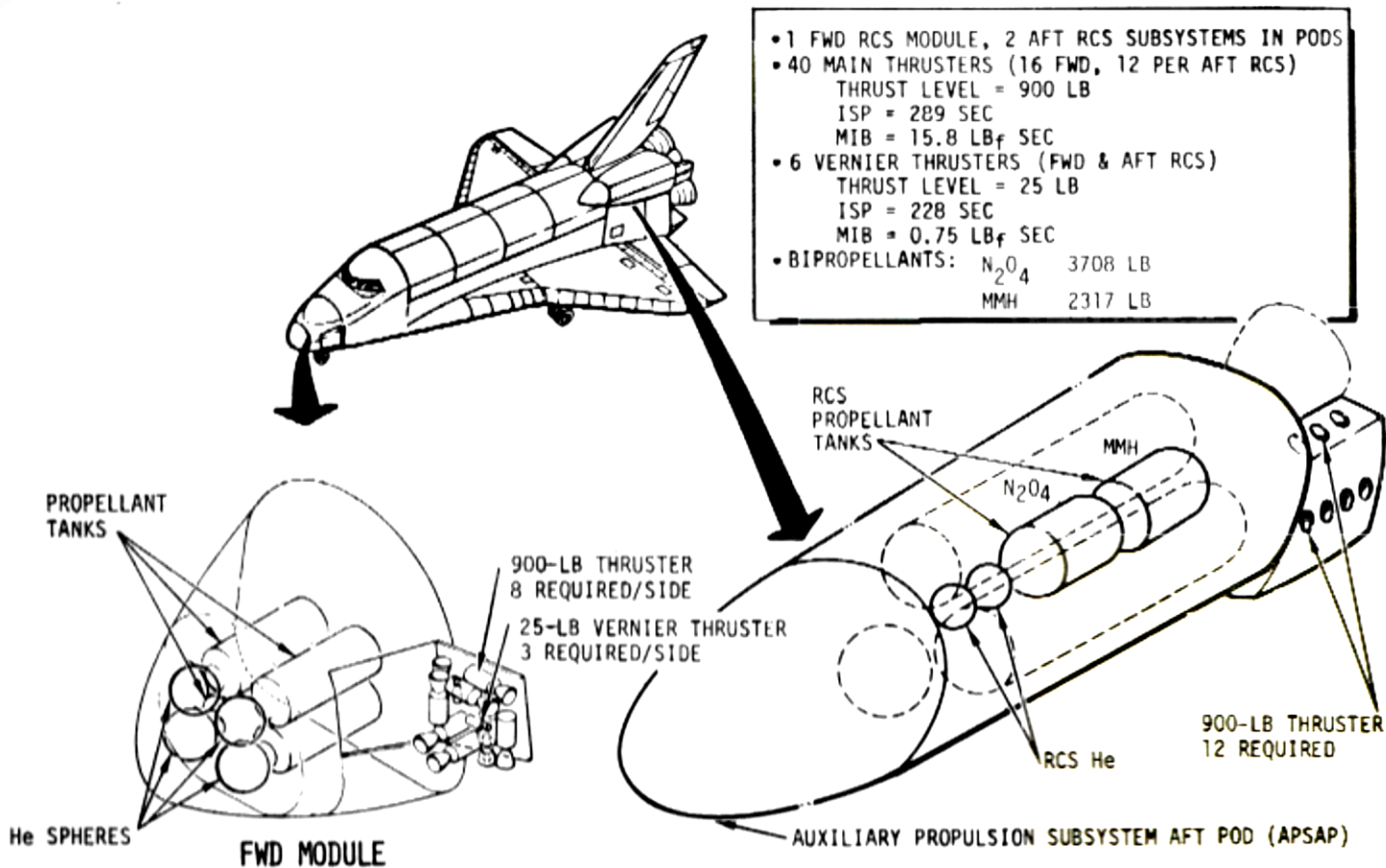


FIGURE 18

## ORBITER REACTION CONTROL SUBSYSTEM

SP-9



## ORBITER REACTION CONTROL SUBSYSTEM

(Figure 18 Text)

The orbiter reaction control subsystem (RCS) provides vehicle attitude control and translational capability for small velocity increments from just before external tank separation through all on-orbit maneuvers and during entry. The RCS is sized to furnish translational delta velocity ( $\Delta V$ ) of 190 feet per second for +Z axis rendezvous and the required rotational control accelerations for Mission 3B in fail-operational/fail-safe modes.

The RCS is grouped in three modules — one in the orbiter nose and one in each of the auxiliary propulsion subsystem (APS) aft pods, which also contain the orbital maneuvering subsystem (OMS). To minimize propellant requirements for extended missions and payload contamination, six vernier thrusters are located in the forward module. These vernier thrusters are used for limit cycle deadband control on all missions. The RCS employs fixed thrust, pressure-fed thrusters, and hypergolic propellants.

The RCS parameters and design features are:

Primary Thruster		Vernier	
Number	40 per vehicle	Thrust	6 per vehicle
Thrust level	900 lb	Thrust level	25 lb
Vacuum specific impulse	289 sec	Vacuum specific impulse	228 sec
Expansion ratio	20:1	Expansion ratio	40:1
Minimal chamber pressure	150 psia	Nominal chamber pressure	128 psia
		Fuel	MMH
		Oxidizer	N <sub>2</sub> O <sub>4</sub>
		Nominal mixture ratio	1.60:1