1
00:00:29,460 --> 00:00:26,609
these people are here in Mission Control

2
00:00:32,519 --> 00:00:29,470
were responsible for guiding NASA's

3
00:00:35,729 --> 00:00:32,529
eighteen hundred pound on land Voyager 1

4
00:00:40,170 --> 00:00:35,739
spacecraft some billion miles through

5
00:00:42,900 --> 00:00:40,180
space on November twelfth after a

6
00:00:44,910 --> 00:00:42,910
three-year journey Voyager 1 made its

7
00:00:47,850 --> 00:00:44,920
closest to compromise with the planet

8
00:00:50,630 --> 00:00:47,860
Saturn now Plus sequencer receiver plus

9
00:00:53,759 --> 00:00:50,640
proof Voyager has returned more than

10
00:00:55,979 --> 00:00:53,769
18,000 photographs photographs that are

11
00:00:58,740 --> 00:00:55,989
giving scientists excellent close-up

12
00:01:03,780 --> 00:00:58,750
views and new information about the huge

13
00:01:05,880 --> 00:01:03,790

planet and its many moons with the help

14
00:01:08,700 --> 00:01:05,890
of computer animation you can take a

15
00:01:14,940 --> 00:01:08,710
ride on Voyager to Saturn and its major

16
00:01:16,950 --> 00:01:14,950
moons voyagers 11 scientific instruments

17
00:01:19,380 --> 00:01:16,960
probed deep into the atmosphere of

18
00:01:22,740 --> 00:01:19,390
Saturn and gave us an unprecedented view

19
00:01:25,560 --> 00:01:22,750
of those incredible rings we now know

20
00:01:27,770 --> 00:01:25,570
there are six major ring systems made up

21
00:01:31,469 --> 00:01:27,780
of possibly as many as a thousand Rings

22
00:01:34,260 --> 00:01:31,479
the Rings are Sun reflecting icy objects

23
00:01:36,270 --> 00:01:34,270
ranging from Boulder sized to small

24
00:01:39,990 --> 00:01:36,280
particles that were all around the

25
00:01:43,050 --> 00:01:40,000
planet at very high speeds and those

26
00:01:45,510 --> 00:01:43,060
moons are satellites like outriders they

27
00:01:47,789 --> 00:01:45,520
encircle Saturn generating as much

28
00:01:54,109 --> 00:01:47,799
scientific interest as the great range

29
00:01:58,020 --> 00:01:54,119
planet itself my masseuse dyani Raya

30
00:02:00,510 --> 00:01:58,030
Titan and a host of smaller ones Melissa

31
00:02:02,370 --> 00:02:00,520
did more than a thousand journalists on

32
00:02:04,349 --> 00:02:02,380
hand to witness the encounter and

33
00:02:06,660 --> 00:02:04,359
attends a science briefings that follow

34
00:02:08,790 --> 00:02:06,670
now if this is in these were some of the

35
00:02:11,190 --> 00:02:08,800
storytellers the engineers and

36
00:02:13,620 --> 00:02:11,200
scientists want unsigned you that it's

37
00:02:14,910 --> 00:02:13,630
always gratifying to have the results be

38
00:02:17,550 --> 00:02:14,920

something more than what was expected

39
00:02:20,850 --> 00:02:17,560
and Saturn and what we have found was

40
00:02:23,940 --> 00:02:20,860
not expected I suspect even for the next

41
00:02:25,530 --> 00:02:23,950
few years we will find a new discoveries

42
00:02:27,660 --> 00:02:25,540
in the data which we've acquired in the

43
00:02:29,670 --> 00:02:27,670
last few days as we see more and more

44
00:02:31,050 --> 00:02:29,680
examples of the way the universe can put

45
00:02:32,880 --> 00:02:31,060
planets together we find that our

46
00:02:33,550 --> 00:02:32,890
terrestrial perspective in explaining

47
00:02:35,350 --> 00:02:33,560
our own

48
00:02:38,410 --> 00:02:35,360
planet has been rather limited we get

49
