PROTOTYPE DEVELOPMENT OF A MICROPROCESSOR-BASED ONBOARD ORBIT DETERMINATION SYSTEM

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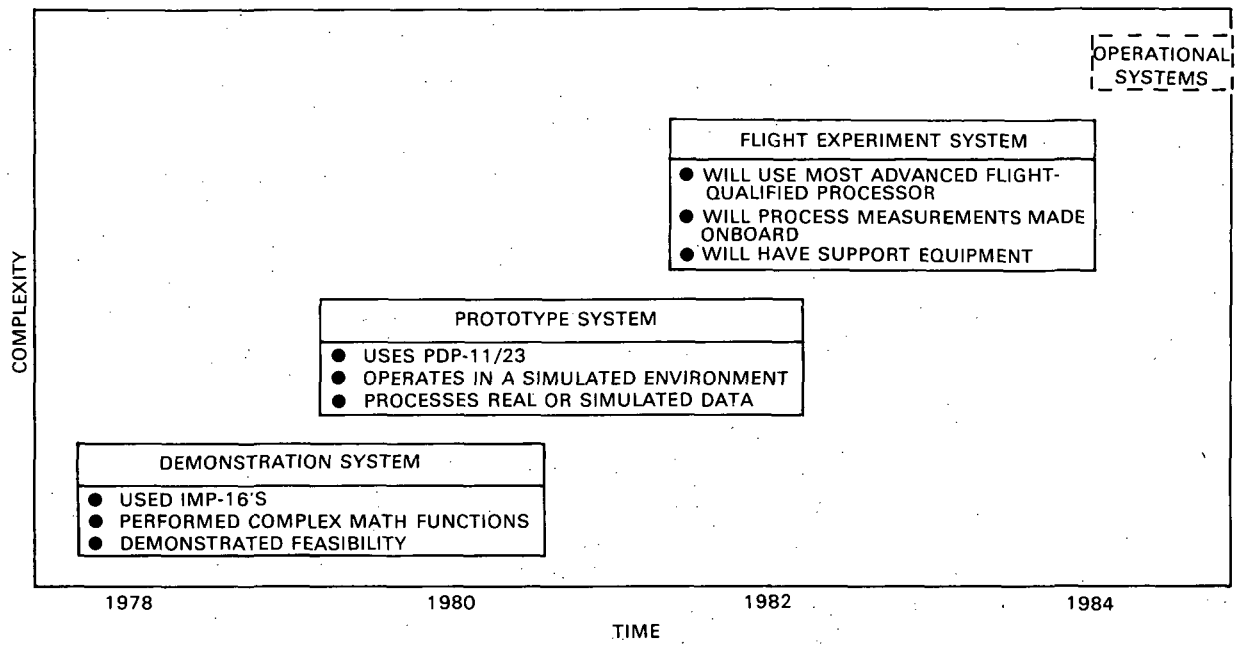
DEVELOPMENT STAGES OF ONBOARD ORBIT DETERMINATION SYSTEMS



