One plan for a LUNAR BASE

Known as *Domus I*, this base design was developed by University of Wisconsin-Milwaukee department of architecture students and faculty for a NASA advanced university design program.

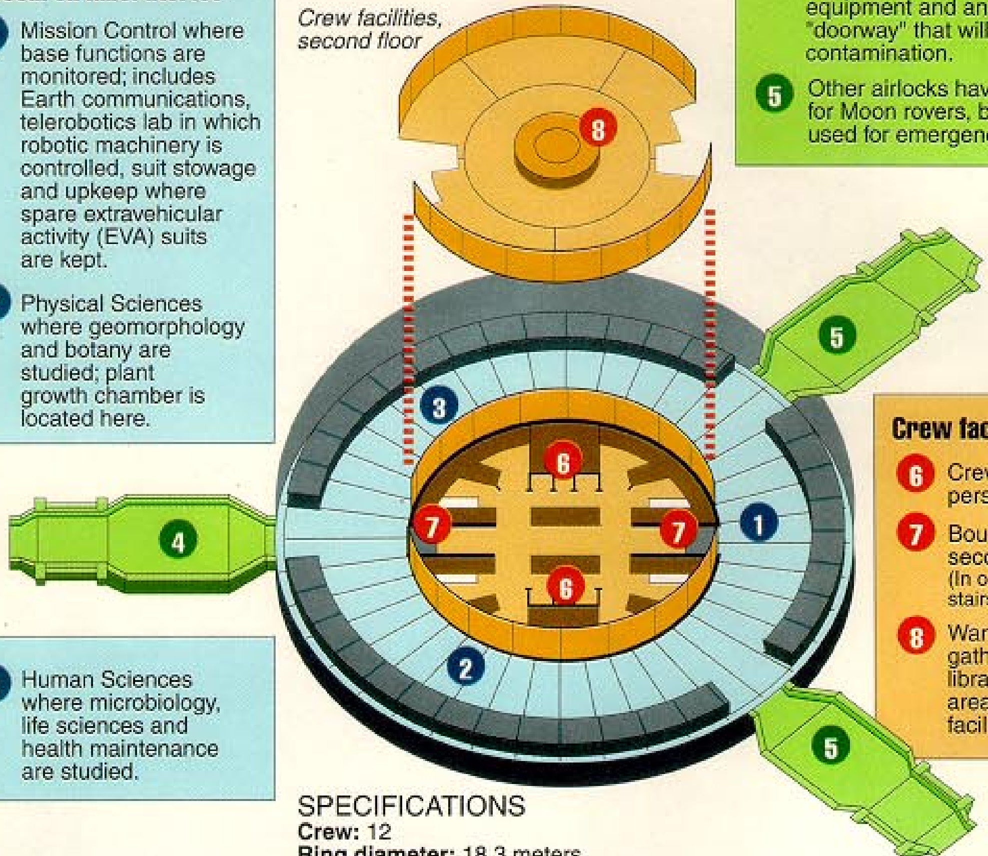
The floorplan

Research laboratories

1 Mission Control where base functions are monitored; includes Earth communications, telerobotics lab in which robotic machinery is controlled, suit stowage and upkeep where spare extravehicular activity (EVA) suits are kept.

2 Physical Sciences where geomorphology and botany are studied; plant growth chamber is located here.

3 Human Sciences where microbiology, life sciences and health maintenance are studied.



Airlocks

4 Primary airlock for human ingress/egress; contains EVA equipment and an electrostatic "doorway" that will contain Moon dust contamination.

5 Other airlocks have docking collars for Moon rovers, but can also be used for emergency ingress/egress.

Crew facilities

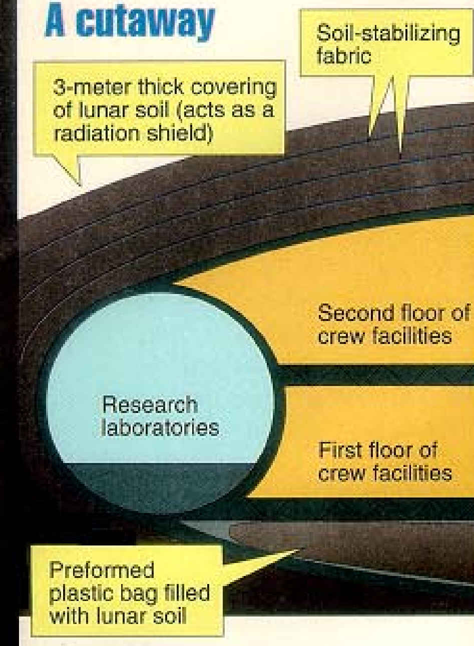
6 Crew quarters and personal hygiene area.

