XSL-01 OPERATION MANUAL

for your flight into space!

Here is your Operations Manual for the XSL-01 Manned Space Ship. Use it to learn all about the XSL-01—how to handle it and how it flies. When you become familiar with its contents, you will be a safe and reliable crew member. Your Operations Manual should be with you during all your flights. The success of the ship's many trips into outer space will depend on *YOU!*

Revell
Authentic Kits

The purpose of the XSL-01's trip to the Moon

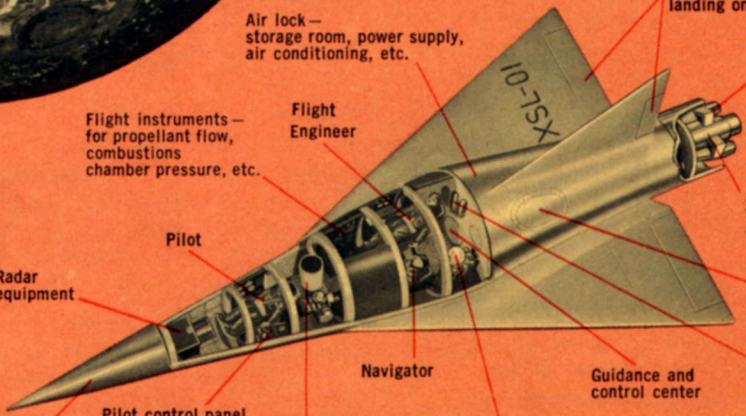
First	To explore outer space between the Earth and the Moon.
Second	To explore the Moon and return with samples and data.
Third	To observe and photograph the planets and stars; to gather further information on the nature of the Universe.
Fourth	To make a final test of man's reaction to travel in outer space away from the Earth's gravitational pull.

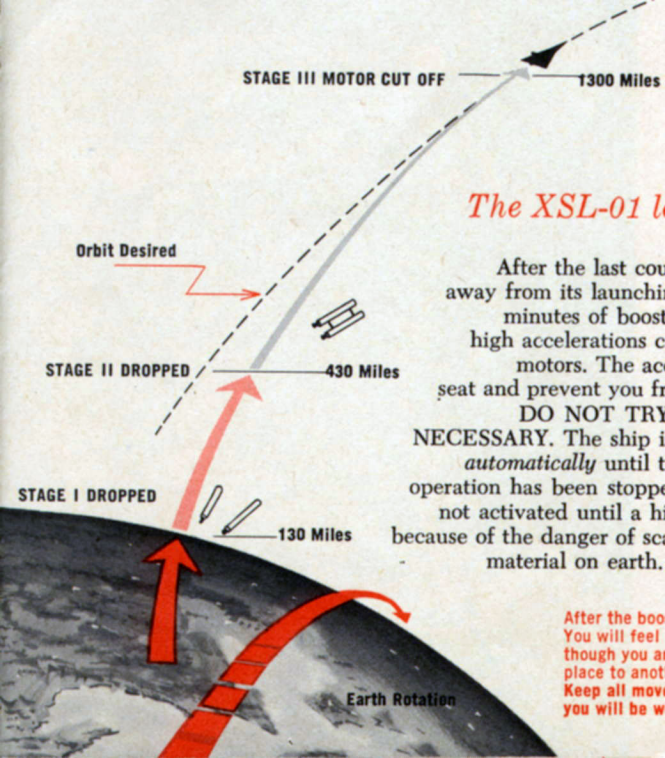
important facts about the ship:

Your XSL-01 is a three stage rocket with an overall length of 111 feet. The first and second stages are placed side by side to reduce the overall length. For Stages I and II the oxidizer is liquid fluorine and the fuel is hydrazine. For Stage III the working fluid is liquid hydrogen. Weights, speeds and altitudes of the various stages are listed below.

Stage	Gross Weight Pounds	Propellant Pounds	Speed—Miles per Hour	Thrust Pounds
I	1,366,200	732,000	4,970	1,800,000
II	269,000	475,000	12,280	500,000
III	22,600	9,600	21,600	20,000

Your Space Ship airframe will provide living and laboratory facilities for three crew members for a period of about 1 month. Below is a diagram of the placement of crew and equipment inside the ship.





The XSL-01 leaves Earth...

