1
00:00:18,150 --> 00:00:13,190
arranges clear for launch

2
00:00:20,280 --> 00:00:18,160
barring system armed it is may 9 1990

3
00:00:21,540 --> 00:00:20,290
the place is Vandenberg Air Force Base

4
00:00:23,910 --> 00:00:21,550
in California

5
00:00:26,580 --> 00:00:23,920
operations manager Larry tant is

6
00:00:28,500 --> 00:00:26,590
counting down to liftoff of the 113th

7
00:00:45,470 --> 00:00:28,510
flight of one of the United States most

8
00:00:51,510 --> 00:00:49,590
the mission is a success success comes

9
00:00:54,020 --> 00:00:51,520
as no surprise to the planners designers

10
00:00:57,450 --> 00:00:54,030
engineers and controllers of scout

11
00:00:59,250 --> 00:00:57,460
success is the result of over 30 years

12
00:01:00,500 --> 00:00:59,260
of striving for letter-perfect

13
00:01:02,970 --> 00:01:00,510

performance

14
00:01:05,940 --> 00:01:02,980
the story of scout is little known

15
00:01:08,730 --> 00:01:05,950
outside of NASA circles but it's a story

16
00:01:12,300 --> 00:01:08,740
worth knowing it's a story of triumph

17
00:01:30,490 --> 00:01:12,310
over adversity of teamwork and of the

18
00:01:35,960 --> 00:01:33,830
in the early decades of the 20th century

19
00:01:37,490 --> 00:01:35,970
the study of flight is the work of the

20
00:01:40,030 --> 00:01:37,500
National Advisory Committee on

21
00:01:42,440 --> 00:01:40,040
Aeronautics or NACA

22
00:01:44,360 --> 00:01:42,450
this work is done at the Langley

23
00:01:47,210 --> 00:01:44,370
aeronautical laboratory in Hampton

24
00:01:50,780 --> 00:01:47,220
Virginia Langley engineers study the

25
00:01:52,520 --> 00:01:50,790
phenomena of drag and of lift they study

26
00:01:55,580 --> 00:01:52,530
the shape of wings and how to cool

27
00:01:57,320 --> 00:01:55,590
aircraft engines and flight many Langley

28
00:01:59,510 --> 00:01:57,330
innovations directly contribute to

29
00:02:06,920 --> 00:01:59,520
improvements in airplane design in world

30
00:02:08,930 --> 00:02:06,930
war ii in the period after the war the

31
00:02:12,080 --> 00:02:08,940
challenge in aerodynamics is to break

32
00:02:14,360 --> 00:02:12,090
the so-called sound barrier gathering

33
00:02:16,880 --> 00:02:14,370
aerodynamic data at high speeds is a

34
00:02:18,830 --> 00:02:16,890
complicated problem one approach to a

35
00:02:21,650 --> 00:02:18,840
solution is to improve the design of

36
00:02:23,990 --> 00:02:21,660
existing wind tunnels another is to

37
00:02:27,110 --> 00:02:24,000
conduct tests of airplane configurations

38
00:02:29,510 --> 00:02:27,120

on rockets these tests are conducted by

39
00:02:34,130 --> 00:02:29,520
the pilotless research aircraft division

40
00:02:36,790 --> 00:02:34,140
or PA Rd they are launched from the NACA

41
00:02:40,180 --> 00:02:36,800
s Wallops Island Virginia test facility

42
00:02:42,170 --> 00:02:40,190
it was basically a technique to verify

43
00:02:43,640 --> 00:02:42,180
some of the parameters that were

44
00:02:45,800 --> 00:02:43,650
obtained the wind tunnels of various

45
00:02:49,820 --> 00:02:45,810
airplanes in that transonic speed range

46
00:02:51,770 --> 00:02:49,830
it is 1957 as technology advances and

47
00:02:54,979 --> 00:02:51,780
the problems of supersonic flight are

48
00:02:57,110 --> 00:02:54,989
resolved the engineers of PA Rd are

49
00:03:01,040 --> 00:02:57,120
tantalized by the prospect of achieving

50
00:03:03,170 --> 00:03:01,050
orbit then the Soviet Union startles the

51
00:03:06,309 --> 00:03:03,180
world by launching the first satellite

52
00:03:08,800 --> 00:03:06,319
into outer space Sputnik

53
00:03:10,739 --> 00:03:08,810
this technological achievement startles

54
00:03:13,679 --> 00:03:10,749
the world and surprises everyone

55
00:03:16,780 --> 00:03:13,689
including Langley's rocket specialists

56
00:03:19,449 --> 00:03:16,790
you gotta respect their accomplishment

57
00:03:23,649 --> 00:03:19,459
in its own right disappointed you didn't

58
00:03:25,839 --> 00:03:23,659
do it yourself it forces you to think at

59
00:03:29,440 --> 00:03:25,849
a whole new level of exploration and

60
00:03:32,729 --> 00:03:29,450
science that heretofore was beyond

61
00:03:36,190 --> 00:03:32,739
consideration with us it was

62
00:03:41,470 --> 00:03:36,200
disappointment that we weren't there

63
00:03:45,490 --> 00:03:41,480

first of course but it was also in a

64
00:03:47,349 --> 00:03:45,500
sense an assurance that we were on the

65
00:03:48,909 --> 00:03:47,359
right track that boy we really would get

66
00:03:51,009 --> 00:03:48,919
supported from now on because this was

67
00:03:52,390 --> 00:03:51,019
important and it was obviously it was

68
00:03:56,500 --> 00:03:52,400
important that the United States would

69
00:03:59,229 --> 00:03:56,510
continue and happen and we were part of

70
00:04:01,089 --> 00:03:59,239
that game the United States responds by

71
00:04:02,619 --> 00:04:01,099
mounting a comprehensive program of

72
00:04:05,709 --> 00:04:02,629
missile development and space

73
00:04:07,439 --> 00:04:05,719
exploration as part of its response the

74
00:04:10,119 --> 00:04:07,449
nation needs a relatively inexpensive

