
USA

1
00:00:00,290 --> 00:00:16,840
[Music]

2
00:00:21,710 --> 00:00:19,580
America's newest entry in the program of

3
00:00:24,230 --> 00:00:21,720
the exploration of the space above our

4
00:00:26,920 --> 00:00:24,240
earth and the investigation of the

5
00:00:38,150 --> 00:00:26,930
planets of our solar system and beyond

6
00:00:39,800 --> 00:00:38,160
is the Apollo Saturn 1b with the

7
00:00:42,050 --> 00:00:39,810
successful firing of this space

8
00:00:44,270 --> 00:00:42,060
transportation system the National

9
00:00:47,180 --> 00:00:44,280
Aeronautics and Space Administration has

10
00:00:49,459 --> 00:00:47,190
added an intermediate space vehicle to

11
00:00:53,660 --> 00:00:49,469
its family of three Saturn launch

12
00:00:56,240 --> 00:00:53,670
vehicles the Apollo Saturn 1b standing

13
00:00:59,060 --> 00:00:56,250

over 20 stories high will be the first

14
00:01:01,099 --> 00:00:59,070
Saturn to be used for manned flights it

15
00:01:03,470 --> 00:01:01,109
initially will be used for practice and

16
00:01:05,119 --> 00:01:03,480
training for the manned lunar mission to

17
00:01:07,850 --> 00:01:05,129
be accomplished before the end of the

18
00:01:14,630 --> 00:01:07,860
1960's with a much larger Saturn 5

19
00:01:17,360 --> 00:01:14,640
booster the earlier Saturn the Saturn 1

20
00:01:19,610 --> 00:01:17,370
has completed its flight schedule of 10

21
00:01:23,330 --> 00:01:19,620
firings scoring and unprecedented

22
00:01:28,580 --> 00:01:23,340
success by proving 100% successful in

23
00:01:30,410 --> 00:01:28,590
all flights the Saturn 1b first stage

24
00:01:33,050 --> 00:01:30,420
while appearing to be almost identical

25
00:01:38,450 --> 00:01:33,060
to the earlier Saturn first stage is

26
00:01:40,490 --> 00:01:38,460
actually a much improved booster the

27
00:01:43,160 --> 00:01:40,500
cluster of eight engines was increased

28
00:01:47,180 --> 00:01:43,170
in power from 1.5 million pounds thrust

29
00:01:50,030 --> 00:01:47,190
to 1.6 million the weight of the booster

30
00:01:52,340 --> 00:01:50,040
was reduced by 20 thousand pounds thus

31
00:01:54,620 --> 00:01:52,350
giving the Saturn 1b a significant

32
00:01:57,170 --> 00:01:54,630
increase in performance while retaining

33
00:01:59,420 --> 00:01:57,180
the reliability factor which the smaller

34
00:02:04,370 --> 00:01:59,430
Saturn has so dramatically shown in

35
00:02:06,710 --> 00:02:04,380
actual flight the second stage of the

36
00:02:09,559 --> 00:02:06,720
Saturn 1b has more than double the power

37
00:02:12,259 --> 00:02:09,569
of the earlier Saturn second stage this

38
00:02:16,850 --> 00:02:12,269

part alone is as tall as a five-story

39
00:02:22,190 --> 00:02:16,860
building it will later be used as the

40
00:02:24,530 --> 00:02:22,200
third stage of the Saturn 5 to complete

41
00:02:26,090 --> 00:02:24,540
the space vehicle and instrument unit is

42
00:02:26,900 --> 00:02:26,100
added which contains the guidance

43
00:02:28,790 --> 00:02:26,910
equipment

44
00:02:33,650 --> 00:02:28,800
necessary to place the Saturn on its

45
00:02:35,990 --> 00:02:33,660
planned flight path above this is the

46
00:02:38,870 --> 00:02:36,000
payload a command and propulsion module

47
00:02:40,730 --> 00:02:38,880
and a lunar module the spacecraft which

48
00:02:43,550 --> 00:02:40,740
later will be boosted to the moon by the

49
00:02:48,050 --> 00:02:43,560
larger saturn v to perform the actual

50
00:02:51,290 --> 00:02:48,060
manned lunar landing the story of this

51
00:02:52,670 --> 00:02:51,300
enormous Saturn 1b began in 1962 when

52
00:02:55,310 --> 00:02:52,680
the National Aeronautics and Space

53
00:02:57,320 --> 00:02:55,320
Administration determined to test the

54
00:02:59,180 --> 00:02:57,330
complete Apollo spacecraft in Earth

55
00:03:01,460 --> 00:02:59,190
orbit as soon as possible

56
00:03:03,650 --> 00:03:01,470
this Saturn would permit manned earth

57
00:03:05,720 --> 00:03:03,660
