are made of aluminum-alloy, integrally stiffened and machined. The lower deck provides structural support for the ascent stage engine. The upper deck provides structural support for the docking tunnel and the overhead hatch.

Two main beams running fore and aft, integral with those above the crew compartment, are secured to the upper deck of the midsection; they support the deck at the outboard end of the docking tunnel. The aft ends of the beams are fastened to the aft bulkhead (-Z27.000), which has provisions for bolting the tubular truss members that support both aft interstage fittings. Ascent stage stress loads applied to the front beam are transmitted through the two beams on the upper deck to the aft bulkhead

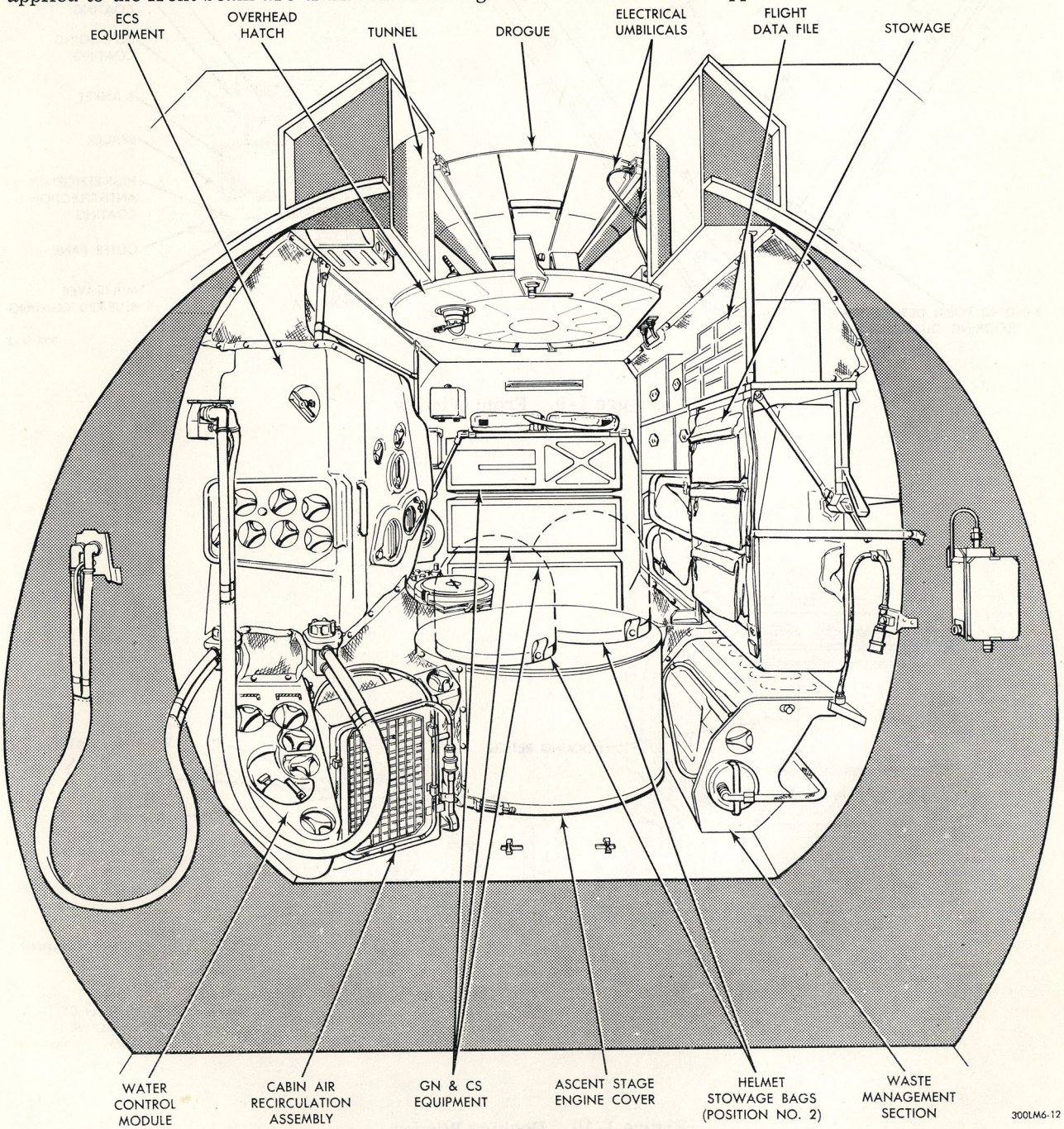

Figure 1-11. Cabin Interior (Looking Aft)

The food is vacuum packed in plastic bags that have one-way poppet valves into which the water dispenser can be inserted. Another valve allows food passage for eating. The food bags are packaged in aluminum-foil-backed plastic bags for stowage and are color coded: red (breakfast), white (lunch) and blue (snacks).

