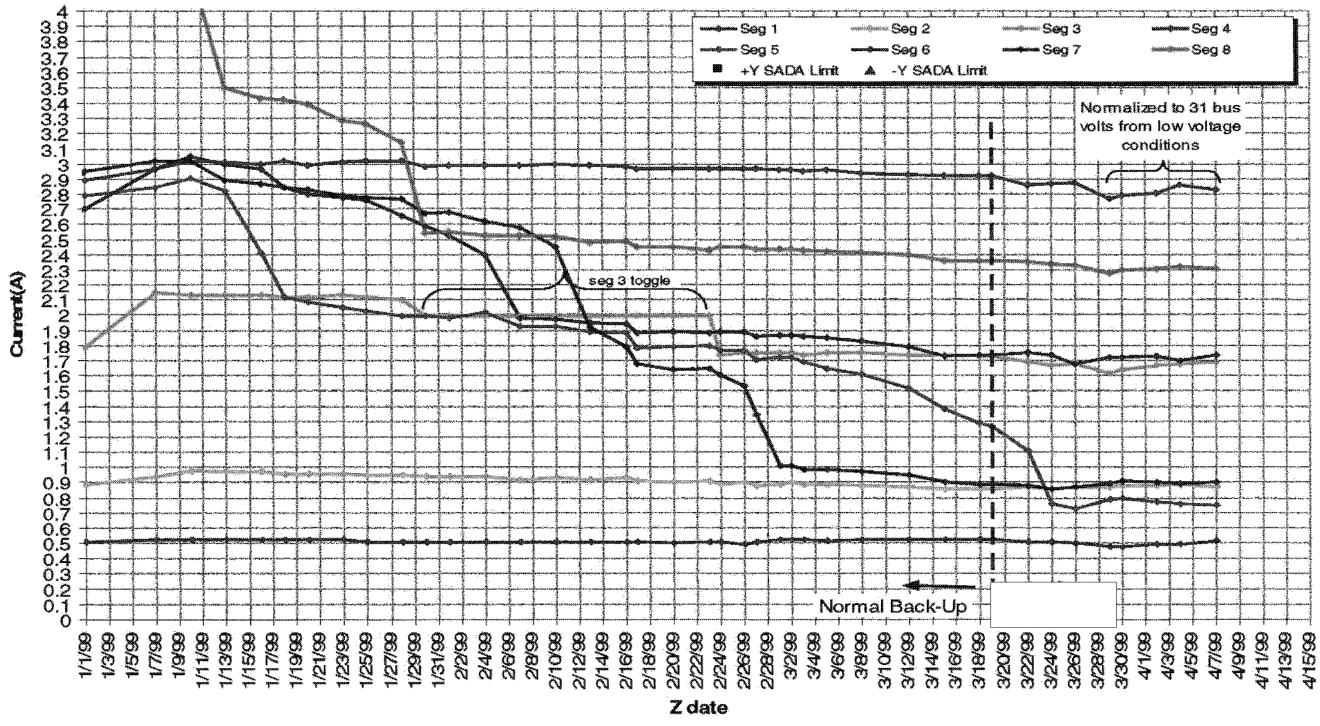
Solar Array Segments

25X1

STEX S/A Segments - Average Current in Normal Backup

25X1



25X1

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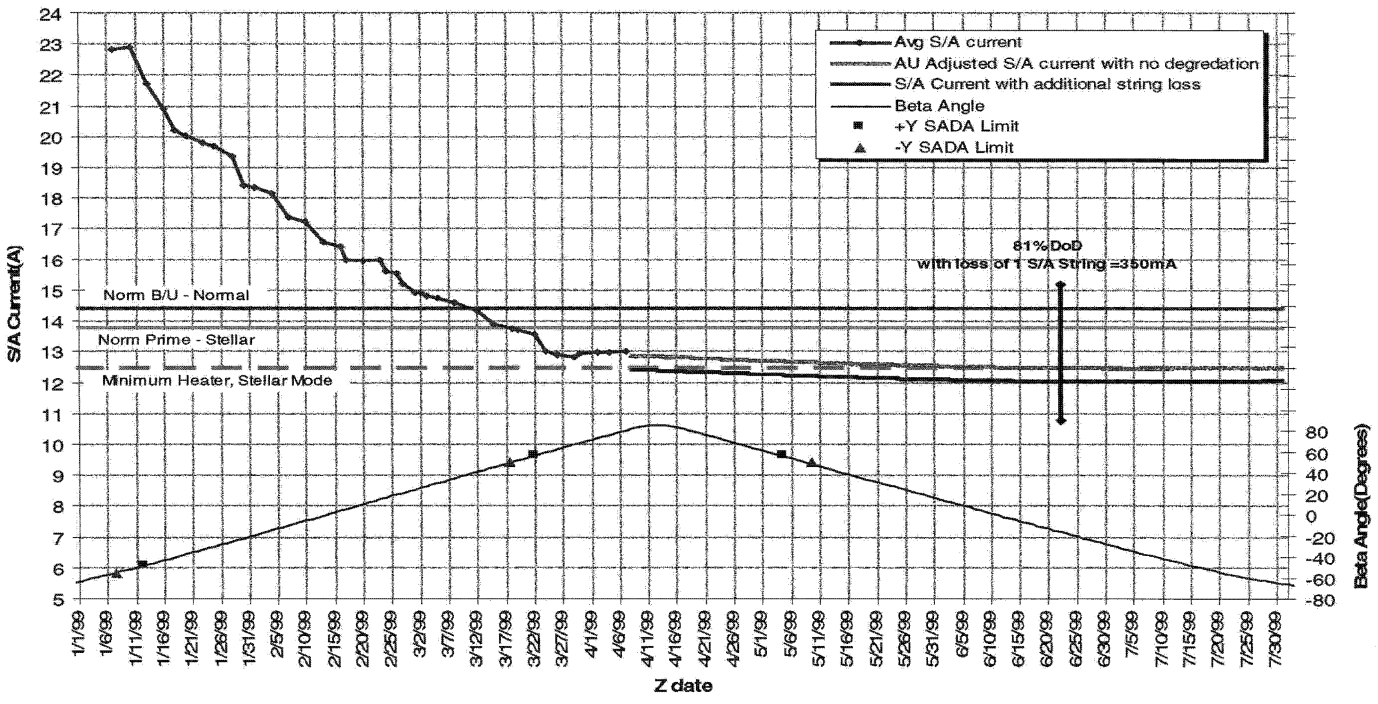