orbital rendezvous flights to begin a

58
00:03:08,390 --> 00:03:05,730
year earlier than previously planned

59
00:03:12,740 --> 00:03:08,400
without the expense of a completely new

60
00:03:15,500 --> 00:03:12,750
development program at the Michoud

61
00:03:17,510 --> 00:03:15,510
assembly facility at new orleans the

62
00:03:18,910 --> 00:03:17,520
Chrysler Corporation under the direction

63
00:03:22,210 --> 00:03:18,920

of the Marshall Space Flight Center

64
00:03:25,130 --> 00:03:22,220
started production of the booster stage

65
00:03:26,870 --> 00:03:25,140
using fabrication and assembly equipment

66
00:03:29,710 --> 00:03:26,880
similar to that used for the earlier

67
00:03:33,040 --> 00:03:29,720
Saturn the booster began to take shape

68
00:03:37,100 --> 00:03:33,050
the cluster of tanks first was assembled

69
00:03:38,870 --> 00:03:37,110
the eight operated engines added and the

70
00:03:41,920 --> 00:03:38,880
intricate engine controls and the

71
00:03:44,750 --> 00:03:41,930
electrical network were installed with

72
00:03:46,490 --> 00:03:44,760
assembly completed details quality

73
00:03:48,430 --> 00:03:46,500
checks and tests were conducted under

74
00:03:51,280 --> 00:03:48,440
propulsion electrical control

75
00:03:54,020 --> 00:03:51,290
instrumentation and telemetry systems a

76
00:03:59,330 --> 00:03:54,030
central computer complex supported the

77
00:04:01,520 --> 00:03:59,340
operation the booster was next moved on

78
00:04:03,860 --> 00:04:01,530
its transporter to the barrage Palamon

79
00:04:06,590 --> 00:04:03,870
to start its long trip up the

80
00:04:08,300 --> 00:04:06,600
Mississippi Ohio and Tennessee rivers to

81
00:04:13,790 --> 00:04:08,310
the ground firing site at Huntsville

82
00:04:16,010 --> 00:04:13,800
Alabama in March 1965 the stage was in

83
00:04:23,360 --> 00:04:16,020
the stand at Huntsville ready for the

84
00:04:28,460 --> 00:04:26,540
it was fired first for 30 seconds then

85
00:04:32,530 --> 00:04:28,470
two weeks later fired for the full

86
00:04:35,390 --> 00:04:32,540
flight duration of two and 1/2 minutes

87
00:04:42,860 --> 00:04:35,400
engine control was tested by gambling

88
00:04:44,689 --> 00:04:42,870

the engines during firing all recorded

89
00:04:50,120 --> 00:04:44,699
results indicated the stage was ready

90
00:04:52,250 --> 00:04:50,130
for its maiden flight it was then barged

91
00:04:55,010 --> 00:04:52,260
to me shoe assembly facility for final

92
00:04:57,230 --> 00:04:55,020
checks and later to Cape Kennedy where

93
00:05:01,850 --> 00:04:57,240
the NASA Kennedy Space Center team began

94
00:05:04,610 --> 00:05:01,860
launch preparations at the same time the

95
00:05:06,320 --> 00:05:04,620
booster was being assembled the second

96
00:05:07,939 --> 00:05:06,330
stage was under fabrication at

97
00:05:09,980 --> 00:05:07,949
Huntington Beach California by the

98
00:05:14,360 --> 00:05:09,990
Douglas Aircraft Company under direction

99
00:05:17,810 --> 00:05:14,370
of the Marshall Center this completely

100
00:05:21,640 --> 00:05:17,820
new hydrogen fueled upper stage uses a

101
00:05:24,200 --> 00:05:21,650
single 200,000 pound thrust j2 engine

102
00:05:26,600 --> 00:05:24,210
among the unique features of this stage

103
00:05:28,580 --> 00:05:26,610
is the use of a common bulkhead to

104
00:05:31,850 --> 00:05:28,590
separate the liquid oxygen from the

105
00:05:34,129 --> 00:05:31,860
liquid hydrogen fuel special

106
00:05:36,260 --> 00:05:34,139
installation under bulkhead keeps the

107
00:05:38,300 --> 00:05:36,270
liquid oxygen from being frozen by the

108
00:05:45,050 --> 00:05:38,310
liquid hydrogen which has a temperature

109
00:05:46,940 --> 00:05:45,060
of 423 degrees below zero the stage was

110
00:05:51,820 --> 00:05:46,950
later moved to the Sacramento test

111
00:05:57,140 --> 00:05:54,860
full duration firing of seven and 1/2

112
00:05:59,510 --> 00:05:57,150
