operationally self-contained, but all information is shared in parallel with the others. The primary function of the computers is to analyze all navigational data and control the propulsion systems according to the preprogrammed mission plan. In addition to flight details, all medical, environmental control, and food storage subsystems are monitored and controlled. All subsystems and biomedical telemeters are processed and relayed to the communications subsystem for transmission to Alpha Control. The computers also interface with the scanners and spectrometer.

Each computer features 100 megabytes of core memory which are fully protected via hard disk and tape drive backups. A 64 bit microprocessor capable of processing over 1,000,000 commands per second is at the heart of each computer. Up to 200 separate data channels can be multiplexed for recording on the vector tape transport. Human interface is all but unnecessary due to the computers' advanced design. However, data displays and graphics may be viewed on the video screen located above the communications console on the upper deck.

In the case of a massive failure of the primary computers, the environmental control robot's computers can beloaded with elementary mission instructions to perform critical functions.

COMMUNICATIONS: High gain radio and telemetry gear utilizing the X and Z bands (frequencies classified) were designed for the Jupiter 2. There are two 10 kilowatt transmitters and two receivers capable of recovering signals with as low as 100 volt/meter strengths. One complement is located on the upper deck beneath the video monitor and the other at the lower level's auxiliary flight control.

Low-power transmitters/receivers are available in each of the following: Chariot, Space Pod, Robot, and within the helmets of the flight suits. A number of hand-held radios are provided for communication on the new planet's surface. The Chariot is also equipped with a 150 watt public address system for emergency purposes.

Besides voice transmission, over 200 data channels can be multiplexed and transmitted, providing vital information from the space- craft's telemeters to Alpha Control. Telemeters are installed to monitor biological functions, spacecraft trajectory and speed, vital circuitry, heat levels, and fuel consumption. All telemeters are monitored and multiplexed by the main computers before transmission.

Video reception is permitted on the main monitor screen. Primarily, the video monitor was designed to be used with the spacecraft's computers for data display. Television transmission was thought to be an unnecessary luxury, since all of the astronauts would be travelling in suspended animation, so no television cameras were placed on board. However, an experimental visual scanner was included for the Robinson's convenience while on the planet's surface.

ENVIRONMENTAL CONTROL SYSTEMS

ARTIFICIAL GRAVITY: A by-product of the anti-gravity drive technology permits maintenance of normal earth gravity within the spacecraft during interstellar flight. A low power (20 kilowatt) inverse Thompson gravity field projector located directly above the Thompson anti-gravity drive provides a uniform gravitational field on both decks. Control circuits are located on the center main circuitry panel on the upper deck.

CABIN PRESSURE CONTROL: Cabin pressure is maintained at Earth standard with a 79% nitrogen/21% oxygen atmosphere. Since the crew of the Jupiter 2 was placed on suspended animation on the flight, the demands on the atmospheric control subsystem were antici- pated to be light. Consequently, oxygen and carbon dioxide storage tanks are relatively compact. At normal consumption rates (out of suspended animation) the system can support a breathable atmosphere for six people for up to 60 days.

Controls for the cabin pressure seal and the oxygen bleeder valve are located on the upper level next to the tool/spacesuit storage hatch. Atmosphere circulation through the air purifier is accomplished through vents located on both upper and lower decks. The electronic air purifier is located on the lower deck in Auxiliary Control.

COMFORT CONTROL: The comfort control system maintains a 22° centigrade inside temperature. The system can cope with exterior temperatures ranging from the near absolute zero of interstellar space (-271° C.) up to 1650° C. Extreme thermal gradients caused by sun load can be withstood without the rotation of the spacecraft about its neutral axis. While usually computer controlled, there are pro- visions for manual operation. On the upper level, controls are located above the main circuitry panel next to the airlock. On the lower level, the controls are located in the Auxiliary Control complex. Heat is tapped from the heat exchanger around the hafnium carbide reactor chamber. Auxiliary quartz heaters will function when the atomic engines are not in use. Cool air is supplied from one of two available compressors. All processed air is circulated through the air purifier to the vents located on both upper and lower decks.

AIRLOCKS: Extra Vehicular Activity (EVA), if required, can be accomplished through usage of the upper deck airlock to the primary hatch. Interior atmosphere integrity is maintained while the astronaut is depressurizing or repressurizing the airlock chamber. Atmosphere in the chamber is supplied to and from the cabin pressure control system. High efficiency pumps allow pressurizing or depressurizing in only 15 seconds.

A second airlock located next to the suspended animation chambers provide access to or from the Space Pod.

STATEROOMS: Three staterooms located on the lower level 1wedesigned to be functional and yet ergonomically pleasing. These rooms were specifically designed to be as homelike as possible for the colonists on the new world, and each was decorated under the direction of the Robinsons. Each stateroom features a full closet at the rear of the room with two fold away beds on each side wall. Book shelves are available above one bed, and a fold down desk is near the entrance.

SPACESUITS: The environmentally controlled spacesuits are designed to withstand temperatures ranging from minus 150° C to plus 150° C. The outer layer of aluminized Kapton II metallic cloth is designed for micrometeoroid protection. A glass cloth layer underneath provides thermal protection, and an inner nylon layer coated with neoprene prevents ballooning under internal atmospheric pressure. The innermost layer is a Nomex lining to protect the wearer's skin from chafing. The helmet is designed to withstand 10,000 pounds per square inch and contains a built-in radio transmitter/receiver. A polyglass/metallic tether attaches to the suit and can be secured to the spacecraft for extravehicular activities, if required.

LANDING GEAR/EXTERIOR LIGHTING

The Jupiter 2 was designed for primary touchdown on three supports that protract from the outer hull. Each support is extended hydraulically and then mechanically locked in position. Ingress and egress to the vehicle is via steps on the number two support which lead to the deck-to-deck rung ladder on the lower level. Above each hydraulic support arm is a high intensity light beam for visual confirmation of the integrity of the ground supporting pads. Other exterior lights include the luminescence emanating from the Thompson field projector on the undercarriage, and the lights within the upper domed sensor array on the top of the vehicle.

The secondary or permanent landing mode was to be instituted after all testing had concluded that the new world was fit for colonization. Drilling rigs and blasting equipment were placed on board to facilitate the preparation of a foundation for the Jupiter 2. Once completed, the spacecraft would lift off, hover until all landing legs were safely stowed, and touch down within the foundation. This mode permits the use of the main hatch at ground level for ingress and egress.

LABORATORY/WORKSHOP

Located on the lower level between the auxiliary control center and the galley is a laboratory and workshop area. In the center adjoining the back wall is a laboratory bench with built-in sink and waste disposal facilities located underneath. Several key pieces of test equipment - voltmeters, ammeters, and resistance/capacitance substitution boxes are included for the repair and building of electronic equipment. Microscopes, calipers, weight scales, and other mechanical inspection instruments are stowed underneath, along with a supply of basic chemicals for chemical and biological analysis. Three algae incubation units located on the counter opposite the service corridor are included for the analysis of biological materials. Each unit contains 12 Petrie dishes for the cultures to grow in. A pressurization valve at the base of each incubation unit permits any gas or atmosphere to be introduced. Also located on the base is a spigot for drawing off liquid. A computer terminal located overhead provides access to the ship's computers for data entry and analysis.