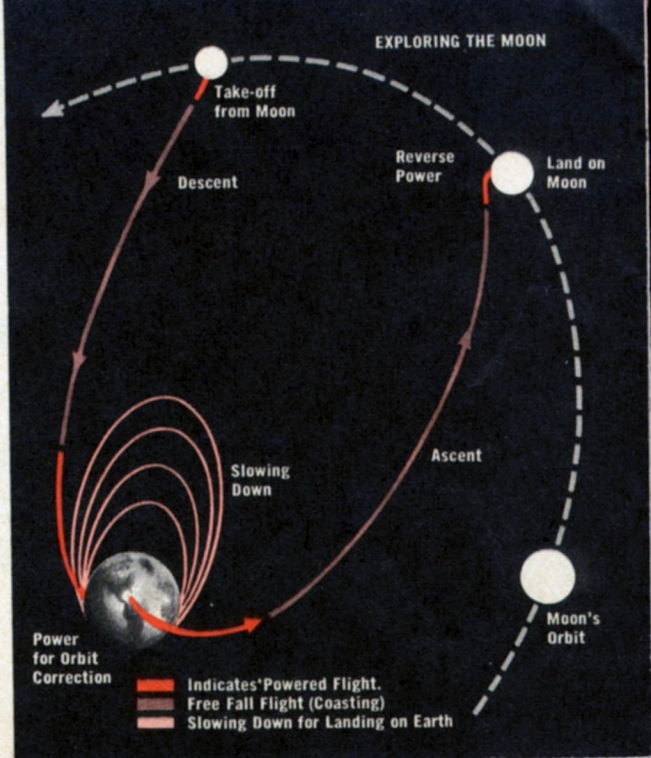
After the last count down, the XSL-01 roars away from its launching pad. During the 23 minutes of boost phase, the crew is subjected to high accelerations caused by the thrusting rocket motors. The acceleration will force you into your seat and prevent you from controlling the ship.

DO NOT TRY TO MOVE—IT IS NOT NECESSARY. The ship is designed to operate *automatically* until the third stage rocket motor operation has been stopped. The atomic rocket is not activated until a high altitude is reached because of the danger of scattering radioactive material on earth.

After the boost period the ship is in orbit. You will feel a sense of weightlessness as though you are falling. You will go from one place to another in the ship by merely floating. Keep all moveable objects fastened down—you will be weightless for at least 4½ days.

Control of the ship during boost and in outer space is done by moving the rocket motors of Stage I and II. This movement changes the direction in which the thrust acts and eliminates the need of aerodynamic control surfaces and fins. Control of third stage and landing on Moon is accomplished by the small rocket motors (monopropellant) on two opposite sides of the Atomic rocket motor and by gyroscopic wheels in the guidance unit. Landing Stage III on return will require use of wings and aerodynamic control surfaces.

WARNING—USE ROCKET MOTORS ONLY WHEN NECESSARY.



THIS IS YOUR
COUNTDOWN AND FLIGHT PROGRAM

NOTE: DO NOT deviate from original flight plan. If you are knocked out of orbit, a new orbit to the moon will be computed automatically in flight.

—10 hours	Crew briefing.
—9 hours	Load supplies in crew compartment. Preliminary check of instruments.
—8 hours	Roll space vehicle to launching site. Bring gantry tower into position.
—7½ hours	Load main element of atomic engine.
—6½ hours	Dry run on countdown to check operation of equipment.
—5 hours	Recheck weather—alert all tracking stations around the world of minus 5 hours.
—4½ hours	Make last checks on proposed flight path and plan.
—4¼ hours	Check space ship power supply, communications, electrical lines and connections to remote pre-launch controls.
—3 hours	Check supplies in crew compartment.
—2¼ hours	Alert crew members.
—2 hours	Check automatic flight programmer.
—1½ hours	Start filling liquid hydrogen tanks.
—70 minutes	Stop flow of liquid hydrogen—cap off tanks.
—1 hour (60 min.)	Start fuel loading (hydrazine, N_2H_4).
—40 minutes	Check fill level.
—39 minutes	Slow down fill rate.
—37 minutes	Stop fuel flow and cap off. Clear and wash area of possible spill.
—35 minutes	Start oxidizer loading (liquid fluorine F_2). Watch flow meter.
—15 minutes	Check fill level.
—14 minutes	Slow down flow rate.
—12 minutes	Stop oxidizer flow and cap off. Clear and wash area of possible spill.
—11 minutes	Switch on power to guidance and communication equipment.
—10 minutes	Crew enters third stage from elevator

