1
00:00:21,419 --> 00:00:06,090
every space film should begin with a

2
00:00:25,769 --> 00:00:21,429
launch because that's how space began on

3
00:00:27,450 --> 00:00:25,779
the 16th of March 1976 NASA celebrated

4
00:00:29,669 --> 00:00:27,460
the 50th anniversary of the first

5
00:00:33,090 --> 00:00:29,679
successful liquid-fueled rocket flight

6
00:00:44,160 --> 00:00:33,100
by doctor Robert Goddard it was a joyful

7
00:00:48,990 --> 00:00:46,410
we at goddard will penetrate even

8
00:00:51,420 --> 00:00:49,000
further into the distances and mysteries

9
00:00:53,819 --> 00:00:51,430
of the universe and of earth what as

10
00:00:57,510 --> 00:00:53,829
usual without most of us ever leaving

11
00:00:59,729 --> 00:00:57,520
our offices and laboratories Goddard

12
00:01:02,040 --> 00:00:59,739
Space Flight Center is a kaleidoscope of

13
00:01:03,960 --> 00:01:02,050

extremes ranging all the way from the

14
00:01:07,740 --> 00:01:03,970
University campus to an industrial

15
00:01:10,399 --> 00:01:07,750
complex it's a partnership of physicists

16
00:01:13,710 --> 00:01:10,409
astronomers mathematicians engineers

17
00:01:15,950 --> 00:01:13,720
managers and experts in almost any high

18
00:01:21,859 --> 00:01:15,960
technology or craft you can think of

19
00:01:27,270 --> 00:01:24,359
around the clock whatever the weather

20
00:01:29,279 --> 00:01:27,280
these buildings fill with the quiet far

21
00:01:32,249 --> 00:01:29,289
thinking men and women who are producing

22
00:01:34,380 --> 00:01:32,259
the ideas systems and hardware which is

23
00:01:37,050 --> 00:01:34,390
gradually changing our world and

24
00:01:39,960 --> 00:01:37,060
improving the overall quality of life on

25
00:01:42,570 --> 00:01:39,970
earth the Goddard mission begins with

26
00:01:45,560 --> 00:01:42,580
very human current pressing needs of two

27
00:01:47,940 --> 00:01:45,570
types the first is the need for

28
00:01:50,940 --> 00:01:47,950
fundamental knowledge the knowledge that

29
00:01:54,749 --> 00:01:50,950
comes from basic scientific enquiry we

30
00:01:58,109 --> 00:01:54,759
in the space sciences look from planet

31
00:02:01,230 --> 00:01:58,119
Earth to our solar system to the far

32
00:02:04,350 --> 00:02:01,240
reaches of the universe instruments on

33
00:02:07,530 --> 00:02:04,360
spacecraft are the extension of our

34
00:02:11,550 --> 00:02:07,540
senses ranging from radio waves the

35
00:02:13,830 --> 00:02:11,560
gamma rays our aim is to understand the

36
00:02:16,770 --> 00:02:13,840
forces of nature that shape man's

37
00:02:19,229 --> 00:02:16,780
environment in this enormous task each

38
00:02:21,660 --> 00:02:19,239

investigator takes a small part of the

39
00:02:24,300 --> 00:02:21,670
responsibility within his scientific

40
00:02:26,430 --> 00:02:24,310
discipline the second basic need which

41
00:02:28,759 --> 00:02:26,440
Goddard serves is the need for just

42
00:02:32,490 --> 00:02:28,769
plain everyday help what we call

43
00:02:35,340 --> 00:02:32,500
applications when will it be the best to

44
00:02:38,069 --> 00:02:35,350
plant is there a threat of a flood what

45
00:02:40,319 --> 00:02:38,079
is the sea state east of Borneo is an

46
00:02:42,900 --> 00:02:40,329
earthquake coming can I get a call

47
00:02:45,509 --> 00:02:42,910
through to Tokyo now will the Olympics

48
00:02:48,569 --> 00:02:45,519
be telecast have they found the missing

49
00:02:50,700 --> 00:02:48,579
plane at the edge of Goddard's main site

50
00:02:52,620 --> 00:02:50,710
there is a fully operational tracking

51
00:02:56,180 --> 00:02:52,630
station which is part of the worldwide

52
00:02:58,470 --> 00:02:56,190
