A Note From Aladdin...

Aladdin Personal Programs® are produced on high quality magnetic cassette tapes using professional tape duplication methods. However, since magnetic tape oxide is not always perfectly uniform (and as such data drop-out may occur) we have included several copies of the program on each side of the tape. You will probably never experience any difficulties loading the first copy on either side, but if you do, try one of the other copies. If you cannot load *any* of the copies then you should look for hardware problems.

And Get Ready to Make Your Own Magic.

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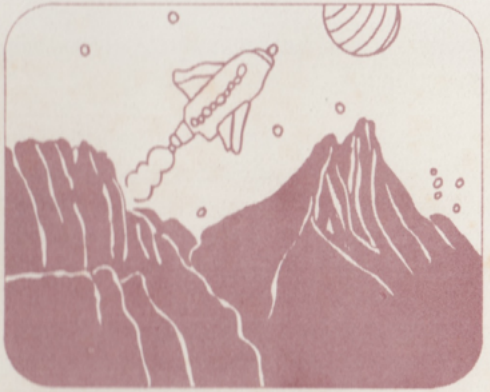

LUNAR LANDER

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by
Mike McDonald

Aladdin Automation's LUNAR LANDER is a real-time interaction simulation of the landing of an Apollo Lunar Module on the Moon's surface. It is another exciting program from the ALADDIN SIMULATION series, designed for the 8K Apple-II personal computer using Integer BASIC.

It puts you at the controls. The seconds are ticking away — your fuel level is constantly dropping towards zero. The cold, forbidding surface of the Moon beckons as gravity reaches out its tenacious tentacles and tugs you ever nearer the sheer-faced cliffs and rough terrain below.

It's up to you. Take the controls and make your first landing on the Moon a smashing (sorry, we mean thrilling) success. Can you meet the challenge?

HISTORY

Lunar landing simulations on computers have been popular ever since NASA accomplished the real thing in 1969 with Project Apollo. In fact, a simulation of the lunar landing on the giant computers at NASA was necessary long before the actual event took place. The kind of power necessary for such simulations was only available in large, expensive computers until the recent advent of minicomputers and, more recently, microcomputers. Even as computers became less expensive, real-time graphics for applications such as lander simulations were still much too expensive for the average person to have access to them.

So the popular computer games of the minicomputer era used displays that printed information about the landing craft on the screen in words and took commands from the user in the form of numbers. But with the evolution of inexpensive personal computers with relatively sophisticated graphics displays, video simulations become possible that are much more realistic (and fun) than were possible in the past.

Aladdin Automation has used this new technology to create the Apple-II LUNAR LANDER, a simulation that will give you the feeling that you are in the pilot's chair with your hands on the controls.

HOW TO LOAD LUNAR LANDER

1. Depress RESET key.
2. Depress the CTRL key, the B key, then the RETURN key.
3. Type "NEW" and depress the RETURN key.
4. Insert Aladdin's cassette (either side) into the cassette recorder.
5. Rewind the cassette.
6. Type "LOAD" on your Apple-II keyboard. Don't press the RETURN key yet!
7. Depress the PLAY button on your cassette recorder.
8. Now depress the RETURN key on your Apple-II computer keyboard.
9. Listen for the first "beep" from your computer. It will occur in about 10 seconds. It means that the program information has started entering the computer.

10. When you hear the second "beep" it means the program information has entered the computer. The system prompt ">" and the flashing cursor should now be visible on the screen.
11. Turn off your cassette recorder, rewind the cassette, and return it to its protective storage box.
12. If you should encounter a problem loading the program refer to your APPLE-II REFERENCE MANUAL — 1978, try loading again, or try loading one of the other copies contained on the cassette.

HOW TO RUN LUNAR LANDER

Once the program is loaded into the Apple-II it can be executed by typing "RUN" and pressing the RETURN key.

The program begins by clearing the screen and displaying a colorful LUNAR LANDER title block and credits information. The title block remains displayed until the SPACE BAR is pressed. Then it asks:

"SELECT CONTROL OPTION (1-2)?"

Aladdin's LUNAR LANDER may be controlled in either of two ways. Control Option 1 allows control of the LEM

with interactive response at the keyboard. Control Option 2 uses the Apple-II game paddles for control.

CONTROL OPTION 1 — Control by keyboard input.

Two types of motion are used with the LUNAR LANDER craft. Type 1 is vertical freedom affected by gravity and vertical thrust of the landing craft's two vertical thrust jets. The keys 0-9 are used to provide vertical thrust inputs, 0 being no thrust and 9 being 9 kilograms of fuel burned per second. A thrust of 4 will counteract gravity almost exactly and keep the vertical velocity of the craft stabilized.

