1
00:00:01,860 --> 00:00:06,690
[John F. Kennedy] I believe that this nation
should commit itself to achieving the goal,

2
00:00:06,690 --> 00:00:12,009
before this decade is out, of landing a man
on the Moon and returning him safely to the

3
00:00:12,009 --> 00:00:13,829
Earth.

4
00:00:14,340 --> 00:00:19,700
[Neil Armstrong] Soon after President Kennedy's
call to go to the Moon in 1961, a number of

5
00:00:19,700 --> 00:00:26,140
researchers began to think about the various
aspects of a lunar flight.

6
00:00:26,140 --> 00:00:34,000
NASA's Flight Research Center, at Edwards, proposed
a free flight lunar landing simulator program.

7
00:00:34,000 --> 00:00:39,400
The research test vehicle was intended to
investigate the inherent problems of lunar

8
00:00:39,410 --> 00:00:44,980
descents, where there is no drag, and weight
is only one-sixth of Earth.

9
00:00:46,180 --> 00:00:52,440
The proposed technique for simulating the
Lunar gravity: install a jet engine underneath

10
00:00:52,450 --> 00:00:59,450
or within the machine, on gimbals, so the
thrust was always vertically upward.

11

00:01:00,320 --> 00:01:05,960
Engine thrust would then be adjusted so that
the craft's net weight- that is, its gross

12
00:01:05,970 --> 00:01:10,500
weight minus the engine thrust, would equal
its lunar equivalent.

13
00:01:10,500 --> 00:01:16,820
The force required to lift the net weight
would be provided by throttle-able rockets.

14
00:01:16,820 --> 00:01:23,380
The first flight of the LLRV in October of
'64 was flown by Joe Walker.

15
00:01:23,380 --> 00:01:29,260
First liftoff was what you might call tentative.

16
00:01:29,260 --> 00:01:34,020
The second was considerably smoother. During
the following year Joe Walker and Don Mallick

17
00:01:34,020 --> 00:01:39,439
flew about 150 development flights, expanding
the flight envelope and investigating the

18
00:01:39,439 --> 00:01:43,119
adequacy of the design and the systems.

19
00:01:43,119 --> 00:01:49,400
An advanced version of the LLRV, the lunar
landing training vehicle or LLTV, proved to

20
00:01:49,400 --> 00:01:55,670
be an excellent simulator and was highly regarded
by the Apollo lunar module crews as necessary

21
00:01:55,670 --> 00:01:58,130
for lunar landing preparation.

22
00:01:59,260 --> 00:02:04,640
Typically, the pilot took off with the gimbals
locked, flew out to the inner marker, which

23
00:02:04,650 --> 00:02:09,110
in this case was about four to five-hundred
feet altitude, about a quarter of a mile

24
00:02:09,110 --> 00:02:12,670
from the intended touchdown spot.

25
00:02:12,670 --> 00:02:20,100
Arriving at the IP, he began a descent toward
the target, switched into the lunar simulation

26
00:02:20,100 --> 00:02:26,700
mode, energized the lift rockets, and practiced
the lunar landing.

27
00:02:27,660 --> 00:02:33,280
I was most fortunate to be involved throughout
the entire lunar flying development. I had

28
00:02:33,290 --> 00:02:38,650
the pleasure of flying every one of the machines:
the LLRF, the ground based simulators, the

29
00:02:38,650 --> 00:02:45,650
LLRV, the LLTV, the lunar module, and even
the Weber ejection seat, the last not by choice.

30
00:02:45,819 --> 00:02:50,459
NASA management was forever worried about
he reliability and safety of these machines

31
00:02:50,459 --> 00:02:53,639
and continually wanted to shut them down.

32

00:02:53,640 --> 00:03:01,440
But the pilots insisted they were vital to
lunar landing preparation and they prevailed.

33
00:03:01,940 --> 00:03:06,660
...drifting to the right a little...

34
00:03:09,380 --> 00:03:11,760
...contact light...ok, engine stop...

35
00:03:11,760 --> 00:03:14,500
...we copy you down, Eagle...

36
00:03:15,520 --> 00:03:18,120
...Tranquility Base here, the Eagle has landed.

37
00:03:18,440 --> 00:03:23,380
[Music]

38
00:03:23,380 --> 00:03:29,220
[Charlie Bolden] Thank you Neil, Buzz, and
Mike. We're standing on your shoulders, building

39
00:03:29,230 --> 00:03:34,730
on your historic achievements. That drive to
reach higher is alive and well in today's