Solar Array Current

25X1

25X1

STEX S/A Current - Avg operating current in Normal Backup



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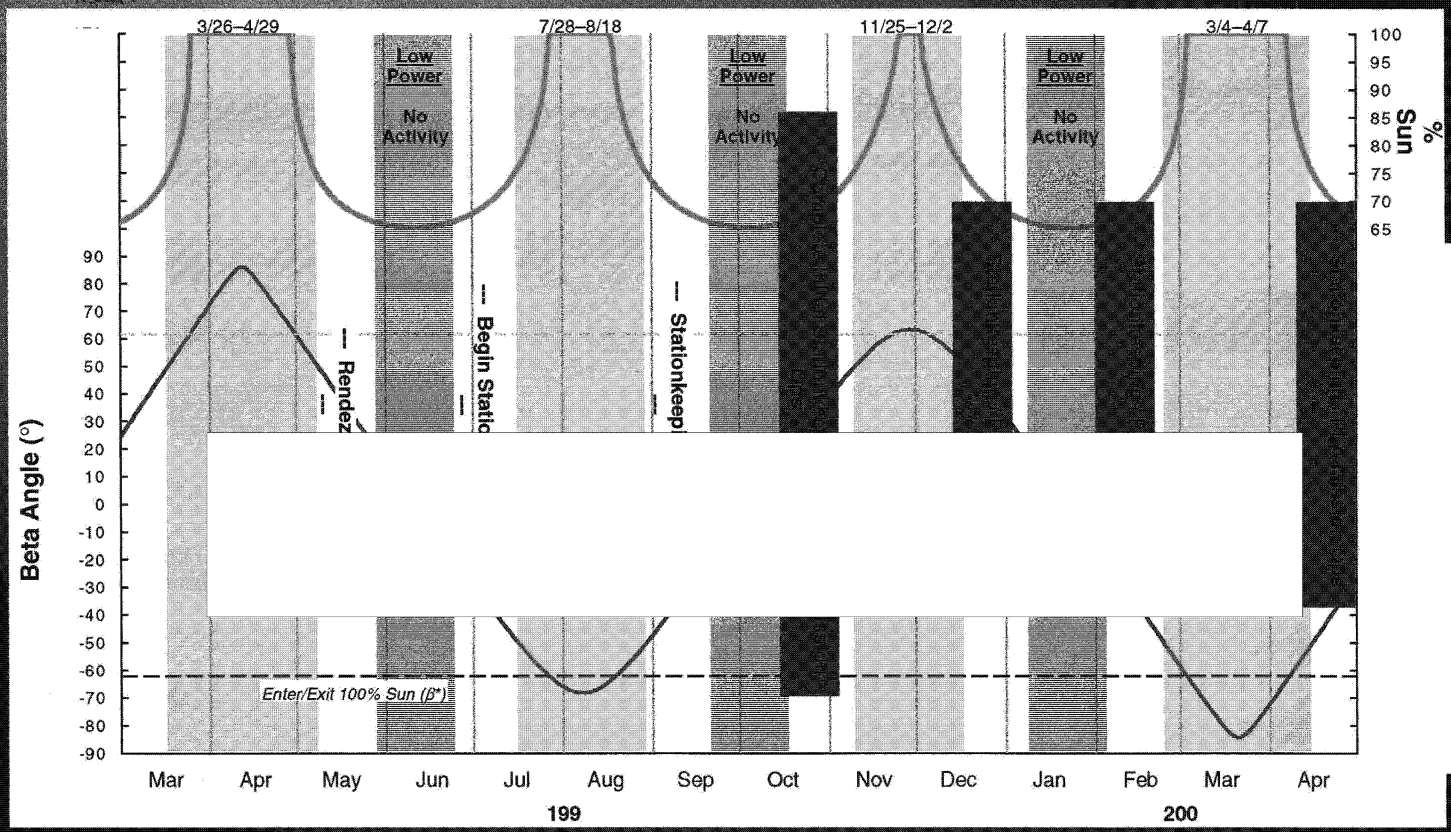
Thermal Environment