00:02:41,260 --> 00:02:38,420
new ideas from this what we learned

50
00:02:44,710 --> 00:02:41,270
about Saturn during that encounter and

51
00:02:47,880 --> 00:02:44,720
during the months that preceded it have

52
00:02:50,559 --> 00:02:47,890
really rewritten the textbooks on Saturn

53
00:02:53,380 --> 00:02:50,569
next August Voyager 2 will approach

54
00:02:55,540 --> 00:02:53,390
Saturn pass by the ring spectacle of gas

55
00:02:59,080 --> 00:02:55,550
and ice from a different angle and then

56
00:03:01,930 --> 00:02:59,090
fly on to Uranus arriving there in 1986

57
00:03:08,559 --> 00:03:01,940
it may also travel to Neptune before

58
00:03:11,220 --> 00:03:08,569
leaving our solar system from Earth it

59
00:03:15,520 --> 00:03:11,230
appears as a warm friendly ball an

60
00:03:18,039 --> 00:03:15,530
integral part of everything living but

61
00:03:20,440 --> 00:03:18,049
up close it's a churning solar furnace

62
00:03:22,479 --> 00:03:20,450
that spouts solar flares in an

63
00:03:25,479 --> 00:03:22,489

atmosphere that's constantly changing

64
00:03:28,420 --> 00:03:25,489
and explosive little wonder that our

65
00:03:30,670 --> 00:03:28,430
star the Sun has been the focal point of

66
00:03:34,059 --> 00:03:30,680
scientific investigation for centuries

67
00:03:37,360 --> 00:03:34,069
to relay sophisticated pictures and data

68
00:03:40,289 --> 00:03:37,370
about the Sun and its energy cycles nasa

69
00:03:44,050 --> 00:03:40,299
launched the solar max we might conclude

70
00:03:46,690 --> 00:03:44,060
short our solar maximum mckellar what if

71
00:03:49,210 --> 00:03:46,700
everyone being returned are the first

72
00:03:52,420 --> 00:03:49,220
true close-up views of the mysterious

73
00:03:55,690 --> 00:03:52,430
spots and solar flares that energize the

74
00:03:58,479 --> 00:03:55,700
Sun service all this part of an effort

75
00:04:01,860 --> 00:03:58,489
to learn how we can channel the Sun into

76
00:04:05,229 --> 00:04:01,870
an even more effective energy source

77
00:04:08,250 --> 00:04:05,239
closer to Earth sounding rockets probe

78
00:04:10,930 --> 00:04:08,260
below where satellites orbit and

79
00:04:13,120 --> 00:04:10,940
balloons carry heavy instruments that

80
00:04:16,690 --> 00:04:13,130
need a longer flight time than sounding

81
00:04:18,670 --> 00:04:16,700
rockets provide both play an important

82
00:04:21,099 --> 00:04:18,680
role in the scientific study of the

83
00:04:23,590 --> 00:04:21,109
Earth's atmosphere everything from

84
00:04:30,040 --> 00:04:23,600
measuring the amount of ozone to gamma

85
00:04:32,290 --> 00:04:30,050
ray radiation work on NASA's reusable

86
00:04:34,210 --> 00:04:32,300
space transportation system continued at

87
00:04:38,900 --> 00:04:34,220
many levels in preparation for the

88
00:04:43,530 --> 00:04:41,310

practice recovery runs were made to

89
00:04:45,390 --> 00:04:43,540
retrieve the two solid rocket boosters

90
00:04:47,760 --> 00:04:45,400
that will be used to help launch the

91
00:04:49,920 --> 00:04:47,770
space shuttle just before going into

92
00:04:51,990 --> 00:04:49,930
orbit the big rocket boosters parachute

93
00:04:53,580 --> 00:04:52,000
back to an ocean landing where they are

94
00:04:59,130 --> 00:04:53,590
picked up and made ready for another

95
00:05:01,320 --> 00:04:59,140
launch the shuttle orbiters main engines

96
00:05:03,840 --> 00:05:01,330
