



EPISODE ONE
GETTING OFF THE GROUND

1
00:00:16,790 --> 00:00:14,709
the blue marble

2
00:00:17,670 --> 00:00:16,800
that was our first

3
00:00:19,269 --> 00:00:17,680
view

4
00:00:21,510 --> 00:00:19,279
of ourselves

5
00:00:22,790 --> 00:00:21,520
we really are the blue planet we're

6
00:00:28,550 --> 00:00:22,800
hanging out here in the middle of

7
00:00:35,030 --> 00:00:32,229
in fact apollo imagery was part of the

8
00:00:36,229 --> 00:00:35,040
justification for putting together a

9
00:00:38,630 --> 00:00:36,239
satellite

10
00:00:41,430 --> 00:00:38,640
that would look at the earth

11
00:00:43,750 --> 00:00:41,440
that satellite was the first landsat

12
00:00:45,670 --> 00:00:43,760
the landsat mission now holds the title

13
00:00:50,790 --> 00:00:45,680

for the longest continuous space-based

14

00:00:55,990 --> 00:00:52,790

at least one landsat satellite has been

15

00:00:59,430 --> 00:00:56,000

orbiting the earth since 1972 that's

16

00:01:01,029 --> 00:00:59,440

nearly 50 years of steadfast observation

17

00:01:03,189 --> 00:01:01,039

the program was born in the midst of

18

00:01:06,950 --> 00:01:03,199

several historical flashpoints during a

19

00:01:08,950 --> 00:01:06,960

time when the world was changing quickly

20

00:01:11,190 --> 00:01:08,960

well it really was a perfect storm we

21

00:01:12,550 --> 00:01:11,200

had a lot of technology coming out of

22

00:01:14,870 --> 00:01:12,560

world war ii

23

00:01:16,070 --> 00:01:14,880

with air flown sensors

24

00:01:18,230 --> 00:01:16,080

we also

25

00:01:21,190 --> 00:01:18,240

had an awareness of the environment

26
00:01:23,670 --> 00:01:21,200
between rachel carson even stuart udall

27
00:01:27,270 --> 00:01:23,680
wrote a book called the quiet crisis

28
00:01:29,429 --> 00:01:27,280
those two things together the space race

29
00:01:31,270 --> 00:01:29,439
all of those came together

30
00:01:33,590 --> 00:01:31,280
but the landsat story doesn't actually

31
00:01:35,990 --> 00:01:33,600
start with nasa it starts with the

32
00:01:38,469 --> 00:01:36,000
united states geological survey

33
00:01:41,830 --> 00:01:38,479
there were a couple of really

34
00:01:43,670 --> 00:01:41,840
interesting players the primary one is

35
00:01:45,749 --> 00:01:43,680
william t pecora

36
00:01:47,510 --> 00:01:45,759
and he was director of the u.s

37
00:01:50,550 --> 00:01:47,520
geological survey

38
00:01:52,550 --> 00:01:50,560

his boss was stuart udall he tried

39

00:01:56,630 --> 00:01:52,560

floating it around and it didn't quite

40

00:01:57,749 --> 00:01:56,640

make it department of defense the cia

41

00:01:59,830 --> 00:01:57,759

nasa

42

00:02:01,990 --> 00:01:59,840

which was just beginning at that point

43

00:02:03,429 --> 00:02:02,000

they all said nan you know this isn't

44

00:02:07,510 --> 00:02:03,439

the right time

45

00:02:10,070 --> 00:02:07,520

so in 1966 pakora and udall announced

46

00:02:11,350 --> 00:02:10,080

that okay fine department of interior

47

00:02:14,949 --> 00:02:11,360

will launch

48

00:02:17,110 --> 00:02:14,959

and so that caused a big kerfuffle and

49

00:02:19,270 --> 00:02:17,120

and the bottom line was that nasa was

50

00:02:21,830 --> 00:02:19,280

forced to step up and say yeah okay

51
00:02:23,510 --> 00:02:21,840
we'll do it but let's pause for a second

52
00:02:25,589 --> 00:02:23,520
obviously there was a big push to make

53
00:02:27,910 --> 00:02:25,599
an earth observing satellite but what

54
00:02:30,309 --> 00:02:27,920
exactly did it need to do

55
00:02:32,550 --> 00:02:30,319
landsat's entire job is to collect light

56
00:02:33,830 --> 00:02:32,560
visible light like this and non-visible

57
00:02:35,990 --> 00:02:33,840
light like this

58
00:02:38,309 --> 00:02:36,000
after landsat captures the light it sees

59
00:02:41,270 --> 00:02:38,319
it can make two kinds of pictures true

60
00:02:43,030 --> 00:02:41,280
color images and false color images

61
00:02:45,270 --> 00:02:43,040
did you know your eyes can only detect

62
00:02:47,110 --> 00:02:45,280
red green and blue it sounds crazy but

63
00:02:48,630 --> 00:02:47,120

it's true in fact if you took a

64

00:02:50,470 --> 00:02:48,640