75
00:04:13,179 --> 00:04:10,129
quickly produced rocket to launch small

76
00:04:16,349 --> 00:04:13,189
research experiments the engineers at PA

77
00:04:18,580 --> 00:04:16,359
Rd are asked to design the new rocket

78
00:04:21,430 --> 00:04:18,590
solid-fueled rocket have already always

79
00:04:24,909 --> 00:04:21,440
had the advantage over liquid fuels as

80
00:04:28,960 --> 00:04:24,919
more simplicity is consumed and cost and

81
00:04:31,029 --> 00:04:28,970
possibly even reliability so it was

82
00:04:33,310 --> 00:04:31,039
decided that Scout would use all solid

83
00:04:36,060 --> 00:04:33,320
for falchion and what is a matter of

84
00:04:38,890 --> 00:04:36,070
fact to the extent possible use existing

85
00:04:41,050 --> 00:04:38,900
solid fuel Rockets there's a various

86
00:04:43,779 --> 00:04:41,060
stages with launch vehicle so it was a

87
00:04:45,610 --> 00:04:43,789
natural extension of the of their work

88
00:04:48,879 --> 00:04:45,620

that was going on in PA our deal

89
00:04:51,010 --> 00:04:48,889
solid rockets in 1958 President

90
00:04:53,830 --> 00:04:51,020
Eisenhower signs the National

91
00:04:56,050 --> 00:04:53,840
Aeronautics and Space Act into law this

92
00:04:58,810 --> 00:04:56,060
act dissolves the NACA

93
00:05:01,540 --> 00:04:58,820
taking its place is the National

94
00:05:03,700 --> 00:05:01,550
Aeronautics and Space Administration the

95
00:05:07,540 --> 00:05:03,710
agency that is charged with running the

96
00:05:09,670 --> 00:05:07,550
space race for the United States the

97
00:05:11,020 --> 00:05:09,680
need to save time and money means that

98
00:05:14,170 --> 00:05:11,030
the rocket must be built with

99
00:05:16,209 --> 00:05:14,180
off-the-shelf hardware designers select

100
00:05:18,490 --> 00:05:16,219
from an inventory of solid fuel rocket

101
00:05:21,100 --> 00:05:18,500
motors produced for the military

102
00:05:23,260 --> 00:05:21,110
the first-stage algol motor is a

103
00:05:26,890 --> 00:05:23,270
combination of the jupiter senior and

104
00:05:29,620 --> 00:05:26,900
propellant from the Navy Polaris the

105
00:05:32,260 --> 00:05:29,630
second stage cast or comes from the Army

106
00:05:34,180 --> 00:05:32,270
sergeant and the third and fourth stage

107
00:05:37,890 --> 00:05:34,190
motors are designed by Langley engineers

108
00:05:40,150 --> 00:05:37,900
who adapt a version of the Navy Vanguard

109
00:05:41,320 --> 00:05:40,160
frenzy because we were thrown into it

110
00:05:43,380 --> 00:05:41,330
especially you got to remember I was a

111
00:05:45,310 --> 00:05:43,390
young fella we were thrown into

112
00:05:49,630 --> 00:05:45,320
something that never been done before

113
00:05:51,670 --> 00:05:49,640

and we would post a lot of dead ends if

114
00:05:55,510 --> 00:05:51,680
you will in a way it was a kind of a

115
00:05:57,460 --> 00:05:55,520
race to match the Russians but more

116
00:05:59,980 --> 00:05:57,470
importantly it was a it was to prove

117
00:06:05,310 --> 00:05:59,990
something to ourselves people did work

118
00:06:08,140 --> 00:06:05,320
hard and they were selfless about

119
00:06:10,900 --> 00:06:08,150
helping each other and there's no

120
00:06:13,990 --> 00:06:10,910
distinction drawn between government and

121
00:06:17,980 --> 00:06:14,000
contractor people on the job

122
00:06:19,630 --> 00:06:17,990
everybody's on this team and they did

123
00:06:23,380 --> 00:06:19,640
what they had to do without regard to

124
00:06:25,840 --> 00:06:23,390
the color of their badge in 1959 NASA

125
00:06:28,750 --> 00:06:25,850
Langley Awards contracts for control and

126
00:06:31,630 --> 00:06:28,760
guidance systems Chance Vought aircraft

127
00:06:34,150 --> 00:06:31,640
now LTV missile and electronics group of

128
00:06:36,790 --> 00:06:34,160
Dallas wins the bid on the contract to

129
00:06:38,740 --> 00:06:36,800
develop the airframe and launcher this

130
00:06:41,920 --> 00:06:38,750
begins a partnership between NASA

131
00:06:45,480 --> 00:06:41,930
Langley and LTV that will last for over

132
00:06:50,260 --> 00:06:45,490
30 years we all underestimated the

133
00:06:55,150 --> 00:06:50,270
magnitude of the job at that time but we

134
00:06:58,750 --> 00:06:55,160
all had a real positive aggressive

135
00:07:01,030 --> 00:06:58,760
attitude that we would get it done in a

136
00:07:02,980 --> 00:07:01,040
race against the calendar this is the

137
00:07:06,010 --> 00:07:02,990
vehicle that NASA and its contractors

138
00:07:08,860 --> 00:07:06,020

are working overtime to build in its

139
00:07:12,219 --> 00:07:08,870
original configuration Scout is designed

140
00:07:14,800 --> 00:07:12,229
to place 130 pound payloads into a 300

141
00:07:17,719 --> 00:07:14,810
mile orbit above the earth it will later

142
00:07:20,659 --> 00:07:17,729
be able to carry a 450 pound

143
00:07:22,939 --> 00:07:20,669
it consists of four solid propulsion

144
00:07:25,999 --> 00:07:22,949
rockets joined by transition sections

145
00:07:28,459 --> 00:07:26,009
containing guidance ignition spin up

146
00:07:31,099 --> 00:07:28,469
motors and separation sections needed