OBJECTIVES

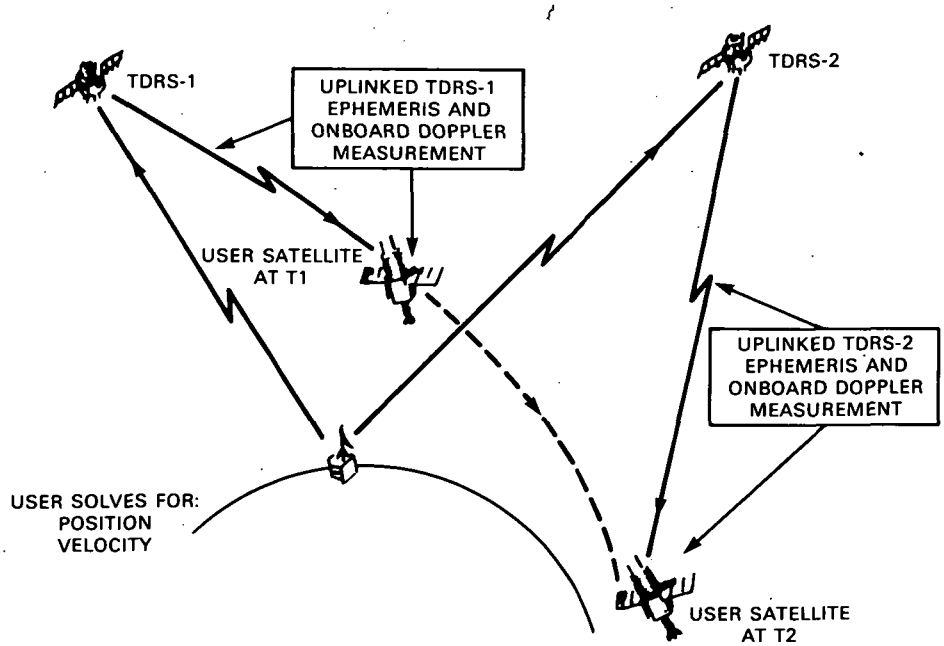
1. DEVELOP A MICROPROCESSOR-BASED AUTOMATED ORBIT DETERMINATION SYSTEM (AODS) USING:

   - PDP-11/70 AS THE DEVELOPMENT MACHINE
   - PDP-11/23 AS THE TARGET MACHINE
   - HIGH-LEVEL LANGUAGE - FORTRAN

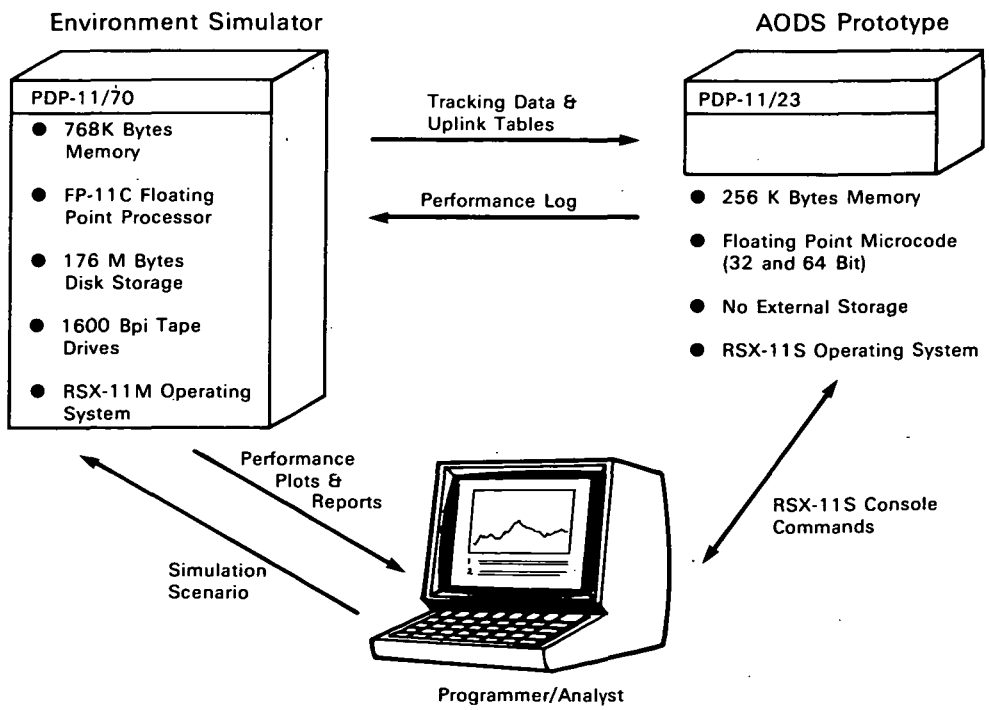
2. EXERCISE THE SYSTEM IN CONJUNCTION WITH A SIMULATOR.