The second type of motion is horizontal. This motion is controlled by retro rockets, one on each side of the craft. The left retro is controlled by the key labelled ">" causing acceleration to the right. The key labelled "<" controls the acceleration to the left by generating thrust from the right retro. Each key, then, is used to apply acceleration in the direction of the arrow. The keys are used *without* pressing the SHIFT key.

The critical point to remember about the keys is the way they operate. When a number key is pressed, the vertical thrusters continue to fire (applying constant acceleration)

until some other key is pressed. The response of the lunar module is very quick, because the power from the fuel is extremely high. This fuel response makes the LEM very sensitive to the controls and therefore very delicate to fly.

CONTROL OPTION 2 — Control by game paddles

With this option, the APPLE II game paddles can be substituted for the keyboard inputs to fly the LEM.

Paddle number Ø controls the vertical thruster (replacing keys Ø - 9) and paddle number 1 controls the horizontal thrusters. Paddle Ø turned completely to the left corresponds to a Ø input from the keyboard; Completely to the right corresponds to a 9 input from the keyboard. Paddle 1 turned to the left fires the right thruster (causing the craft to accelerate to the left); to the right fires the left thruster (causing the craft to accelerate to the right). Once again, the craft is extremely sensitive to the controls.

DIFFICULTY LEVELS

After selecting the control option for the flight, the program will ask:

"SELECT DEGREE OF DIFFICULTY (1-16)?"

You respond by entering a number from 1 to 16. Level 1 is the easiest version and level 16 is the most difficult. These correspond to four different starting fuel levels for each of four Moonscape blocks where the landing area can be located.

The APPLE II Lunar Lander is almost as tricky on the controls as the real Lunar Module and will require some time and practice before becoming proficient at flying and landing the craft. ALADDIN AUTOMATION feels that this type of game is more interesting than one which can be conquered easily. The 16 difficulty levels allow anyone to play and enjoy the program at a level of difficulty which is comfortable.

MOONSCAPE BLOCKS

The program creates a Moonscape which is different for each running of the program. The Moonscape is displayed in a series of 4 blocks. When the program starts Block 1 is displayed with the LEM above it.

Other blocks of the Moonscape may be displayed by using the "R" and "L" keys at anytime while the program is operating. The "R" key moves the viewing area one block to the right. Conversely, if you would like to view the block to the immediate left, use key "L". A total of four blocks of Moonscape are visible in this fashion. This feature makes the ALADDIN APPLE II LUNAR LANDER quite unique in playability and enjoyment.

The following chart shows the correlation between Moonscape BLocks, Difficulty Levels and available fuel for each option:

Difficulty Level	Landing Pad (Moonscape Block No.) Location	Starting Fuel Level (in Kilograms)
1	1	1300
2	1	1000
3	1	700
4	1	400
5	2	1400
6	2	1100
7	2	800
8	2	500
9	3	1500
10	3	1200
11	3	900
12	3	600
13	4	1600
14	4	1300
15	4	1000
16	4	700

METEOR OPTION

After selection of the appropriate level of difficulty for the flight the program will ask:

"METEOR OPTION (Ø-1)?"

This option allows you to turn off the meteor shower that accompanies the program by typing Ø. Entering a 1 at this point tells the program to bring on the meteors.

Combining two meteor options, sixteen difficulty levels and two control options yields 64 different ways to play the game and the program generates a totally different Moonscape each time!! A delightful variety which will provide many hours of enjoyment for your entire family.

LUNAR MODULE INSTRUMENT PANEL

After the three options have been selected the program will clear the screeen ad display a white bar at the left of the screen. This is the first position of the Moonscape and tells you that the program is operating properly during the short pause it takes to set up the Moonscape.

The program will also display the Lunar Module Instrument Panel across the bottom of the screen. The Instrument Panel titles are as follows:

ALT H-VEL V-VEL FUEL TIME

The values displayed under each heading indicate the LEM's vital readings in real-time for the altitude of the craft (ALT), the horizontal velocity (H-VEL), the vertical velocity (V-VEL), remaining fuel (FUEL) and elapsed mission time (TIME).

ALT

The computer will constantly display the craft's altitude on this indicator. The altitude of the display screen is 3600 meters. *This is the maximum viewable area.* However, the craft may fly as high as 10,000 meters. Above 4,000 meters, the craft will be lost from sight on the display but the instruments still function correctly and the flashing message "***LOST IN SPACE***" will be seen in the message area of the display.