magnifying glass to the screen you're

65

00:02:52,869 --> 00:02:50,480

probably looking at right now you'd see

66

00:02:54,229 --> 00:02:52,879

a jumble of red green and blue dots mix

67

00:02:56,309 --> 00:02:54,239

those colors together with different

68

00:02:58,550 --> 00:02:56,319

intensities and your brain interprets

69

00:03:00,790 --> 00:02:58,560

all the colors of the rainbow true color

70

00:03:02,869 --> 00:03:00,800

images are made by combining red blue

71

00:03:05,509 --> 00:03:02,879

and green light but what's even more

72

00:03:07,910 --> 00:03:05,519

amazing landsat also captures infrared

73

00:03:09,990 --> 00:03:07,920

light beyond what we can see and that

74

00:03:12,070 --> 00:03:10,000

light can reveal some incredible things

75

00:03:13,430 --> 00:03:12,080

when you look at a false color image

76

00:03:15,430 --> 00:03:13,440

like the difference between types of

77

00:03:17,270 --> 00:03:15,440

plants how healthy those plants are

78

00:03:19,830 --> 00:03:17,280

healthy coral reefs and even dead coral

79

00:03:22,550 --> 00:03:19,840

reefs fire tracking ocean pollution the

80

00:03:23,990 --> 00:03:22,560

possibilities are nearly endless

81

00:03:25,830 --> 00:03:24,000

in fact i bet you've probably seen

82

00:03:27,910 --> 00:03:25,840

landsat's influence on pop culture

83

00:03:30,070 --> 00:03:27,920

without even knowing it from google

84

00:03:31,110 --> 00:03:30,080

earth and works of art to television and

85

00:03:32,390 --> 00:03:31,120

movies

86

00:03:34,550 --> 00:03:32,400

and i should know

87

00:03:37,030 --> 00:03:34,560

before my untimely smushing by an 85

88

00:03:39,589 --> 00:03:37,040

foot tall great ape deep into the film i

89

00:03:42,869 --> 00:03:39,599

your narrator played landsat steve in

90

00:03:44,470 --> 00:03:42,879

kong skull island but i digress now back

91

00:03:46,949 --> 00:03:44,480

to our story

92

00:03:48,710 --> 00:03:46,959

nasa and usgs get to work largely under

93

00:03:51,030 --> 00:03:48,720

the direction of lead engineer virginia

94

00:03:53,030 --> 00:03:51,040

norwood who was often called the mother

95

00:03:54,710 --> 00:03:53,040

of landsat

96

00:03:56,229 --> 00:03:54,720

norwood and her team had to design an

97

00:03:58,229 --> 00:03:56,239

experimental instrument the

98

00:04:01,350 --> 00:03:58,239

multi-spectral scanner that had never

99

00:04:04,070 --> 00:04:01,360

been flown in space before we took a

100

00:04:06,630 --> 00:04:04,080

and nasa took a real gamble to

101
00:04:08,630 --> 00:04:06,640
propose a scanner for this that with

102
00:04:10,390 --> 00:04:08,640
quite a bit of skepticism

103
00:04:12,229 --> 00:04:10,400
to assuage the skeptics and test the

104
00:04:14,070 --> 00:04:12,239
scanner's capabilities the team loaded

105
00:04:17,110 --> 00:04:14,080
up the test model on a truck and headed

106
00:04:19,189 --> 00:04:17,120
to yosemite and this was because

107
00:04:20,949 --> 00:04:19,199
nobody believes that scanner will work i

108
00:04:26,070 --> 00:04:20,959
think you better

109
00:04:31,350 --> 00:04:27,909
the true test came when landsat 1

110
00:04:33,590 --> 00:04:31,360
launched on july 23rd 1972

111
00:04:35,909 --> 00:04:33,600
sadly william t pecora one of the

112
00:04:38,070 --> 00:04:35,919
project's original champions died just

113
00:04:39,110 --> 00:04:38,080

three days before landsat took its place

114

00:04:41,189 --> 00:04:39,120

in orbit

115

00:04:43,590 --> 00:04:41,199

but with this launch the united states

116

00:04:45,909 --> 00:04:43,600

and soon the world would step into a new

117

00:04:47,590 --> 00:04:45,919

paradigm of earth observation

118

00:04:49,510 --> 00:04:47,600

never before seen snapshot of land

119

00:04:52,070 --> 00:04:49,520

resources in the environment would be

120

00:04:56,870 --> 00:04:52,080

key for critical decision making decades

121

00:05:02,710 --> 00:05:00,150

it's impossible to predict really the

122

00:05:04,230 --> 00:05:02,720

exact lifetime of one of these birds

123

00:05:06,230 --> 00:05:04,240

but we hope that the

124

00:05:08,550 --> 00:05:06,240

spacecraft can go on perhaps for another