3. REFINE SOFTWARE TO ACHIEVE HIGHER EFFICIENCY.

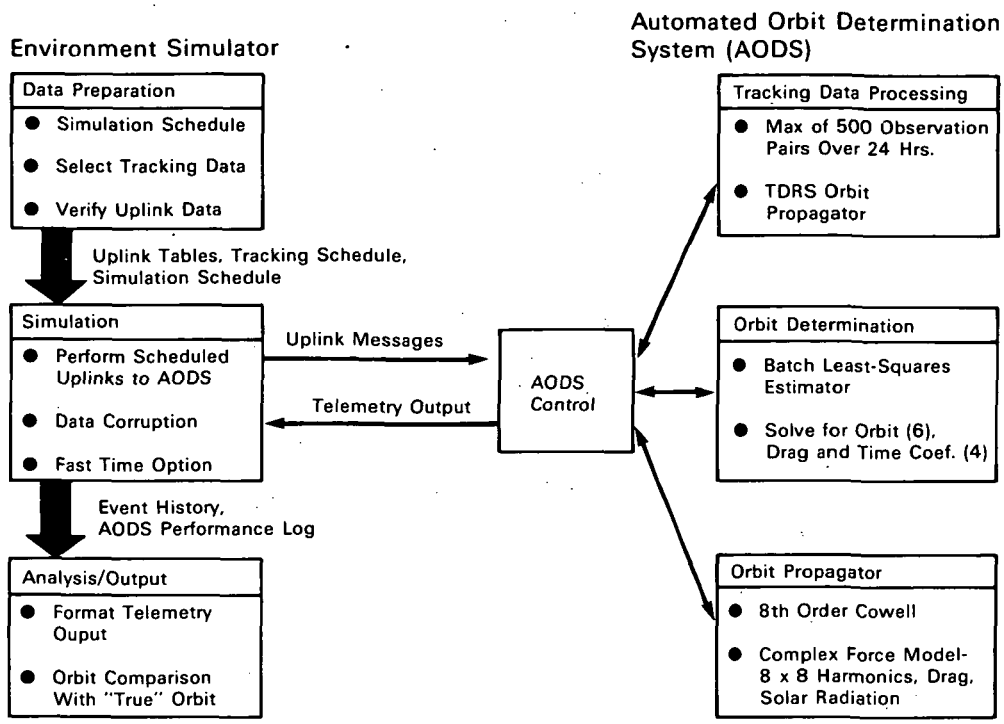
ONBOARD NAVIGATION WITH TDRSS



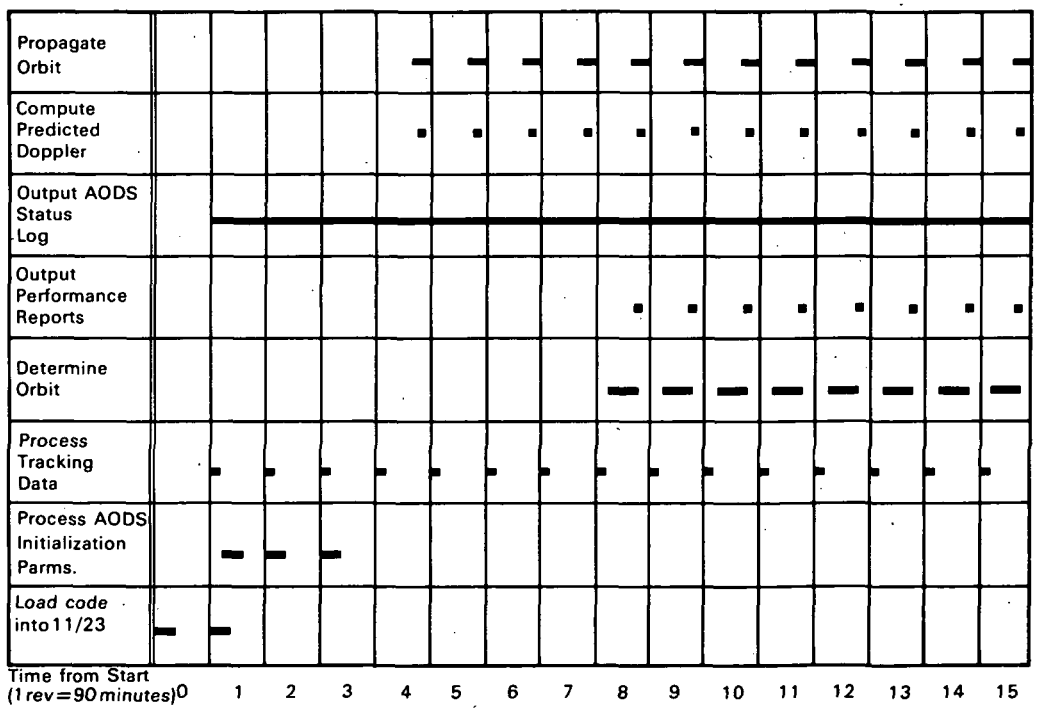
HARDWARE OVERVIEW



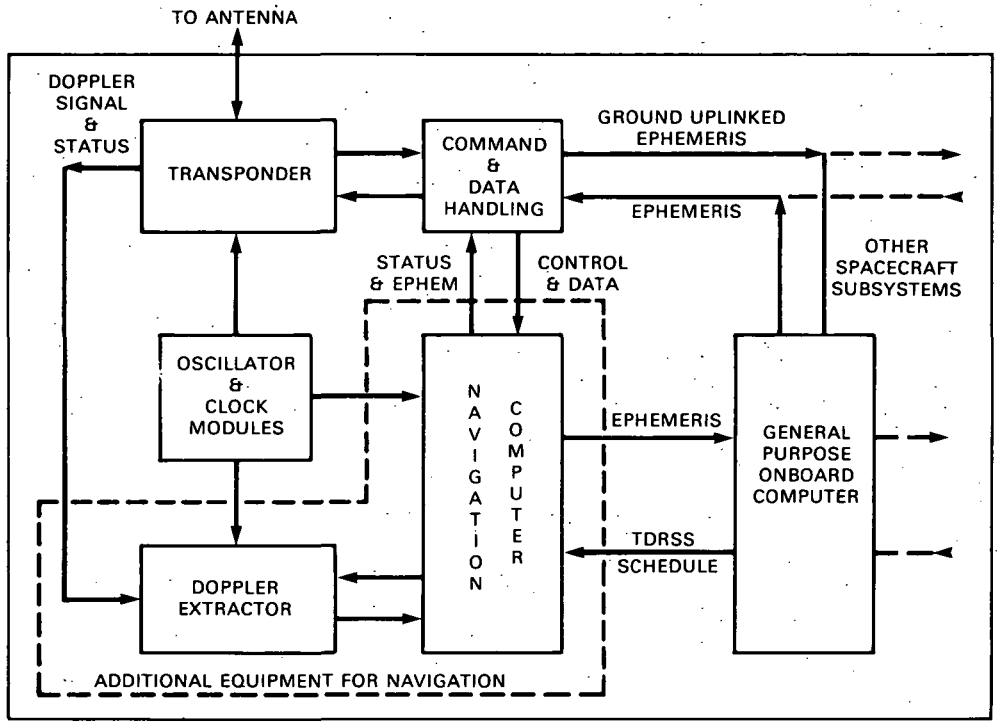
SOFTWARE OVERVIEW



TYPICAL AODS SIMULATION SCENARIO



FLIGHT EXPERIMENT CONFIGURATION



FLIGHT EXPERIMENT CONSIDERATIONS

1. SELECTION OF A FLIGHT-QUALIFIED PROCESSOR

   - 64-BIT FLOATING POINT ARITHMETIC
   - LARGE ADDRESSABLE MEMORY (BEYOND 64K)
   - MULTITASKING OPERATING SYSTEM

2. HARDWARE INTERFACE

   - RECEIVER - AODS - COMMAND AND DATA MODULE
   - AODS - OTHER ONBOARD PROCESSORS