H-VEL

This indicator shows the horizontal velocity in meters per second. If the H-VEL display indicates a negative velocity, the craft is moving toward the left at that speed. If the number is positive the craft is moving toward the right.

Should the craft move off the display to the left, the message "***LOST TO THE LEFT***" will flash in the message area. When the craft is off the display to the right, the message "***LOST TO THE RIGHT***" will flash in the message area.

V-VEL

The vertical velocity is shown under the heading V-VEL. When the number is negative the craft is falling, when positive it is rising.

FUEL

The fuel level indicator shows remaining fuel in kilograms. When you start the landing sequence, the amount of fuel depends upon your level of difficulty selection. When your fuel level shows 0, you have no remaining fuel to burn and your craft drops to the surface under the pull of gravity.

TIME

This indicator shows your elapsed mission time in seconds. One of the objectives of the mission is to

achieve a landing within the shortest possible time using the least amount of fuel. You can strive for shorter, and shorter missions as a way of demonstrating more capability in your handling of the Lunar Module.

ENDING THE MISSION — LANDING THE LUNAR MODULE

The landing area has been marked with colored dye by a robot probe on a previous mission. The probe was also responsible for carving from the Moonscape an area large enough to safely bring down the Lunar Module. The LEM must be landed at a speed of less than 10 meters per second.

If the landing velocity of the craft is greater than 25 meters per second, your landing will terminate in an explosion. Between 10 and 25 meters per second landing velocity your craft will suffer damage. You may survive the landing but will be unable to get home again. A perfect landing results when the craft has Ø velocity. A successful landing results in the message

"***THE EAGLE HAS LANDED***"

and a musical reward. After the flight has reached its

termination the question

"***WOULD YOU LIKE TO TRY AGAIN (Y-N)?***"

is displayed. A "Y" response sends the program back to the beginning, where you select the options for the next flight in the LEM. An "N" response ends the program.

STRATEGY

Some thinking and planning is involved in making a successful landing in the LEM. Since the controls of the craft are very sensitive, very small control adjustments are advised. Radical control adjustments usually result in the landing craft going out of control and crashing before recovery can be made.

Changing only one thruster control at a time is usually advisable, since it is much harder to keep track of changes to both simultaneously.

Another helpful strategy (when playing difficulty levels above 4) is to put the lander into a stable parking orbit and use the "R" key to look at sections of moonscape where you will be flying. This tactic takes some time but allows you to avoid surprise peaks in the moonscape.

We are sure you will discover other helpful strategies in this stimulating computer game. Each flight is different to keep you from getting bored.

Avoiding encounters with meteors requires maneuvering the craft immediately upon sighting the meteor and judging it to be a danger to the craft.

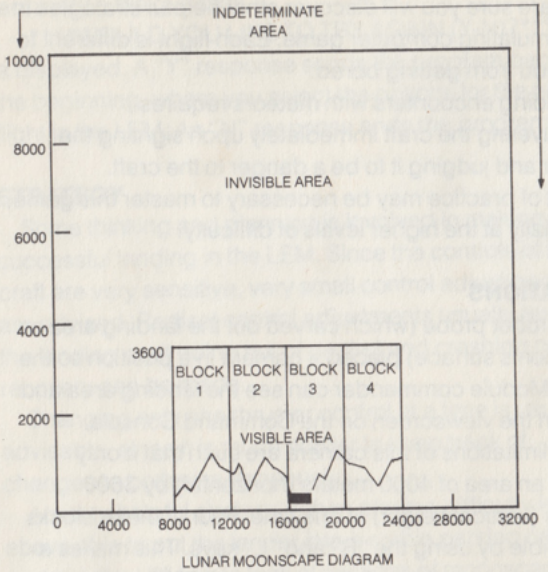
A lot of practice may be necessary to master this game, especially at the higher levels of difficulty.

LIMITATIONS

The robot probe (which carved out the landing area on the Moon's surface) placed a camera in a position so the Lunar Module commander can see the landing area and LEM on the viewscreen on the Command Console.

The limitations of this camera are such that it only shows an area of 4000 meters (horizontal) by 3600 meters (vertical height) at one time. Four of these blocks are visible by using the "R" and "L" keys. This makes a total visible area through the camera of 3600 meters by 16,000 meters (4000 meters at one time).

This visible area is contained within an area 10,000 meters by 32,000 meters within which the Lunar Module may safely fly, as shown in this figure:



LUNAR MOONSCAPE DIAGRAM

If you fly outside of the allowable area, the effects are indeterminate and may result in irregular termination of the program.