147
00:07:33,559 --> 00:07:31,109
for flight the heat shield covering the

148
00:07:36,709 --> 00:07:33,569
fourth stage and payload section is made

149
00:07:38,779 --> 00:07:36,719
of cork and fiberglass laminate the

150
00:07:42,049 --> 00:07:38,789
Scout will fly several missions with an

151
00:07:45,919 --> 00:07:42,059
optional fifth stage Scout stands some

152
00:07:48,769 --> 00:07:45,929
75 feet tall and weighs over 48,000

153
00:07:59,059 --> 00:07:48,779
pounds a comparatively small vehicle

154
00:08:01,629 --> 00:07:59,069
that will accomplish much the first test

155
00:08:05,179 --> 00:08:01,639
flight of scout takes place on July 1st

156
00:08:07,669 --> 00:08:05,189
1960 this mission is designed as a probe

157
00:08:10,279 --> 00:08:07,679
and carries a 193 pound

158
00:08:12,079 --> 00:08:10,289
Langley Research Center payload the

159
00:08:15,199 --> 00:08:12,089
Scout also carries another new feature

160
00:08:16,969 --> 00:08:15,209
on board a destruct capability to be

161
00:08:23,320 --> 00:08:16,979
used in the event the rocket goes off

162
00:08:28,360 --> 00:08:26,260
our launch starts well yet trouble

163
00:08:30,850 --> 00:08:28,370

arises when the radar tracking indicates

164
00:08:33,159 --> 00:08:30,860
that the rocket is off-course the Range

165
00:08:35,709 --> 00:08:33,169
Safety Officer orders the radio command

166
00:08:39,310 --> 00:08:35,719
to destroy the rocket after reaching an

167
00:08:42,759 --> 00:08:39,320
altitude of 860 miles the first Scout

168
00:08:44,590 --> 00:08:42,769
falls into the Atlantic only later will

169
00:08:46,389 --> 00:08:44,600
the scout team learned that the failure

170
00:08:48,340 --> 00:08:46,399
is with the ground tracking system

171
00:08:50,319 --> 00:08:48,350
rather than the rocket that was a

172
00:08:52,990 --> 00:08:50,329
crushing blow to have destroyed a

173
00:09:01,900 --> 00:08:53,000
vehicle that was doing exactly what had

174
00:09:07,780 --> 00:09:04,660
but they kicked ashcans and cussed the

175
00:09:18,900 --> 00:09:07,790
lunch the Range Safety Officer and cried

176
00:09:22,570 --> 00:09:18,910
and just went away to be alone then and

177
00:09:24,880 --> 00:09:22,580
Woodward acted like they'd lost a child

178
00:09:27,100 --> 00:09:24,890
we wouldn't learn anything if we didn't

179
00:09:29,110 --> 00:09:27,110
have problems and I think if that's the

180
00:09:32,140 --> 00:09:29,120
basic I think that's basic in

181
00:09:34,690 --> 00:09:32,150
engineering training is that you you try

182
00:09:38,170 --> 00:09:34,700
something and if it works it's fine if

183
00:09:42,090 --> 00:09:38,180
it doesn't work but the problem was this

184
00:09:45,100 --> 00:09:42,100
is how we learn this is the process the

185
00:09:47,020 --> 00:09:45,110
first fully successful launch of scout

186
00:09:51,310 --> 00:09:47,030
takes place three years after Sputnik

187
00:09:53,980 --> 00:09:51,320
one carrying a 78 pound probe scout test

188
00:09:56,800 --> 00:09:53,990

two reaches an altitude of 3,500 miles

189
00:09:59,140 --> 00:09:56,810
before returning to Earth at this point

190
00:10:01,240 --> 00:09:59,150
Scout designers and engineers believe

191
00:10:04,120 --> 00:10:01,250
the testing is complete and that the

192
00:10:06,160 --> 00:10:04,130
missile is ready to start service Scout

193
00:10:08,080 --> 00:10:06,170
is designed to launch three types of

194
00:10:10,630 --> 00:10:08,090
missions to place satellites in Earth

195
00:10:13,570 --> 00:10:10,640
orbit to test heat-resistant materials

196
00:10:15,340 --> 00:10:13,580
and to launch space probes Scouts are

197
00:10:17,470 --> 00:10:15,350
launched from Wallops Island and from

198
00:10:22,330 --> 00:10:17,480
the Western Test range at Vandenberg Air

199
00:10:24,820 --> 00:10:22,340
Force Base in California the infancy of

200
00:10:27,220 --> 00:10:24,830
the space age is a time of exhilarating

201
00:10:29,860 --> 00:10:27,230
success and a heart-rending failure

202
00:10:31,000 --> 00:10:29,870
scout test three the first orbital

203
00:10:33,400 --> 00:10:31,010
attempt

204
00:10:35,920 --> 00:10:33,410
three of the first six flights are

205
00:10:39,250 --> 00:10:35,930
failures in one five-month period in

206
00:10:42,250 --> 00:10:39,260
1962 there are three failures in four

207
00:10:44,320 --> 00:10:42,260
launches a NASA investigation finds

208
00:10:47,650 --> 00:10:44,330
fault with electrical systems the heat

209
00:10:49,260 --> 00:10:47,660
shield design and ignition systems Scout

210
00:10:51,400 --> 00:10:49,270
program was done in Iraq

211
00:10:52,900 --> 00:10:51,410
unquestionably everything was running

212
00:10:56,620 --> 00:10:52,910
behind schedule and there was pressure

213
00:10:59,590 --> 00:10:56,630

on NASA to perform the Space Act had

214
00:11:02,740 --> 00:10:59,600
been passed and and NASA was supposed to

215
00:11:06,010 --> 00:11:02,750
be gearing up to do a job and scope was

216
00:11:08,050 --> 00:11:06,020
part of that job and so there was very

217
00:11:08,410 --> 00:11:08,060
definitely was pressure to do it in a

218
00:11:13,960 --> 00:11:08,420