	on gantry tower, makes series of instrument checks, and straps themselves in their seats.
—8 minutes	Remove gantry tower from launch pad.
—5 minutes	Clear area and sound warning siren.
—4 minutes	Alert communication and tracking stations. Switch to power supply aboard ship. Ship now operating on own electrical power.
—2 minutes	Sound warning siren—alert crew aboard ship.
—30 seconds	Sound warning siren.
—10 seconds	Start 4 main engines (low thrust), Stages I and II. Check operation.
—1 second	Supply full thrust.
0	**BLAST OFF!**
+85 seconds	Automatic programmer starts tilt toward calculated orbit (altitude about 30 miles).
+200 seconds	Thrust of Stage I rocket engines start decreasing to shut off.
+205 seconds	Stage I engines cut off and release boosters (altitude about 110 miles).
+206 seconds	Recovery mechanism in booster section activated and units descend.
+250 seconds	Atom pile activated in preparation for 3rd stage firing.
+345 seconds	Thrust on Stage II rocket motor is reduced.
+350 seconds	Rocket engines cut off and release Stage II boosters (altitude about 430 miles). Recovery mechanism in boosters activated.
+355 seconds	Liquid hydrogen flows into atomic rocket. Thrust of Stage III starts.
+360 seconds	Open doors of radar and solar power housing cones.
+1380 seconds (23 minutes)	Thrust of atomic rocket cut off (altitude about 1300 miles). Velocity 31,600 feet per second (6 miles per second).
+24 minutes	Space laboratory in free fall toward Moon. Crew members release themselves from seats and take over control of the ship to perform assigned duties for carrying out purpose of flight.
+4⅔ days	Ship within 24,000 miles of Moon. Atomic rocket activated for maneuver into approach for landing on Moon. Ship well within region where gravitational pull of Moon is greater than gravitational pull of Earth. Ship turned end over end to make use of rocket to slow down.

+5 days	Altitude 1900 miles above Moon.
+5⅛ days	Landing in crater Plato. Exploration of Moon conducted from here taking two Earth days.
+7½ days	Make ready for Lift-off using atomic engine.
+8 days	Enter region where Earth's gravitational pull is greater. Contact Earth bases for accurate orbit positioning.
+12 days	Ready for landing approach to Earth. Precise position, direction and speed determined. Ship aimed at outer edge of atmosphere.
+12 days 3 hours	Enter outer fringe of atmosphere and slow down a little. Beginning of braking ellipses. Minimum of two days to slow down for landing.
+14 days	Conical storage tanks jettisoned in a circular orbit around Earth.
+14 days 3 hours	Prepare for descent into denser atmosphere and airplane type landing.
+14 days 4 hours	Land at base of take-off. Mission completed.

THE XSL-01 WAS DESIGNED BY ELLWYN E. ANGLE, RESEARCH SCIENTIST IN SPACE FLIGHT

SPACE TALK GLOSSARY

XSL—Experimental space laboratory.
Orbit—The path described by an object going around another object; for example, the Earth going around the Sun.
Orbiting Velocity—Speed an object must have to orbit at a given distance from a celestial object.
Escape Velocity—Speed an object must have to exceed the Earth's gravitational pull.
Propellant—Rocket engine fuel plus oxidizer.
Oxidizer—A substance which will support combustion; for example, oxygen or fluorine.
Fuel—Any matter used to produce heat or power by combustion; for example, alcohol, gasoline, or hydrazine.
Stages I and II—Sections or boosters of a rocket which when emptied of propellant are dropped.
Thrust—The resultant "push" produced by a rocket engine.
Weightlessness—The feeling of falling; of having no weight. A state in which the effects of gravity are nullified.
Telemetering—The technique of recording or viewing distant happenings; taking instrument readings at a distance by electronic means.
Atomic pile—An arrangement of fissionable material with moderating material such as graphite, designed to make a controllable chain reaction for the production of heat which can be used to create power.
Gantry tower—Structure placed around space ship to permit access to all parts of the ship. Includes elevators to reach third stage.
Launch pad—Area from which the space ship is launched.
Flight programmer—An electronic motor driven unit which automatically directs the space ship on what to do.
Monopropellant—A single working fluid that contains both oxidizer and fuel.