network and also serves for training

53
00:03:01,200 --> 00:02:58,480
tracking sites are positioned in

54
00:03:03,990 --> 00:03:01,210
Australia Europe South America Hawaii

55
00:03:06,360 --> 00:03:04,000
and Alaska to obtain complete coverage

56
00:03:08,820 --> 00:03:06,370
especially of low orbit satellites like

57
00:03:13,770 --> 00:03:08,830
Landsat and those used in manned

58
00:03:15,780 --> 00:03:13,780
missions Goddard also uses specially

59
00:03:18,120 --> 00:03:15,790
instrumented aircraft and ships to

60
00:03:20,310 --> 00:03:18,130
support split-second decisions over

61
00:03:22,590 --> 00:03:20,320
remote areas during the critical earth

62
00:03:25,770 --> 00:03:22,600
orbit and re-entry phases of manned

63
00:03:27,810 --> 00:03:25,780

flight but the most fascinating new

64
00:03:30,720 --> 00:03:27,820
development is the use of lasers in

65
00:03:32,940 --> 00:03:30,730
tracking Skylab astronauts describe them

66
00:03:35,340 --> 00:03:32,950
as the brightest spots on earth and

67
00:03:37,860 --> 00:03:35,350
their accuracy is so great that

68
00:03:40,320 --> 00:03:37,870
satellites can detect a landmass shift

69
00:03:44,310 --> 00:03:40,330
of only inches spanning new york in

70
00:03:46,950 --> 00:03:44,320
california here in Goddard's network

71
00:03:49,290 --> 00:03:46,960
operations control center the commands

72
00:03:52,740 --> 00:03:49,300
and predictions flow out and the data

73
00:03:54,720 --> 00:03:52,750
streams and from this room they manage

74
00:03:57,030 --> 00:03:54,730
the daily workload of up to 50

75
00:03:58,830 --> 00:03:57,040
satellites working in six nearly

76
00:04:01,110 --> 00:03:58,840
independent disciplines

77
00:04:05,580 --> 00:04:01,120
three and science and three and

78
00:04:07,790 --> 00:04:05,590
applications on that day in 1969 when we

79
00:04:11,070 --> 00:04:07,800
first landed on the moon

80
00:04:14,280 --> 00:04:11,080
132 science and application satellites

81
00:04:17,640 --> 00:04:14,290
had already been put to work today the

82
00:04:19,560 --> 00:04:17,650
number exceeds 200 if you're surprised

83
00:04:22,110 --> 00:04:19,570
at the number of spacecraft which have

84
00:04:24,600 --> 00:04:22,120
been put to work by Goddard alone you

85
00:04:27,540 --> 00:04:24,610
may be even more impressed if you think

86
00:04:32,430 --> 00:04:27,550
of what it takes to design build test

87
00:04:35,760 --> 00:04:32,440
and fly each single one every component

88
00:04:37,800 --> 00:04:35,770

power supplies attitude controls sensors

89
00:04:43,760 --> 00:04:37,810
and electronics all must survive the

90
00:04:48,030 --> 00:04:46,440
and the punishing vibration tests

91
00:04:49,590 --> 00:04:48,040
simulating the violence of heavy

92
00:04:52,650 --> 00:04:49,600
acceleration up through the Earth's

93
00:04:55,230 --> 00:04:52,660
ocean of air to the massive anechoic

94
00:04:58,410 --> 00:04:55,240
chambers and vacuum chambers simulating

95
00:05:01,020 --> 00:04:58,420
the environment of outer space the

96
00:05:03,510 --> 00:05:01,030
project team the scientists engineers

97
00:05:06,150 --> 00:05:03,520
and managers must see that everything

98
00:05:08,760 --> 00:05:06,160
comes together on the launch pad on time

99
00:05:12,930 --> 00:05:08,770
and with total reliability one day

100
00:05:15,390 --> 00:05:12,940
several years in the future the program

101
00:05:17,910 --> 00:05:15,400
may also have to survive frequent design

102
00:05:21,420 --> 00:05:17,920
upgrading as the multiple states of the

103
00:05:23,580 --> 00:05:21,430
art advanced piece by piece it all comes

104
00:05:26,190 --> 00:05:23,590
