

Student Satellite Project

UASat Progress Review

Tracking, Telemetry and Command (TTC)

January 26, 1999

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Tracking, Telemetry & Command

Overview

- Subsystem Overview
- Block Diagram
- Systems Level Requirements Review
- SEDSat Operational Profile
- Plans for Spring 99

Subsystem Overview

- Amateur Radio Satellite Frequencies
 - Data downlink: 2.4 GHz Amateur band
 - Command uplink: 1.2 GHz Amateur band
 - Pacsat store-and-forward
 - Uplink: 2m Amateur Band
 - Downlink: 70cm Amateur Band

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- **Data Rates and Modulation Schemes**
 - Primary downlink
 - up to 2Mbps QPSK
 - Primary uplink
 - 9600 bps QPSK
 - Pacsat system
 - 9600 bps FSK

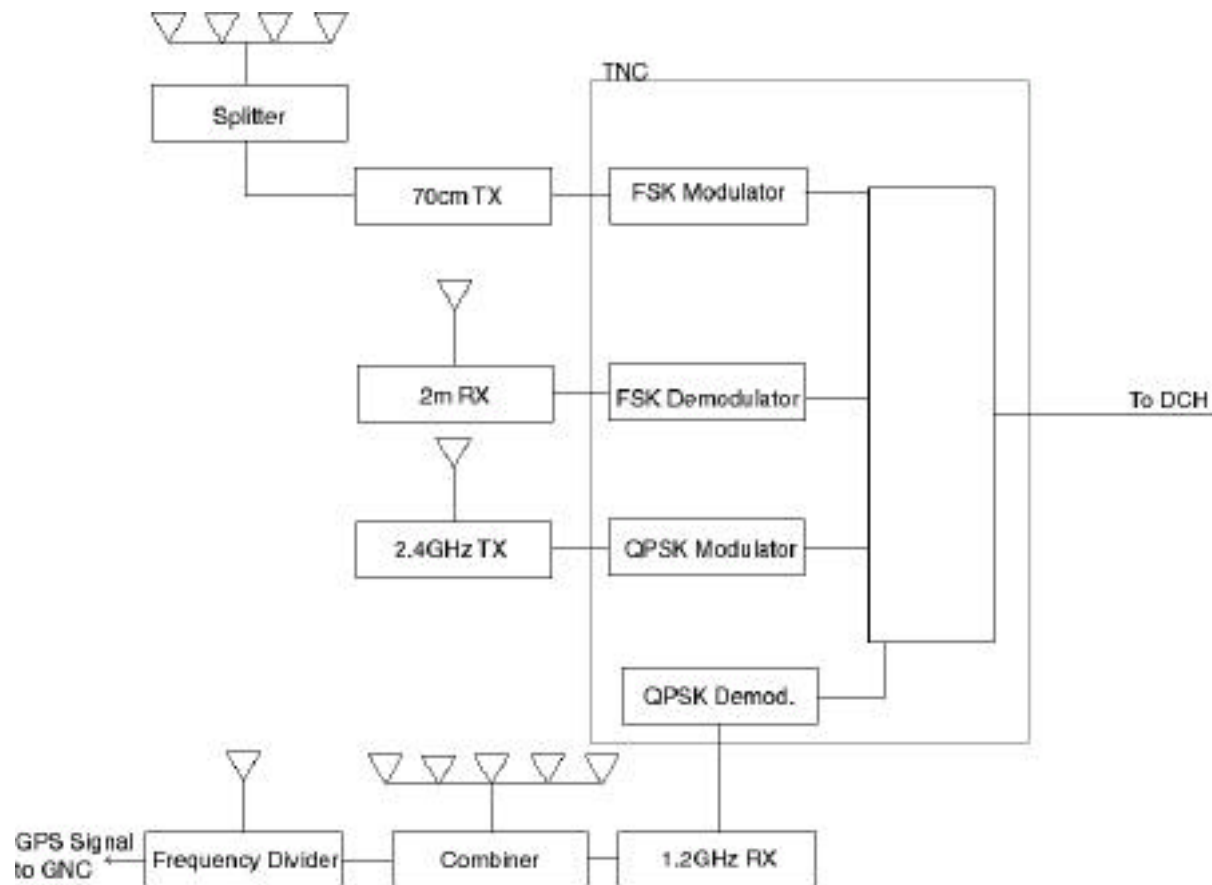
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- **Downlink RF Power Outputs**
 - Telemetry Downlink: 400mW
 - Pacsat Downlink: 900mW
 - **Spacecraft Antennas**
 - Uplink Design: Array of 6-1/2 wave monopoles
 - Downlink Design: Deep parabolic
 - Pacsat Design: 2m monopole & 70cm turnstile