Food preparation involves reconstituting the food with water. The food bag poppet-valve cover is cut with scissors and pushed over the water dispenser nozzle after its protective cover is removed. Pressing the water dispenser trigger releases water. The desired consistency of the food determines the quantity of water added. After withdrawing the water dispenser nozzle, the protective cover is replaced and the dispenser returned to its stowage position. The food bag is kneaded for approximately 3 minutes, after which the food is considered reconstituted. After cutting off the neck of the food bag, food can be squeezed into the mouth through the food-passage valve. A germicide tablet, attached to the outside of the food bag, is inserted into the bag after food consumption, to prevent fermentation and gas formation. The bag is rolled to its smallest size, banded, and placed in the waste disposal compartment.

2.11.4.3 EMU Waste Management System. (See figure 2.11-8.)

The EMU waste management system provides for the disposal of body waste through use of a fecal containment system, and a urine collection and transfer assembly, and for neutralizing odors. Personal hygiene items are stowed in the right-hand stowage compartment.

2.11.4.3.1 Waste Fluid Transfer.

Waste fluids are transferred to a waste fluid collector assembly by a controlled difference in pressures between the PGA and cabin (ambient). On LM 5, the primary waste fluid collector consists of a long transfer hose, control valve, short transfer hose, and a 8,900-cc multilaminate bag. The long transfer hose is stowed on a connector plate when not in use. To empty his in-suit urine container, the astronaut attaches the hose to the PGA quick-disconnect, which has a visual flow indicator. Rotating the handle of the spring-loaded waste control valve controls passage of urine to the assembly. The 8,900-cc bag is in the PLSS LiOH storage unit; the short transfer hose is connected between the waste control valve and the bag.

With cabin pressure normal (4.8 psia), the long transfer hose is removed from the connector stowage plate and attached to the PGA male disconnect. The PGA is overpressurized by 0.8 ± .2 psia and the waste control valve is opened. Urine flows from the PGA to the collector assembly at a rate of approximately 200 cc per minute. When bubbles appear in flow indicator, the valve handle is released and allowed to close.

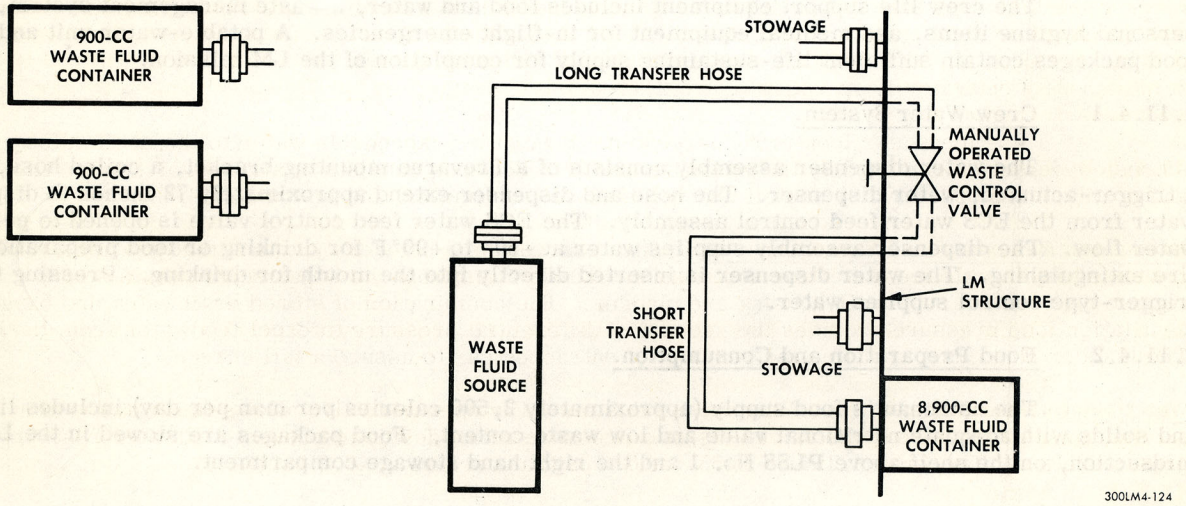

Figure 2.11-8. Waste Management System

On LM 6 and subsequent vehicles, the primary system for waste fluid collector system provides 900-cc waste fluid containers which attach directly to the PGA. Urine is transferred directly from the PGA, through the connectors, to the bags.

2.11.4.3.2 Fecal Device

The fecal containment system consists of an outer fecal/emesis bag (one layer of Aclar) and a smaller inner bag. The inner bag has waxed tissue on its inner surface. Polyethylene-backed toilet tissue and a disinfectant package are stored in the inner bag.

To defecate, the astronaut removes the inner bag from the outer bag. After unfastening the PGA and removing undergarments, the waxed tissue is peeled off the bag's inner surface and the bag is placed securely over the anal area. After defecating, the used toilet tissue is deposited in the used bag and the disinfectant package is pinched and broken inside the bag. The used bag is then closed, kneaded, and inserted in the outer bag. The wax paper is removed from the adhesive on the fecal/emesis bag and it is sealed then placed in the waste disposal compartment.