together in the surgical cleanliness of

105
00:05:28,830 --> 00:05:26,200
integration and final assembly where

106
00:05:42,090 --> 00:05:28,840
again they must prove that they all work

107
00:05:47,740 --> 00:05:44,800
the moment of launch is thrilling and

108
00:05:49,420 --> 00:05:47,750
important but the great moment for those

109
00:05:54,100 --> 00:05:49,430
who have worked so long and so well

110
00:05:56,620 --> 00:05:54,110
comes after a successful orbit when the

111
00:05:59,159 --> 00:05:56,630
first commands are given when the first

112
00:06:02,680 --> 00:05:59,169
cataract of data starts toward Earth

113
00:06:06,750 --> 00:06:02,690

when it is successfully reduced analyzed

114
00:06:12,670 --> 00:06:06,760
and passed to the experimenters then

115
00:06:14,920 --> 00:06:12,680
only then all prayers are answered the

116
00:06:18,040 --> 00:06:14,930
more than 100 tons of instruments

117
00:06:20,140 --> 00:06:18,050
sensors cameras relays and telescopes

118
00:06:22,180 --> 00:06:20,150
which have been sent spinning so

119
00:06:24,580 --> 00:06:22,190
effortlessly about our earth have

120
00:06:27,430 --> 00:06:24,590
touched us all you can measure it

121
00:06:29,290 --> 00:06:27,440
long-distance calls are cheaper the

122
00:06:31,659 --> 00:06:29,300
savings from increased accuracy and

123
00:06:34,600 --> 00:06:31,669
range in weather prediction is computed

124
00:06:37,420 --> 00:06:34,610
in billions the cash benefits daily to

125
00:06:39,610 --> 00:06:37,430
shipping farming forestry prospecting

126
00:06:42,460 --> 00:06:39,620
control of pollution are readily

127
00:06:44,590 --> 00:06:42,470
acknowledged by those in the field from

128
00:06:47,920 --> 00:06:44,600
basic science even more dramatic

129
00:06:49,600 --> 00:06:47,930
applications will flow discoveries which

130
00:06:52,450 --> 00:06:49,610
will help us protect our near space

131
00:06:54,820 --> 00:06:52,460
environment increase our understanding

132
00:06:56,980 --> 00:06:54,830
of the mechanics of earthquakes teach us

133
00:07:00,190 --> 00:06:56,990
how to relate the activities on our Sun

134
00:07:01,990 --> 00:07:00,200
to events here on earth the next

135
00:07:04,510 --> 00:07:02,000
generation of effort will be based on

136
00:07:07,180 --> 00:07:04,520
multi mission spacecraft carried onboard

137
00:07:10,120 --> 00:07:07,190
the space shuttle of the ATS making

138
00:07:13,659 --> 00:07:10,130

space research ever more accessible more

139
00:07:15,730 --> 00:07:13,669
routine and more cost-effective it is

140
00:07:20,170 --> 00:07:15,740
everything the doctor Godard predicted

141
00:07:22,900 --> 00:07:20,180
and more how happy he would have been to

142
00:07:25,870 --> 00:07:22,910
join the six others riding that rocket

143
00:07:35,640 --> 00:07:25,880
into space with its vital payload of

144
00:07:45,420 --> 00:07:41,670
I have here copy of a letter written in

145
00:07:49,740 --> 00:07:45,430
1932 by dr. Goddard to the famous

146
00:07:52,379 --> 00:07:49,750
historian the futurist HG Wells let me

147
00:07:55,529 --> 00:07:52,389
read just one paragraph for you to me

148
00:07:57,540 --> 00:07:55,539
this one paragraph says it all how many

149
00:08:01,650 --> 00:07:57,550
years I shall be able to work on the

150
00:08:04,260 --> 00:08:01,660
problem I do not know I hope as long as

151
00:08:07,260 --> 00:08:04,270
I live there can be no thought of

152
00:08:10,110 --> 00:08:07,270
finishing for aiming at the Stars both

153
00:08:14,219 --> 00:08:10,120
literally and figuratively is a problem

154
00:08:16,830 --> 00:08:14,229
to occupy generations so that no matter