have successfully passed firing tests

97
00:05:08,210 --> 00:05:03,850
singly and clustered in a group of three

98
00:05:12,630 --> 00:05:10,500
installation of thermal tiles that

99
00:05:14,760 --> 00:05:12,640
protect the spacecraft from heat buildup

100
00:05:26,260 --> 00:05:14,770
during re-entry are now in place and

101
00:05:31,400 --> 00:05:28,610
this is how the entire space

102
00:05:33,620 --> 00:05:31,410
transportation system will look the

103
00:05:35,870 --> 00:05:33,630
airplane like orbiter is attached to the

104
00:05:40,040 --> 00:05:35,880
main fuel tank with the two solid rocket

105
00:05:41,990 --> 00:05:40,050
boosters on each side a new type space

106
00:05:44,300 --> 00:05:42,000
to zoom in the something to provide an

107
00:05:46,850 --> 00:05:44,310
earthlike in violence as well as thermal

108
00:05:49,160 --> 00:05:46,860
protection from the Sun the advanced

109
00:05:51,730 --> 00:05:49,170
space suits have three basic parts a

110
00:05:54,230 --> 00:05:51,740
body cooling under violet a

111
00:05:56,420 --> 00:05:54,240
puncture-resistant pressure suit and a

112
00:05:58,670 --> 00:05:56,430
life-support backpack which contains

113
00:06:01,550 --> 00:05:58,680

seven hours of oxygen and controls

114
00:06:04,640 --> 00:06:01,560
useless temperatures yeah this is

115
00:06:06,740 --> 00:06:04,650
astronaut Bob Crippen it is he and John

116
00:06:12,110 --> 00:06:06,750
Young who will pilot the first shuttle

117
00:06:14,000 --> 00:06:12,120
flight since the Shuttle Orbiter glides

118
00:06:16,430 --> 00:06:14,010
back to earth to an unpowered landing

119
00:06:18,410 --> 00:06:16,440
it's important for the astronauts to

120
00:06:21,380 --> 00:06:18,420
have practice these types of landings in

121
00:06:24,080 --> 00:06:21,390
advance they do just that with a

122
00:06:26,450 --> 00:06:24,090
specially modified jet plane designed to

123
00:06:30,230 --> 00:06:26,460
handle and feel the way the shuttle does

124
00:06:32,150 --> 00:06:30,240
during final approach and landing crews

125
00:06:34,730 --> 00:06:32,160
are also training on this vertical

126
00:06:37,160 --> 00:06:34,740
motion simulator it reproduces the

127
00:06:39,200 --> 00:06:37,170
motion and astronaut at the controls of

128
00:06:41,900 --> 00:06:39,210
the Shuttle Orbiter would feel during

129
00:06:45,140 --> 00:06:41,910
approach flare and landing without

130
00:06:47,210 --> 00:06:45,150
leaving the ground preparing for a busy

131
00:06:49,880 --> 00:06:47,220
shuttle flight in the years ahead nasa

132
00:06:52,580 --> 00:06:49,890
selected an additional 19 men and women

133
00:06:55,610 --> 00:06:52,590
to begin training as astronauts and that

134
00:06:57,800 --> 00:06:55,620
training is well underway it please many

135
00:06:59,990 --> 00:06:57,810
of the astronauts recruited earlier are

136
00:07:03,020 --> 00:07:00,000
willing to Florida man maneuvering unit

137
00:07:05,270 --> 00:07:03,030
a compressed gas backpack that will

138
00:07:08,140 --> 00:07:05,280

enable the wearer to move around outside

139
00:07:11,090 --> 00:07:08,150
the shuttle in space on future flights

140
00:07:12,680 --> 00:07:11,100
at another facility engineers are

141
00:07:14,420 --> 00:07:12,690
working to develop procedures and

142
00:07:17,390 --> 00:07:14,430
hardware that will be needed for

143
00:07:20,720 --> 00:07:17,400
astronauts to build large structures in