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Block Diagram



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Systems Level Requirements Review (SLRR)

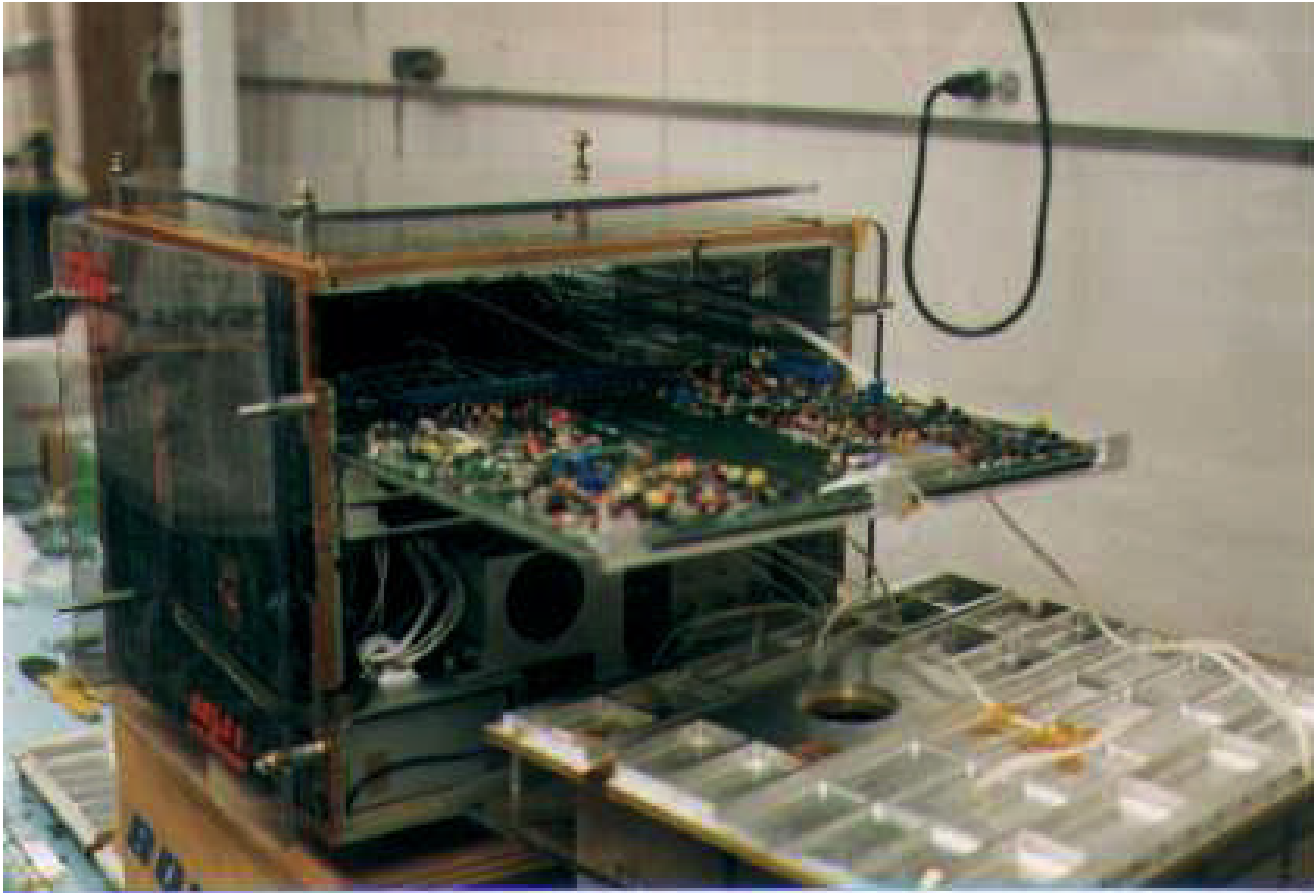
- Held August 18, 1998
- Major Requirement
 - Terminal Node Controller (TNC) must be able to downlink a Quadrature Phase Shift Keying (QPSK) modulated signal needed to get all science and telemetry data acquired within 4 orbits to the ground within a standard pass time of 7 minutes (@ 2Mbps = 105 MB)

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SEDSat Operational Profile

- Launched Oct-24-1998 05:08:00.525 MST
- Groundstation Construction
- Groundstation Software
- SEDSat Problems
- Lessons Learned

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Plans for Spring 99

- DILSAT (Day In the Life of the SATellite)
- Antennas completely simulated/built
- Working Prototype

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