

7.1 Introduction (Continued)

Each of the major spacecraft bus subsystem modules on Paxsat are considered in turn. Section 7.5 presents the attitude and orbit control system required for Paxsat. The propulsion module for the Paxsat spacecraft baselining the rendezvous mission operation is considered in section 7.6. Section 7.7 presents a concept design for the power subsystem while section 7.8 discusses thermal control on the spacecraft. Finally, Section 7.9 presents a structure concept and an overall mass budget for the spacecraft.

A summary of the Paxsat spacecraft is presented in section 7.10 where the feasibility of the concept design is concluded.

7.2 Configuration

Figures 7-1 through 7-3 show an exploded view, an on-orbit view and a stowed view of a Paxsat conceptual configuration.

Four fuel tanks holding a total of 3,000 kg of fuel are placed in the center of a cruciform support structure.

The Attitude and Orbit Control Subsystem (AOCS) and Command and Data Handling Subsystem (C&DH) each occupy one of the sides of the cube formed by the exterior of the main support structure.

On the remaining two sides are mounted the solar arrays. The bottom of the cube contains the rest of the power subsystem as well as the interface ring to the launch vehicle.

The top face of the cube is left free for the sensor payload.

In the initial concept, the payload face is attached directly to the main support structure, with only enough clearance allowed to fit the propellant tanks, lines and valves underneath. However, should more payload mounting area be desired, the spacecraft could be stretched to allow equipment to be mounted on the underside of the payload face as well. This would effectively double the payload mounting area.