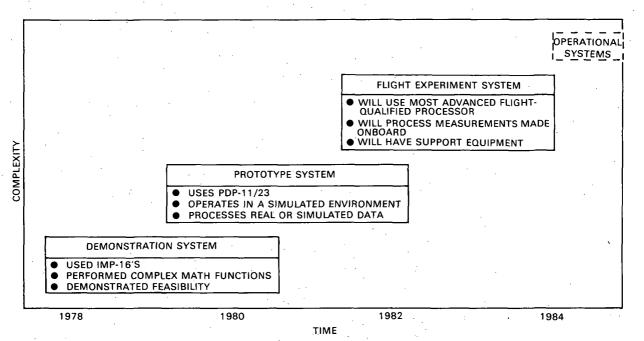
PROTOTYPE DEVELOPMENT OF A MICROPROCESSOR-BASED ONBOARD ORBIT DETERMINATION SYSTEM

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DEVELOPMENT STAGES OF ONBOARD ORBIT DETERMINATION SYSTEMS



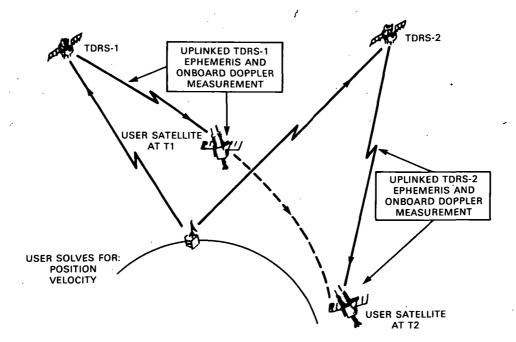
OBJECTIVES

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

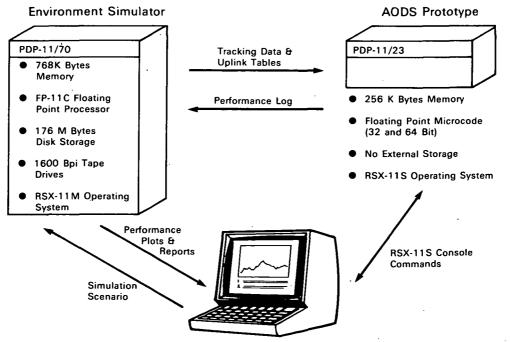
- PDP-11/70 AS THE DEVELOPMENT MACHINE
- PDP-11/23 AS THE TARGET MACHINE
- HIGH-LEVEL LANGUAGE FORTRAN
- 2. EXERCISE THE SYSTEM IN CONJUNCTION WITH A SIMULATOR.
- 3. REFINE SOFTWARE TO ACHIEVE HIGHER EFFICIENCY.

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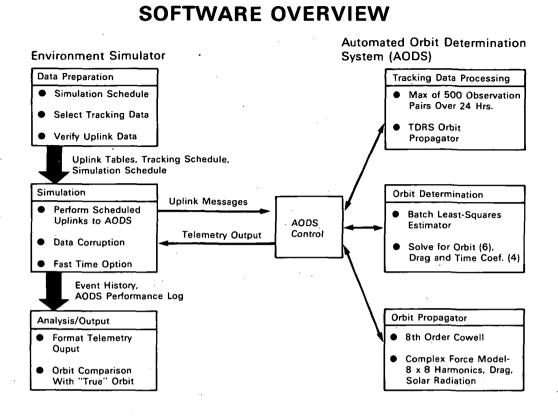
ONBOARD NAVIGATION WITH TDRSS



HARDWARE OVERVIEW



Programmer/Analyst

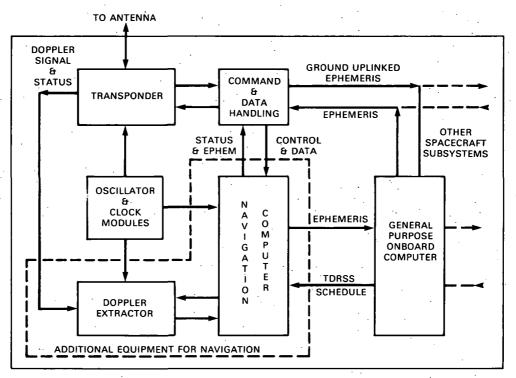


TYPICAL AODS SIMULATION SCENARIO

Propagate Orbit					-	-	- 1	-	-	-	-		-	_		-
Compute Predicted Doppler					•	•	•	•	•	•			•	•	•	•
Output AODS Status Log													-			
Output Performance Reports										•				•	•	
Determine Orbit										_	l	-		-	-	-
Process Tracking Data		•	•	•	•	•		•	•	•	•	•	•	•	•	.
Process AODS Initialization Parms.		-	-	-						_						
Load code into 11/23																
ime from Start 1 rev=90 minut	es)0	1	2	3	4	5 ,	6	7	8	9	10	11	12	13	14	15

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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