hurry

219
00:11:18,100 --> 00:11:13,970
emphasis on properly qualifying and

220
00:11:21,280 --> 00:11:18,110
really getting ready for inoculation the

221
00:11:24,400 --> 00:11:21,290
flight of scout 1:10 in June of 1963

222
00:11:26,410 --> 00:11:24,410
symbolizes those problems at two and a

223
00:11:29,050 --> 00:11:26,420
half seconds after liftoff a flame

224
00:11:31,420 --> 00:11:29,060
appears above the first stage fins two

225
00:11:33,790 --> 00:11:31,430
seconds later the algal stage is

226
00:11:35,530 --> 00:11:33,800
engulfed by fire it's obvious that

227
00:11:37,450 --> 00:11:35,540
something terrible had happened to tell

228
00:11:41,710 --> 00:11:37,460
it from the communications of the plane

229
00:11:43,190 --> 00:11:41,720
safety then I burn through the first

230
00:11:45,260 --> 00:11:43,200
stage in awesome

231
00:11:49,220 --> 00:11:45,270
I believe about 15 seconds in the paper

232
00:11:53,470 --> 00:11:49,230
and the vehicle went through see why all

233
00:11:56,810 --> 00:11:53,480
the gyrations in it got about 300 feet I

234
00:11:58,580 --> 00:11:56,820
broke into three parts the first stage

235
00:12:01,460 --> 00:11:58,590
went one direction in the second stage

236
00:12:03,340 --> 00:12:01,470
another third and fourth fell more or

237
00:12:07,940 --> 00:12:03,350
less back on the launch pad and burned

238
00:12:09,470 --> 00:12:07,950

was a disaster I headed up a recovery

239
00:12:11,570 --> 00:12:09,480
team the next morning that was out

240
00:12:14,240 --> 00:12:11,580
slogging through the salt marsh

241
00:12:16,220 --> 00:12:14,250
gathering up pieces and bits and parts

242
00:12:18,220 --> 00:12:16,230
to see if we could put the story back

243
00:12:22,940 --> 00:12:18,230
together as to what had gone wrong and

244
00:12:26,060 --> 00:12:22,950
someone had parked a small car inside of

245
00:12:29,600 --> 00:12:26,070
one of the simply buildings and it just

246
00:12:31,880 --> 00:12:29,610
so happened that a flaming piece of

247
00:12:35,180 --> 00:12:31,890
green I guess had come down and gone

248
00:12:37,640 --> 00:12:35,190
through the roof of that building and it

249
00:12:40,070 --> 00:12:37,650
was a small sports car with a canvas top

250
00:12:42,050 --> 00:12:40,080
I guess and that grain had landed right

251
00:12:44,390 --> 00:12:42,060
in the front seat of that car I guess

252
00:12:46,460 --> 00:12:44,400
I'm just kind of burnt to a crisp NASA

253
00:12:48,830 --> 00:12:46,470
launches another investigation a

254
00:12:51,440 --> 00:12:48,840
seven-man review committee finds flaws

255
00:12:53,920 --> 00:12:51,450
in a rocket nozzle flaws that had gone

256
00:12:57,200 --> 00:12:53,930
undetected during production and testing

257
00:12:59,560 --> 00:12:57,210
NASA imposes a 3-month moratorium on the

258
00:13:02,030 --> 00:12:59,570
launch schedule to study the launch data

259
00:13:04,430 --> 00:13:02,040
repeated investigations of the Rockets

260
00:13:06,740 --> 00:13:04,440
subsystems revealed that failure is

261
00:13:10,790 --> 00:13:06,750
always caused by a different problem

262
00:13:13,280 --> 00:13:10,800
that in itself it's the big problem we

263
00:13:14,960 --> 00:13:13,290

never had the same failure twice but it

264
00:13:17,510 --> 00:13:14,970
was clear from the early record of scout

265
00:13:19,070 --> 00:13:17,520
that there were there were enough

266
00:13:22,280 --> 00:13:19,080
miscellaneous failures that we had to

267
00:13:24,710 --> 00:13:22,290
sit down and and and relook at this

268
00:13:26,330 --> 00:13:24,720
thing seriously and they did things

269
00:13:28,610 --> 00:13:26,340
differently at Wallops Island than they

270
00:13:30,920 --> 00:13:28,620
did Western Test range the Air Force had

271
00:13:32,990 --> 00:13:30,930
their own way of doing things the

272
00:13:35,090 --> 00:13:33,000
contract had different ways and there

273
00:13:37,010 --> 00:13:35,100
was a problem of coordinating that back

274
00:13:40,250 --> 00:13:37,020
in those days in the early days of the

275
00:13:42,050 --> 00:13:40,260
program if you needed a part you would

276
00:13:44,000 --> 00:13:42,060
do a little what they call midnight

277
00:13:47,330 --> 00:13:44,010
requisition you would go get the part

278
00:13:49,400 --> 00:13:47,340
from the spare vehicle in inventory well

279
00:13:51,290 --> 00:13:49,410
that was obviously one of the

280
00:13:53,690 --> 00:13:51,300
shortcomings of the system people were

281
00:13:55,400 --> 00:13:53,700
robbing Peter to pay Paul and in the end

282
00:13:56,540 --> 00:13:55,410
result was they had an unsuccessful

283
00:14:01,389 --> 00:13:56,550
vehicle

284
00:14:03,980 --> 00:14:01,399
there simply was not a good standardized

285
00:14:07,400 --> 00:14:03,990
vehicle configuration and checkout

286
00:14:08,960 --> 00:14:07,410
procedures which were needed to have a

287
00:14:11,540 --> 00:14:08,970
successful vehicle

288
00:14:13,730 --> 00:14:11,550

I remember that I sat down and and and

289
00:14:15,079 --> 00:14:13,740
did some deep thinking about what it

290
00:14:19,150 --> 00:14:15,089
would how we ought to take and

291
