D1.0 <u>INTRODUCTION</u>

Complex low earth-orbiting satellites rely more and more on on-board computers to provide increased flexibility, spacecraft autonomy, and extended operational life.

These demands can be met by using a microcomputer with the following key characteristics:

(a) Adaptable to support different mission requirements,

(b) Modular multiprocessor design suitable for distributed processing,

(c) Interrupt driven, multitasking operating system for real-time applications,

(d) In-orbit reprogramming capability,

(e) Use of non-volatile memory for mass-storage of programs,

(f) Redundancy cross-strapping applied at the module level of the computer, and

(g) Fault-tolerance and selftest capability.

Current spacecraft designs are based on two computer implementation concepts. Major subsystems are controlled by a central computer, typically via the spacecraft data bus of the command and telemetry subsystem, and/or by dedicated computers which form an integral part of the subsystem.

The Paxsat computer described in this section falls into the former category.