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25X1

25X1

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25X1

Payload-A Operations

Benefits:

1 Year VPCI mission = 3.5 months extension in projected [redacted] *tape cycle life*

(Assumes Best Case: 90% reduction in [redacted] Tape Cycles for Assured VPCI Mission Periods from Nov 99 to Nov 00)

25X1

Consequences:

- Vehicle Maintenance Requires HIGH Level of Eng and Ops Support
- Vehicle Engs not Providing Full Support on other Operational vehicles
  - 4.5 Engineers Supporting STEX (planned for 2 engineers)
    - No Resources added to [redacted] Program to Cover Additional Workload
  - Additional Risk to FARRAH Vehicles
- Possible Impact to the 2 Simultaneous ACTIVE Supports Rule if more Supports are Required for STEX Maintenance
  - Impacts Operational Manning
  - Possible Impacts to Tasking on Other Vehicles

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VPCI Mission Technical Risks

25X1

- **No Further Degradation**
  - **During Rendezvous**
    - Low Risk
      - Batteries Should Recover Prior to Minimum Sun Period
  - **During Continued Operations**
    - Medium-to-High Hisk
      - [redacted] Altitude with Limited Separation
      - Flight through Minimum Sun would Require Safeties to be De-activated
      - Further Degradation at this point would Require Immediate Lowering to Decommission Altitude
        - May be Unable to Perform if in Minimum Sun
  - **During Decommissioning**
    - Low-to-Medium Risk
      - No Problem if Outside the Minimum Sun Period
      - May be Unable to Perform if in Minimum Sun

25X1

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VPCI Mission Technical Risks

25X1

- **Single String Loss**
  - **During Rendezvous**
    - High Risk
      - Vehicle would be at or near [redacted] Altitude at Time of Power Depletion
      - Battery Capacity would Continue to Decrease during Minimum Sun Period
      - Loss of Vehicle from Battery Capacity Depletion before Exiting Minimum Sun
  - **During Continued Operations**
    - High Risk
      - At [redacted] Altitude with Limited Separation 25X1
        - Loss of Power further Burdens Efforts to Maintain Control (FSW Patches)
      - Flight through Minimum Sun would not be Possible
        - Loss of Vehicle from Battery Capacity Depletion
      - Immediate Lowering to Decommission Altitude would be Required
        - May be Unable to Perform if in Minimum Sun
  - **During Decommissioning**
    - Medium-to-High Risk
      - No Problem if outside the Minimum Sun period
      - Unable to Complete Lowering of Vehicle, if required, in Minimum Sun
        - Loss of Vehicle from Battery Capacity Depletion prior to Completion

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25X1

Recommendations

- **Terminate Plans to Rendezvous with [redacted] Immediately**
  - **Risk to [redacted] and other Vehicles (limited resources) Outweigh Gains to Payload-A Operations**

25X1

- **Develop and Get Approval for Decommissioning Execution Plan based on Decommission Guidance**
  - **Provide AS&T a Period to do any Additional Performance Testing**
  - **Implement Decommission Plan**
- **All Critical Operations must be Complete by ~29 May (predicted) to Assure Adequate Power Margin**
- **Early Decision Allows Us to do Experiments & Reprogram resources**

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