00:14:23,210 --> 00:14:19,160
restructure a look at this air at this

292
00:14:25,100 --> 00:14:23,220
rocket this launch vehicle and I wrote a

293
00:14:27,370 --> 00:14:25,110
specification which ultimately became

294
00:14:31,870 --> 00:14:27,380
the spec for the recertification program

295
00:14:36,199 --> 00:14:31,880
that was a was a tiger team approach to

296
00:14:39,350 --> 00:14:36,209
completely revising the way we handled

297
00:14:42,980 --> 00:14:39,360
the vehicle and and in standardizing the

298
00:14:45,079 --> 00:14:42,990
process to the ultimate degree the scout

299
00:14:47,840 --> 00:14:45,089
team mounts an attack on these problems

300
00:14:50,569 --> 00:14:47,850
with a 14-month reliability improvement

301
00:14:53,360 --> 00:14:50,579
program a recertification of the rocket

302
00:14:55,519 --> 00:14:53,370
all 27 of the scouts in the inventory

303
00:14:59,300 --> 00:14:55,529
are returned to Dallas to be taken apart

304
00:15:00,949 --> 00:14:59,310
and inspected weld seems our x-rayed and

305
00:15:03,620 --> 00:15:00,959
solder joints are checked under

306
00:15:06,860 --> 00:15:03,630
microscopes everything is standardized

307
00:15:09,350 --> 00:15:06,870
test equipment procedures even the cable

308
00:15:11,720 --> 00:15:09,360
lengths in watts labs will be matched at

309
00:15:14,530 --> 00:15:11,730
the launch sites the launch countdown

310
00:15:17,120 --> 00:15:14,540
now covers more than 800 checklist items

311
00:15:18,680 --> 00:15:17,130
special Tiger teams are formed and

312
00:15:21,199 --> 00:15:18,690
assigned to monitor each vehicle

313
00:15:24,410 --> 00:15:21,209

processed to enforce compliance with the

314
00:15:26,630 --> 00:15:24,420
new standards no Scout will leave Dallas

315
00:15:28,400 --> 00:15:26,640
until inspectors make a complete flight

316
00:15:30,230 --> 00:15:28,410
worthiness review of the vehicle and

317
00:15:33,410 --> 00:15:30,240
give it a clean bill of health

318
00:15:35,720 --> 00:15:33,420
no scout will ever fly again without

319
00:15:46,280 --> 00:15:35,730
being certified by this rigorous process

320
00:15:52,500 --> 00:15:49,920
the passion for reliability for zero

321
00:16:00,259 --> 00:15:52,510
defects is put to a test on December

322
00:16:07,470 --> 00:16:05,009
the launch of Scout 122 R is a success

323
00:16:11,100 --> 00:16:07,480
the relief among the Scout crew is

324
00:16:15,119 --> 00:16:11,110
evident it's kind of relief that the

325
00:16:18,179 --> 00:16:15,129
pressure isn't on you anymore to to go

326
00:16:21,960 --> 00:16:18,189
into failure reviews and go into you

327
00:16:25,610 --> 00:16:21,970
know overtime weekends away from your

328
00:16:29,550 --> 00:16:28,199
and I think it's very exhilarating I

329
00:16:33,059 --> 00:16:29,560
think the results speak for themselves

330
00:16:36,949 --> 00:16:33,069
we we went on a upward motion of

331
00:16:40,860 --> 00:16:36,959
successes in a period between 1964 and

332
00:16:43,110 --> 00:16:40,870
1966 scout establishes a record of 22

333
00:16:45,929 --> 00:16:43,120
consecutive successful launches and

334
00:16:49,829 --> 00:16:45,939
scout becomes a fully operational launch

335
00:16:57,340 --> 00:16:49,839
vehicle 15 of the 16 recertified rockets

336
00:17:06,890 --> 00:17:00,920
now we really had the kind of vehicle

337
00:17:09,020 --> 00:17:06,900
which setup reliable it was still simple

338
00:17:11,360 --> 00:17:09,030

and inexpensive we could launch him

339
00:17:14,990 --> 00:17:11,370
quickly it took about six weeks I think

340
00:17:16,730 --> 00:17:15,000
the process in the field and we were

341
00:17:18,049 --> 00:17:16,740
launching up to ten a year with no

342
00:17:19,640 --> 00:17:18,059
problem

343
00:17:22,640 --> 00:17:19,650
we were doing the job we set out for

344
00:17:24,350 --> 00:17:22,650
didn't scouts reliability also stems

345
00:17:28,130 --> 00:17:24,360
from a sense of teamwork and cooperation

346
00:17:30,620 --> 00:17:28,140
between NASA and its prime contractor on

347
00:17:35,000 --> 00:17:30,630
the program this language staff which

348
00:17:37,340 --> 00:17:35,010
were excellent engineers and were the

349
00:17:39,290 --> 00:17:37,350
kind of guys that get consumed by a

350
00:17:41,150 --> 00:17:39,300
project they work hard to accomplish it

351
00:17:43,790 --> 00:17:41,160
they have high ideals and high

352
00:17:46,190 --> 00:17:43,800
aspirations they know how to work with

353
00:17:49,720 --> 00:17:46,200
each other to get a job done and they

354
00:17:52,220 --> 00:17:49,730
and that enthusiasm and that honesty

355
00:17:54,370 --> 00:17:52,230
found itself reflected in the

356
00:17:57,140 --> 00:17:54,380
contractors attitude for just a very

357
00:18:03,919 --> 00:17:57,150
close-knit dedicated group and we had a

358
00:18:07,120 --> 00:18:03,929
lot of pride in what we're doing and we

359
00:18:10,100 --> 00:18:07,130
were like brothers we were very very

360
00:18:14,510 --> 00:18:10,110
much more liable to work together than

361
00:18:16,400 --> 00:18:14,520
we were to work apart is the your

362
00:18:19,640 --> 00:18:16,410