144
00:07:22,909 --> 00:07:20,730
space and they do it underwater more

145
00:07:27,130 --> 00:07:22,919
than a million gallons of water to

146
00:07:31,400 --> 00:07:27,140
simulate weightlessness people machines

147
00:07:33,620 --> 00:07:31,410
spacesuits engines slowly but surely a

148
00:07:35,070 --> 00:07:33,630
major effort is being focused on a

149
00:07:37,200 --> 00:07:35,080
single point

150
00:07:38,909 --> 00:07:37,210
the historic first flight of this

151
00:07:44,610 --> 00:07:38,919
country's new space transportation

152
00:07:46,890 --> 00:07:44,620
system at that time is near in space

153
00:07:49,050 --> 00:07:46,900
applications the goes for weather

154
00:07:50,760 --> 00:07:49,060
satellite was checked out and launched

155
00:07:53,700 --> 00:07:50,770
from the kennedy space center florida

156
00:07:55,950 --> 00:07:53,710
weather forecasters and other scientists

157
00:08:00,450 --> 00:07:55,960
are using the satellite to study severe

158
00:08:02,909 --> 00:08:00,460
storms flash floods and tornadoes this

159
00:08:05,580 --> 00:08:02,919
goes east satellite picture taken last

160
00:08:08,219 --> 00:08:05,590
summer shows both hurricane Allen over

161
00:08:11,879 --> 00:08:08,229
the Gulf of Mexico and hurricane Isis in

162
00:08:13,740 --> 00:08:11,889
the Pacific Ocean ever since the

163
00:08:16,170 --> 00:08:13,750

spectacular eruption of Mount st. Helens

164
00:08:22,680 --> 00:08:16,180
nASA has been working closely with other

165
00:08:25,529 --> 00:08:22,690
scientists to assess the impact one of

166
00:08:31,759 --> 00:08:25,539
NASA's high-altitude u2 aircraft sampled

167
00:08:35,969 --> 00:08:33,930
recently a plane from the langley

168
00:08:38,100 --> 00:08:35,979
research center in Virginia who a group

169
00:08:40,940 --> 00:08:38,110
of scientists and their instruments near

170
00:08:43,190 --> 00:08:40,950
the mountain other things

171
00:08:46,400 --> 00:08:43,200
to find out how much and what kind of

172
00:08:48,470 --> 00:08:46,410
gases come out of volcanoes worldwide

173
00:08:52,130 --> 00:08:48,480
there's very little volcano data

174
00:08:56,670 --> 00:08:54,720
NASA continued its movement towards

175
00:08:59,730 --> 00:08:56,680
making the Landsat satellite and

176
00:09:02,190 --> 00:08:59,740
operational remote sensing system both

177
00:09:04,500 --> 00:09:02,200
here and around the world Landsat is

178
00:09:06,510 --> 00:09:04,510
being viewed as a new tool for resource

179
00:09:10,560 --> 00:09:06,520
planning and a way to better manage

180
00:09:13,320 --> 00:09:10,570
agriculture and forestry energy from

181
00:09:16,290 --> 00:09:13,330
sunlight to power spacecraft is very

182
00:09:18,840 --> 00:09:16,300
important now technology is being

183
00:09:21,780 --> 00:09:18,850
studied as a way to harvest thermal

184
00:09:24,080 --> 00:09:21,790
energy from the Sun here on earth this

185
00:09:26,760 --> 00:09:24,090
is a research version of a solar farm

186
00:09:28,800 --> 00:09:26,770
the dish shaped concentrators are

187
00:09:31,350 --> 00:09:28,810
covered with mirrors which reflect and

188
00:09:33,090 --> 00:09:31,360

focus the sun's rays to a point where

189
00:09:36,330 --> 00:09:33,100
the intense heat is converted to

190
00:09:38,640 --> 00:09:36,340
electricity rows of these collectors may

191
00:09:42,300 --> 00:09:38,650
one day help provide electric power or a