2.11.4.4 Personal Hygiene Items.

Personal hygiene items consist of wet and dry cleansing cloths, chemically treated and sealed in plastic covers, and packs of teeth-cleansing, ingestable chewing gum. The cloths measure 4 by 4 inches and are folded into 2-inch squares. They are stored in the food package container along with the chewing gum.

2.11.4.5 Medical Equipment.

The medical equipment consists of biomedical sensors, personal radiation dosimeters, and emergency medical equipment.

2.11.4.5.1 Bioinstrumentation.

Biomedical sensors gather physiological data for telemetry. Government-furnished impedance pneumographs continuously record heart beat (EKG) and respiration rate. Each assembly (one for each astronaut) has four electrodes which contain electrolyte paste; they are attached with tape to the astronaut's body.

2.11.4.5.2 Personal Radiation Dosimeters.

Six dosimeters are provided for each astronaut. They contain thermoluminescent powder, nuclear emulsions, and film that is sensitive to beta, gamma, and neutron radiation. They are placed on the forehead or right temple, chest, wrist, thigh, and ankle to detect radiation to eyes, bone marrow, and skin. Serious, perhaps critical, damage results if radiation dosage exceeds a predetermined level. For quick, easy reference each astronaut has a dosimeter mounted on his EMU. Dosimeters are government-furnished equipment.

2.11.4.5.3 Emergency Medical Equipment.

The emergency medical equipment consists of a kit of six capsules: four pain killers (Darvon) and two pep pills (Dexedrine). The kit is attached to the interior of the flight data file, readily accessible to both astronauts. The emergency medical equipment is government furnished.

2.11.5 CREW SUPPORT AND RESTRAINT EQUIPMENT. (See figure 2.11-9.)

The crew support and restraint equipment includes armrests, handholds (grips), Velcro on the floor to interface with the boots, and a restraint assembly operated by a rope-and-pulley arrangement that secures the astronauts in an upright position under zero-g conditions.

2.11.5.1 Armrests.

The armrests, at each astronaut station, provide stability for operation of the thrust/translation controller assembly and the attitude controller assembly, and restrain the astronaut laterally.

CREW-MAN	PNL	PROCEDURES	REMARKS
		4.13.7 WASTE MANAGEMENT WARNING If germicide pouch is accidentally ruptured, proceed as follows: • Germicide on LM surface or hardware - wipe up with tissue. • Germicide on crewman's skin - blot with tissue & flush with water. • Germicide in crewman's eyes - flush with water from water gun & blot with tissue. • Germicide ingested - take high-protein food; do not induce vomiting.	
		4.13.7.1 Installation of Large Urine Collection Assembly	Assumption: Large urine collection assembly is installed in waste management section prior to earth launch. Procedure may be performed by either or both crewman.
		1. Disconnect LM connecting hose from waste management tube cover and remove cover from tube. 2. Remove urine collection assembly from tube and stow. 3. Remove large urine collection assembly from stowage. 4. Place large urine collection assembly part way into waste management tube. 5. Insert connector through tube cover. 6. Connect LM connecting hose to collection assembly connector on tube cover, and install cover on waste management tube.	
		4.13.7.2 Transfer Urine to Waste Management System	Assumptions: Large urine collection assembly is installed in waste management system, and crewman are wearing helmet and gloves.

CREW-MAN	PNL	PROCEDURES	REMARKS
		4.13.7.2 Transfer Urine to Waste Management System (cont)	
		1. Remove urine transfer hose from stowage, expose PGA urine connection, & connect hose to PGA.	Alternate method of transferring urine from PGA is to manually squeeze fluid from Urine Collection Transfer Assembly (UCTA). Omit steps 2 thru 4, and step 8, if this method is used.
	ECS	2. SUIT GAS DIVERTER vlv - PULL EGRESS	Sequence in steps 2 and 8 should be performed as shown. If sequence is changed, suit fan may stall and water separator may slow down causing: MASTER ALARM - on ECS caut lt - on SUIT FAN comp caut lt - on H2O SEP comp caut lt - on
		CABIN GAS RETURN vlv - EGRESS SUIT CIRCUIT RELIEF vlv - CLOSE PRESS REG A vlv - DIRECT O2	PRESS REG B vlv can be used in lieu of PRESS REG A vlv.
		3. ECS: SUIT PRESS ind - 0.5 to 0.75 psi above CABIN PRESS ind	
	ECS	4. PRESS REG A vlv - CABIN	
		5. Waste management vlv - OPEN and hold.	Valve is spring-loaded to CLOSE.
		6. Monitor flow via sight gage in transfer hose.	
		7. Waste Management vlv - close when transfer is complete	
		8. SUIT CIRCUIT RELIEF vlv - AUTO CABIN GAS RETURN vlv - AUTO SUIT GAS DIVERTER vlv - PUSH CABIN	
		9. Disconnect urine transfer hose from PGA & stow.	
		10. Install PGA connector cap.	