counterpart in the government would have

363
00:18:22,190 --> 00:18:19,650

a problem or a question he would contact

364
00:18:25,640 --> 00:18:22,200
you on the telephone and he would be

365
00:18:28,700 --> 00:18:25,650
able to say a mutual agreement or

366
00:18:31,700 --> 00:18:28,710
solution to that problem and end result

367
00:18:34,760 --> 00:18:31,710
would be that the program would be much

368
00:18:37,280 --> 00:18:34,770
better off for having experienced this

369
00:18:44,419 --> 00:18:37,290
degree of cooperation between between

370
00:18:49,290 --> 00:18:46,740
improvements in rocket motors enable the

371
00:18:50,640 --> 00:18:49,300
Scout to carry larger payloads the

372
00:18:54,150 --> 00:18:50,650
scouts weight carrying capability

373
00:18:57,600 --> 00:18:54,160
increases by several times while costs

374
00:19:01,680 --> 00:18:57,610
remain low now the performance is four

375
00:19:05,370 --> 00:19:01,690
or five times what it was beginning but

376
00:19:09,360 --> 00:19:05,380
controlled costs the cranking inflation

377
00:19:11,970 --> 00:19:09,370
as measured by the consumer price index

378
00:19:17,850 --> 00:19:11,980
the Scout costs less today than it did

379
00:19:20,430 --> 00:19:17,860
in 1958 taking note of the success and

380
00:19:22,410 --> 00:19:20,440
economy of scout other countries seek

381
00:19:25,410 --> 00:19:22,420
out the Scout to assist them in their

382
00:19:28,350 --> 00:19:25,420
fledgling space efforts the scouts honor

383
00:19:30,530 --> 00:19:28,360
role includes 23 satellites launched for

384
00:19:32,880 --> 00:19:30,540
international space organizations

385
00:19:35,520 --> 00:19:32,890
payloads are launched for the European

386
00:19:38,790 --> 00:19:35,530
Space Research Organization for Germany

387
00:19:41,549 --> 00:19:38,800
for the Netherlands for friends and for

388
00:19:44,190 --> 00:19:41,559

the United Kingdom after establishing a

389
00:19:47,160 --> 00:19:44,200
record full reliability that includes 37

390
00:19:51,090 --> 00:19:47,170
successful launches in a row the scout

391
00:19:54,450 --> 00:19:51,100
team celebrates its 100th launch the UK

392
00:19:57,360 --> 00:19:54,460
six spacecraft launch was the 100th

393
00:20:01,350 --> 00:19:57,370
Scout the launch and of course it was

394
00:20:05,490 --> 00:20:01,360
successful it was in June 2nd 1979 I

395
00:20:07,220 --> 00:20:05,500
believe there was a lot of PR made over

396
00:20:09,210 --> 00:20:07,230
because of the hunt it's launched

397
00:20:12,970 --> 00:20:09,220
locally there were a lot of people that

398
00:20:15,190 --> 00:20:12,980
went to see the launch it was at Wallops

399
00:20:34,360 --> 00:20:15,200
night launch so there was a lot of

400
00:20:37,090 --> 00:20:34,370
fanfare a lot of notoriety throughout

401
00:20:39,700 --> 00:20:37,100
its 30-year history Scout is involved

402
00:20:41,860 --> 00:20:39,710
with many NASA firsts one of the most

403
00:20:45,909 --> 00:20:41,870
internationally recognized projects for

404
00:20:49,150 --> 00:20:45,919
Scout is the San Marco project in May of

405
00:20:51,220 --> 00:20:49,160
1961 Italy and the United States enter

406
00:20:53,350 --> 00:20:51,230
an agreement by which NASA agrees to

407
00:20:56,200 --> 00:20:53,360
supply launch vehicles tracking and

408
00:20:57,820 --> 00:20:56,210
training to Italian launch teams the

409
00:21:01,419 --> 00:20:57,830
Italians are to provide the launch

410
00:21:03,760 --> 00:21:01,429
complex personnel and satellites the

411
00:21:07,180 --> 00:21:03,770
italians propose an unusual launch site

412
00:21:09,190 --> 00:21:07,190
two platforms in in Guana bay anchored

413
00:21:12,190 --> 00:21:09,200

three miles off the coast of Kenya in

414
00:21:14,560 --> 00:21:12,200
international waters this third launch

415
00:21:19,780 --> 00:21:14,570
site provides an equatorial orbit to the

416
00:21:23,440 --> 00:21:19,790
Scout Program the reason for choosing to

417
00:21:25,539 --> 00:21:23,450
establish this type of launcher was that

418
00:21:28,500 --> 00:21:25,549
the Italian government didn't want to go

419
00:21:31,210 --> 00:21:28,510
through the political whatever of

420
00:21:35,020 --> 00:21:31,220
reaching agreements with a foreign

421
00:21:37,120 --> 00:21:35,030
government to establish a launch base in

422
00:21:39,070 --> 00:21:37,130
that territory but they wanted

423
00:21:41,470 --> 00:21:39,080
equatorial orbit and to achieve the

424
00:21:44,140 --> 00:21:41,480
equatorial orbit you have to launch from

425
00:21:47,890 --> 00:21:44,150
very near the equator eventually the

426
00:21:49,990 --> 00:21:47,900
extent of the the tora tora lemon that

427
00:21:54,370 --> 00:21:50,000
was in king anyway then there was no

428
00:21:55,930 --> 00:21:54,380
problem these people sitting right there

429
00:22:00,159 --> 00:21:55,940
on the Indian Ocean at least in the

430
00:22:01,600 --> 00:22:00,169
early days 1967 for example I just

431
00:22:04,799 --> 00:22:01,610
wonder how many people in the world I've

432
00:22:15,600 --> 00:22:04,809
ever seen a liftoff

433
00:22:19,230 --> 00:22:15,610