192
00:09:44,370 --> 00:09:42,310
small city or factory it's part of a

193
00:09:46,410 --> 00:09:44,380
joint national effort by government and

194
00:09:50,009 --> 00:09:46,420
industry sponsored by the US Department

195
00:09:54,449 --> 00:09:52,769
NASA's Lewis Research Center also worked

196
00:09:56,939 --> 00:09:54,459
with the energy department to develop

197
00:10:00,389 --> 00:09:56,949
this two hundred thousand watt wind

198
00:10:02,639 --> 00:10:00,399
turbine generator Hawaii strong trains

199
00:10:05,189 --> 00:10:02,649
grow year-round making it an ideal

200
00:10:08,129 --> 00:10:05,199
location for electricity producing wind

201
00:10:11,429 --> 00:10:08,139
machines this one which began operation

202
00:10:15,809 --> 00:10:11,439
last July is located 45 miles north of

203
00:10:18,539 --> 00:10:15,819
Honolulu 1980 was a busy year for NASA's

204
00:10:20,960 --> 00:10:18,549
various aeronautics programs consider

205
00:10:23,910 --> 00:10:20,970
this rotor systems research aircraft

206
00:10:26,400 --> 00:10:23,920
these unique craft can be flown not only

207
00:10:29,160 --> 00:10:26,410
as helicopters but also with wings and

208
00:10:31,799 --> 00:10:29,170
jet engines the studies will investigate

209
00:10:34,079 --> 00:10:31,809
promising new helicopter technologies to

210
00:10:39,090 --> 00:10:34,089
improve performance reliability and

211
00:10:42,869 --> 00:10:39,100
safety this strange-looking plane is the

212
00:10:46,499 --> 00:10:42,879
Q SRA which means quiet short-haul

213
00:10:49,079 --> 00:10:46,509

research aircraft it can land at speeds

214
00:10:51,809 --> 00:10:49,089
slower than many light airplanes about

215
00:10:56,039 --> 00:10:51,819
75 miles per hour and can break to a

216
00:10:59,129 --> 00:10:56,049
stop in 600 feet in a cooperative test

217
00:11:02,129 --> 00:10:59,139
with the Navy last July the q SRA made

218
00:11:04,410 --> 00:11:02,139
37 touch-and-go landings and 16

219
00:11:07,019 --> 00:11:04,420
full-stop landings without the help of

220
00:11:10,410 --> 00:11:07,029
arresting gear or catapults aboard the

221
00:11:12,689 --> 00:11:10,420
carrier USS kitty hawk this was the

222
00:11:14,519 --> 00:11:12,699
first time a four-engine jet transport

223
00:11:17,939 --> 00:11:14,529
ever operated from an aircraft carrier

224
00:11:20,999 --> 00:11:17,949
at sea in the future the technology from

225
00:11:23,129 --> 00:11:21,009
the quiet flying q sra may also help

226
00:11:27,210 --> 00:11:23,139
improve transportation services too many

227
00:11:29,850 --> 00:11:27,220
airports with very short runways the xB

228
00:11:31,679 --> 00:11:29,860
15 tiltrotor is another research

229
00:11:34,409 --> 00:11:31,689
aircraft that shows promise for both

230
00:11:36,869 --> 00:11:34,419
military and civil applications in

231
00:11:38,369 --> 00:11:36,879
forever city transportation and for

232
00:11:41,819 --> 00:11:38,379
moved on people and equipment to

233
00:11:45,389 --> 00:11:41,829
offshore oil rigs the crashed helicopter

234
00:11:48,749 --> 00:11:45,399
like rotors allow the xB 15 to take off

235
00:11:51,299 --> 00:11:48,759
and land vertically once airborne the

236
00:11:54,689 --> 00:11:51,309
rotors tilt forward for cruise flight at

237
00:11:57,239 --> 00:11:54,699
over 300 miles per hour the tiltrotor

238
00:12:01,739 --> 00:11:57,249

concept achieves twice the range of a