7 Bounding Platform to second floor. (In one-sixth Earth gravity, stairs are unnecessary.)

8 Wardroom for social gatherings, includes library, galley, recreation area and exercise facility.

SPECIFICATIONS
Crew: 12
Ring diameter: 18.3 meters
Airlocks: 3
Major limitation: Unverified construction and materials technology. Even so, NASA describes the base as "extremely feasible" and deserving of their "most serious exploration."

A cutaway



Also:

- Manufactured on Earth, the foldable lunar habitat structure can be quickly erected on the Moon. The habitat is inflated, then structural foam is injected to provide strength.
- EVA time will be needed to deliver some of the interior components, but most of the interior outfitting can be done in a shirt-sleeve environment.
- The domed crew facilities fills the ring-shaped research laboratories area. This architectural design creates a psychological separation between work and home.

Domus I as it would appear on the lunar surface, covered with radiation-shielding regolith (Moon dirt).

What do we do there?

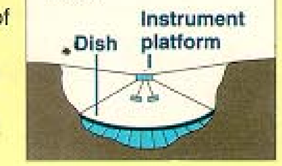
Ideas for taking advantage of the Moon

Observe Earth and the rest of the universe

Telescopes on Earth must deal with several obstacles. Among them is the refractive interference of the atmosphere, wind-induced vibration and the bending of the telescope by gravity. The moon has been proposed as a location that could eliminate or minimize all of these obstacles to reception.

A remotely operated lunar telescope could be too costly. The concept becomes more practical if the lunar telescope were part of a human-tended lunar base.

One proposal calls for placing a telescope's components in a crater.



SOURCE: NASA Goddard Space Flight Center

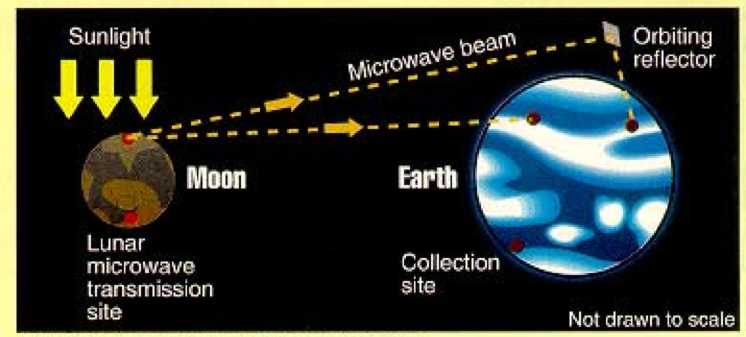
Beam solar power to Earth

As Earth's population increases, ever-increasing amounts of energy will be required to support it. An array of solar power cells on the Moon could collect solar energy which would be converted to microwaves and beamed back to Earth. This Lunar Power System (LPS) could provide inexhaustible, reliable and inexpensive power.

The solar power collector station could be built largely from materials on the Moon.

The LPS is an idea similar in concept to the Space Solar Power System (SSPS) which calls for Earth-orbiting solar collectors to beam solar power to Earth. However, the SSPS has the disadvantages of high costs of launching the many required solar-powered satellites and of detrimental environmental effects of chemical launch rockets. On the other hand, the LPS should be cheaper to build because it requires no large space platforms or major construction facilities in orbit and can be easily produced and handled on the Moon.

Realizing LPS would require an enormous investment, adding about 20 percent to the cost of a lunar base. However, about 10 years after establishing a lunar base, commercially significant amounts of power could be delivered to Earth.



SOURCE: Dr. David Criswell, University of Houston

Mine Helium-3

Nuclear energy resulting from fission yields hazardous radioactive wastes. Nuclear energy from fusion, with Helium-3 as fuel, yields much less radioactive waste and is more efficient.

However, there is a very short supply of Helium-3 on Earth. Lunar samples brought back by Apollo astronauts indicate that large quantites of Helium-3 can be found there. If the lunar soil were heated, 85 percent of the Helium-3 would be released.

It's possible that a mobile Moon mining vehicle could extract the Helium-3 as it passes over the Moon's surface. It could then be liquified and sent back to Earth for use in fusion reactors.

SOURCE: Jerry Kulcinski, University of Wisconsin-Madison

SOURCES: University of Wisconsin-Milwaukee (from a plan developed for the NASA/USRA University Advanced Design Program, based on an engineering concept by Philip Chow and T.Y. Lin)

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