their front porches this mission

434
00:22:22,289 --> 00:22:19,240
launched on March 25th 1988 is a success

435
00:22:27,899 --> 00:22:22,299
as are all seven other launches from San

436
00:22:31,169 --> 00:22:27,909
Marco aboard scout when we had that

437
00:22:32,580 --> 00:22:31,179
string of 3738 in a row it was like

438
00:22:34,980 --> 00:22:32,590

being on a winnin ball team with no

439
00:22:37,560 --> 00:22:34,990
competition I mean everybody was just

440
00:22:40,560 --> 00:22:37,570
tickled to death and and to add to the

441
00:22:41,999 --> 00:22:40,570
success ratio because we had a few bad

442
00:22:43,680 --> 00:22:42,009
ones to overcome you know but since

443
00:22:46,289 --> 00:22:43,690
research we had a real good success

444
00:22:48,629 --> 00:22:46,299
ratio and and you could actually see the

445
00:22:52,259 --> 00:22:48,639
product of your effort in improving

446
00:22:53,759 --> 00:22:52,269
scout the scout became so reliable that

447
00:22:56,249 --> 00:22:53,769
mission planners could take it for

448
00:22:58,139 --> 00:22:56,259
granted they focused on the science of

449
00:23:00,779 --> 00:22:58,149
the satellite payload rather than its

450
00:23:02,909 --> 00:23:00,789
transportation the pride that scout

451
00:23:04,859 --> 00:23:02,919
people feel about the program comes not

452
00:23:07,080 --> 00:23:04,869
only from their successful launch record

453
00:23:08,820 --> 00:23:07,090
but also from the role that Scout

454
00:23:12,720 --> 00:23:08,830
payloads have played in the advancement

455
00:23:14,909 --> 00:23:12,730
of science scout missions studied the

456
00:23:17,730 --> 00:23:14,919
Van Allen radiation belt that encircles

457
00:23:20,159 --> 00:23:17,740
the earth and scout payloads confirmed

458
00:23:23,009 --> 00:23:20,169
the existence of the first black hole in

459
00:23:24,840 --> 00:23:23,019
space early scout missions involved

460
00:23:27,600 --> 00:23:24,850
research into the problems of manned

461
00:23:29,519 --> 00:23:27,610
flight in space to determine which

462
00:23:32,279 --> 00:23:29,529
materials could best withstand the heat

463
00:23:35,970 --> 00:23:32,289

of reentry scout launched experiments as

464
00:23:37,980 --> 00:23:35,980
high as 135 miles then tilted downward

465
00:23:40,320 --> 00:23:37,990
and fired its third and fourth stages

466
00:23:42,899 --> 00:23:40,330
toward earth so they would reach speeds

467
00:23:45,539 --> 00:23:42,909
of 18,000 miles per hour through the

468
00:23:47,549 --> 00:23:45,549
upper atmosphere the output of these

469
00:23:51,379 --> 00:23:47,559
missions contributed directly to the

470
00:23:55,230 --> 00:23:51,389
later success of Mercury Gemini and

471
00:23:57,149 --> 00:23:55,240
Apollo programs the only satellite

472
00:23:59,249 --> 00:23:57,159
launched by scout to ever carrying a

473
00:24:02,970 --> 00:23:59,259
living thing was placed into orbit on

474
00:24:05,549 --> 00:24:02,980
November 9th 1970 the orbiting frog o

475
00:24:07,320 --> 00:24:05,559
tilith carrying two male bullfrogs was

476
00:24:09,810 --> 00:24:07,330
placed into orbit to investigate the

477
00:24:11,489 --> 00:24:09,820
effects of space on the inner ear to try

478
00:24:12,409 --> 00:24:11,499
to understand the causes of space

479
00:24:16,669 --> 00:24:12,419
sickness

480
00:24:19,820 --> 00:24:16,679
scout is the unsung hero of space it

481
00:24:25,210 --> 00:24:19,830
happens to be NASA's smallest launch

482
00:24:28,580 --> 00:24:25,220
vehicle and it does not receive the the

483
00:24:32,239 --> 00:24:28,590
same level of notoriety that you would

484
00:24:36,799 --> 00:24:32,249
with you know with larger with larger

485
00:24:41,830 --> 00:24:36,809
systems but over the years has proven to

486
00:24:44,810 --> 00:24:41,840
be a very reliable consistent performing

487
00:24:46,789 --> 00:24:44,820
workhorse for the agency other Scout

488
00:24:49,369 --> 00:24:46,799

missions dealt with pure research of

489
00:24:51,379 --> 00:24:49,379
outer space phenomena one mission

490
00:24:52,789 --> 00:24:51,389
carried an atomic clock five hundred

491
00:24:54,739 --> 00:24:52,799
times more accurate than any

492
00:24:57,409 --> 00:24:54,749
ground-based time measuring instrument

493
00:24:59,149 --> 00:24:57,419
this clock was compared to ground clocks

494
00:25:01,639 --> 00:24:59,159
to see if it would run faster went

495
00:25:03,499 --> 00:25:01,649
further from the Earth's gravity this

496
00:25:05,899 --> 00:25:03,509
mission confirmed Einstein's

497
00:25:09,049 --> 00:25:05,909
gravitational and relativity theories of

498
00:25:11,180 --> 00:25:09,059
seventy years earlier scout also

499
00:25:13,639 --> 00:25:11,190
launched the Navy's transit satellites

500
00:25:16,099 --> 00:25:13,649
which provide accurate navigation to the

501
00:25:23,700 --> 00:25:16,109
fleet and to over 6,000 commercial

502
00:25:29,520 --> 00:25:27,540
in the late 1970s NASA's policymakers

503
00:25:31,350 --> 00:25:29,530
decided to launch all future NASA

504
00:25:33,770 --> 00:25:31,360
satellites on the space shuttle and

505
00:25:36,930 --> 00:25:33,780