239
00:12:06,910 --> 00:12:04,239
bridging the gap between wind tunnel

240
00:12:09,090 --> 00:12:06,920
models and full scale aircraft is hi

241
00:12:12,579 --> 00:12:09,100
Matt highly maneuverable aircraft

242
00:12:21,129 --> 00:12:12,589
technology after being carried along by

243
00:12:23,829 --> 00:12:21,139
a b-52 hi Matt drops away however their

244
00:12:26,139 --> 00:12:23,839
pilot murder leaves the garden from here

245
00:12:28,150 --> 00:12:26,149
he can fly the remotely piloted vehicle

246
00:12:31,119 --> 00:12:28,160
through any number of complex maneuvers

247
00:12:32,650 --> 00:12:31,129
and high speed turns this has proved to

248
00:12:34,269 --> 00:12:32,660
be an excellent technique for doing

249
00:12:36,519 --> 00:12:34,279
high-risk flight testing less

250
00:12:40,569 --> 00:12:36,529
expensively and with no danger to the

251
00:12:42,670 --> 00:12:40,579
pilot this small jet powered research

252
00:12:45,670 --> 00:12:42,680
plane takes off and lands like most

253
00:12:49,600 --> 00:12:45,680
aircraft but in flight it's unlike

254
00:12:52,480 --> 00:12:49,610
anything flying the pilot of the scissor

255
00:12:55,540 --> 00:12:52,490
wing concept plane can pivot the wing up

256
00:12:58,059 --> 00:12:55,550
to 60 degrees decreasing the air drag

257
00:13:00,069 --> 00:12:58,069
and making it possible to fly faster and

258
00:13:03,400 --> 00:13:00,079
farther without increasing fuel

259
00:13:06,299 --> 00:13:03,410
consumption the ad 1 scissor wing has

260
00:13:08,369 --> 00:13:06,309
made several successful flights at

261
00:13:12,530 --> 00:13:08,379
Manassas Airport in Northern Virginia

262
00:13:16,470 --> 00:13:12,540
pilots have always landed with no help

263
00:13:19,200 --> 00:13:16,480

but now something new is in the air it's

264
00:13:22,620 --> 00:13:19,210
an experimental automated pilot advisory

265
00:13:24,780 --> 00:13:22,630
system hey pass NASA's Wallops Flight

266
00:13:26,730 --> 00:13:24,790
Center developed a pass and has

267
00:13:29,010 --> 00:13:26,740
successfully demonstrated it at the

268
00:13:31,220 --> 00:13:29,020
Manassas airport in cooperation with the

269
00:13:33,810 --> 00:13:31,230
Federal Aviation Administration as

270
00:13:36,300 --> 00:13:33,820
pilots approached the airport they can

271
00:13:39,360 --> 00:13:36,310
turn their radios to a designated VHF

272
00:13:41,490 --> 00:13:39,370
channel and a Contreras voice tells the

273
00:13:44,370 --> 00:13:41,500
Randall ok cono an old congrats to

274
00:13:47,070 --> 00:13:44,380
allowing back mile down one getting wet

275
00:13:49,500 --> 00:13:47,080
the FAA will now determine the merits of

276
00:13:51,510 --> 00:13:49,510
this and a similar automated system for

277
00:13:53,550 --> 00:13:51,520
possible use at many small airports

278
00:13:55,470 --> 00:13:53,560
around the country adding a greater

279
00:14:00,330 --> 00:13:55,480
margin of safety for general aviation

280
00:14:03,000 --> 00:14:00,340
violence from the voyager 1 flyby of

281
00:14:05,220 --> 00:14:03,010
saturn to preparations for the space

282
00:14:07,980 --> 00:14:05,230
shuttle and a wide range of research

283
00:14:10,440 --> 00:14:07,990
aircraft projects 1980 was an

284
00:14:22,489 --> 00:14:10,450
interesting and productive year in both

285
00:14:27,289 --> 00:14:24,799
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