abolish all expendable launch vehicles

506
00:25:39,600 --> 00:25:36,940
but the failure of challenger in 1986

507
00:25:41,490 --> 00:25:39,610
reversed that policy while the shuttle

508
00:25:43,140 --> 00:25:41,500
was grounded it was obvious that the

509
00:25:46,650 --> 00:25:43,150
space program needed more launch

510
00:25:49,560 --> 00:25:46,660
capability in response NASA established

511
00:25:52,410 --> 00:25:49,570
the mixed fleet concept under the new

512
00:25:54,030 --> 00:25:52,420
plan NASA will obtain launch services

513
00:25:56,670 --> 00:25:54,040

from commercial firms to launch

514
00:26:00,630 --> 00:25:56,680
government payloads these directives

515
00:26:03,630 --> 00:26:00,640
mean changes for Scout the program as we

516
00:26:08,400 --> 00:26:03,640
know it is ending it essentially is what

517
00:26:11,580 --> 00:26:08,410
it means the the fact that there's so

518
00:26:13,470 --> 00:26:11,590
few vehicles left doesn't give the vote

519
00:26:16,770 --> 00:26:13,480
people and they got heard people a time

520
00:26:19,320 --> 00:26:16,780
to develop the same type of a working

521
00:26:21,240 --> 00:26:19,330
relationship as we did and then once

522
00:26:23,850 --> 00:26:21,250
those five vehicles are gone is back to

523
00:26:27,960 --> 00:26:23,860
the to the launch services concept so

524
00:26:31,580 --> 00:26:27,970
the launch vehicle business as we knew

525
00:26:34,860 --> 00:26:31,590
it is essentially ended on January 1st

526
00:26:36,570 --> 00:26:34,870
1991 Langley turned the scout program

527
00:26:37,430 --> 00:26:36,580
over to NASA's Goddard Space Flight

528
00:26:40,320 --> 00:26:37,440
Center

529
00:26:42,440 --> 00:26:40,330
LTV Corporation will continue to market

530
00:26:44,730 --> 00:26:42,450
Scout as a commercial launch vehicle

531
00:26:48,120 --> 00:26:44,740
Goddard will launch the remaining

532
00:26:50,880 --> 00:26:48,130
government-owned Rockets this salute to

533
00:26:51,180 --> 00:26:50,890
scout and Langley marks the end of an

534
00:26:57,660 --> 00:26:51,190
era

535
00:27:02,010 --> 00:26:57,670
chance to remember we all had one common

536
00:27:04,860 --> 00:27:02,020
goal a teamwork also was resolved a

537
00:27:08,690 --> 00:27:04,870
mutual respect for each other

538
00:27:12,030 --> 00:27:08,700

it wasn't an adversity bursary type

539
00:27:16,070 --> 00:27:12,040
situation where I was always not

540
00:27:19,140 --> 00:27:16,080
knocking your heads it was strictly a

541
00:27:21,540 --> 00:27:19,150
job that had to be done and done in the

542
00:27:22,680 --> 00:27:21,550
most reliable manner I don't think

543
00:27:25,770 --> 00:27:22,690
there's ever been

544
00:27:27,570 --> 00:27:25,780
another project our government and

545
00:27:32,250 --> 00:27:27,580
contractor people work together as

546
00:27:41,800 --> 00:27:35,380
partly I guess it was the nature of the

547
00:27:43,780 --> 00:27:41,810
program the the goal the the job that we

548
00:27:47,560 --> 00:27:43,790
were charged to do I mean to that it was

549
00:27:51,700 --> 00:27:47,570
to be an inexpensive rocket used by a

550
00:27:53,830 --> 00:27:51,710
lot of people it it was a goal that you

551
00:27:55,870 --> 00:27:53,840
could put your heart into there's

552
00:27:57,670 --> 00:27:55,880
something about the program you work it

553
00:28:01,390 --> 00:27:57,680
for a little while and you get involved

554
00:28:06,430 --> 00:28:01,400
in it and then when that happens you

555
00:28:09,970 --> 00:28:06,440
lose the the lines of you know whether

556
00:28:12,040 --> 00:28:09,980
your agency or whether your LTV or

557
00:28:15,610 --> 00:28:12,050
whether your Air Force you become a

558
00:28:18,370 --> 00:28:15,620
scout person Scout success rate of 96%

559
00:28:20,860 --> 00:28:18,380
has earned this workhorse a spot in the

560
00:28:22,690 --> 00:28:20,870
National Air and Space Museum where it

561
00:28:24,970 --> 00:28:22,700
stands beside other veterans of

562
00:28:29,650 --> 00:28:24,980
America's space program such as Jupiter

563
00:28:31,570 --> 00:28:29,660

aerobee and Vanguard over 700 people

564
00:28:34,870 --> 00:28:31,580
have worked on the scout program during

565
00:28:36,640 --> 00:28:34,880
the past 32 years these Scout people

566
00:28:38,440 --> 00:28:36,650
created a launch vehicle that set a

567
00:28:39,430 --> 00:28:38,450
standard for productivity and

568
00:28:41,950 --> 00:28:39,440
reliability

569
00:28:45,070 --> 00:28:41,960
they established uncompromising

570
00:28:47,770 --> 00:28:45,080
standards of exactness they set records

571
00:28:49,990 --> 00:28:47,780
for success they were unwavering in the

572
00:28:52,090 --> 00:28:50,000
pursuit of excellence and in

573
00:28:53,830 --> 00:28:52,100
accomplishing these things they created

574
00:28:56,560 --> 00:28:53,840
an atmosphere of teamwork and mutual

575
00:29:02,750 --> 00:28:56,570
respect that all of those who worked on

576
00:29:07,890 --> 00:29:05,640
the NASA space program has given us

577
00:29:10,350 --> 00:29:07,900
images that have become imprinted on the

578
00:29:14,640 --> 00:29:10,360
national consciousness as icons of