minutes marked the first time that a

113
00:06:02,060 --> 00:05:59,520

fully automatic system had been used to

114
00:06:04,310 --> 00:06:02,070
perform a complete check out propellant

115
00:06:07,879 --> 00:06:04,320
loading and Static firing tests on a

116
00:06:10,040 --> 00:06:07,889
space vehicle this engine was also

117
00:06:11,810 --> 00:06:10,050
programmed to gimbal in simulation of

118
00:06:16,520 --> 00:06:11,820
the guidance commands it would receive

119
00:06:18,860 --> 00:06:16,530
in actual flight after final checkout

120
00:06:20,719 --> 00:06:18,870
the stage was transported by barge from

121
00:06:28,689 --> 00:06:20,729
California to the Kennedy Space Center

122
00:06:33,380 --> 00:06:31,250
meanwhile the instrument unit the brain

123
00:06:35,209 --> 00:06:33,390
or nerve center of the Saturn vehicle

124
00:06:36,620 --> 00:06:35,219
was under joint development by the

125
00:06:37,310 --> 00:06:36,630
International business machine

126
00:06:39,050 --> 00:06:37,320
cooperation

127
00:06:42,140 --> 00:06:39,060
and the Marshall Center at Huntsville

128
00:06:44,300 --> 00:06:42,150
Alabama this unit provides the commands

129
00:06:46,130 --> 00:06:44,310
for engine gimbal lling in-flight

130
00:06:49,370 --> 00:06:46,140
sequencing of the engine propulsion

131
00:06:52,880 --> 00:06:49,380
system staging operations telemetry and

132
00:06:55,370 --> 00:06:52,890
all primary timing signals the Saturn 1b

133
00:06:57,650 --> 00:06:55,380
instrument unit is essentially the same

134
00:07:02,000 --> 00:06:57,660
instrument section which will be used on

135
00:07:04,310 --> 00:07:02,010
later saturn v launch vehicles the

136
00:07:06,470 --> 00:07:04,320
complete payload for the Saturn 1b space

137
00:07:08,810 --> 00:07:06,480
vehicle was developed by North American

138
00:07:12,040 --> 00:07:08,820

Aviation under the direction of NASA's

139
00:07:15,020 --> 00:07:12,050
manned spacecraft Center Houston Texas

140
00:07:19,250 --> 00:07:15,030
for the first Apollo Saturn 1b flight

141
00:07:22,880 --> 00:07:19,260
this consisted of the command module the

142
00:07:25,820 --> 00:07:22,890
propulsion module a weight simulating

143
00:07:30,500 --> 00:07:25,830
the lunar module and the launch escape

144
00:07:32,570 --> 00:07:30,510
system upon completion of the first

145
00:07:34,490 --> 00:07:32,580
flight payload the sections were

146
00:07:39,830 --> 00:07:34,500
transported to the launch center for

147
00:07:41,810 --> 00:07:39,840
addition to the booster before a final

148
00:07:44,510 --> 00:07:41,820
development work on both stages and the

149
00:07:47,270 --> 00:07:44,520
payload a complete non flight version of

150
00:07:49,190 --> 00:07:47,280
the full Apollo Saturn 1b vehicle had

151
00:07:52,390 --> 00:07:49,200
been placed in a two hundred four foot

152
00:07:54,980 --> 00:07:52,400
high dynamic test stand at Huntsville

153
00:07:56,510 --> 00:07:54,990
hear the full rocket was subjected to

154
00:08:00,620 --> 00:07:56,520
shake tests for determining its

155
00:08:02,420 --> 00:08:00,630
vibration and bending characteristics in

156
00:08:04,040 --> 00:08:02,430
keeping with the new NASA policy of

157
00:08:05,870 --> 00:08:04,050
flying complete Saturn vehicles

158
00:08:07,550 --> 00:08:05,880
beginning with the first flight the

159
00:08:10,580 --> 00:08:07,560
vehicle we have seen under development

160
00:08:12,530 --> 00:08:10,590
was planned to follow this concept both

161
00:08:15,530 --> 00:08:12,540
stages and the instrument unit were

162
00:08:17,720 --> 00:08:15,540
scheduled for a full test in flight the

163
00:08:19,730 --> 00:08:17,730

command module was complete except for

164
00:08:21,710 --> 00:08:19,740
the life-support system and the

165
00:08:25,730 --> 00:08:21,720
propulsion module was set to fire its

166
00:08:27,800 --> 00:08:25,740
propulsion and guidance system this

167
00:08:30,500 --> 00:08:27,810
first launch vehicle was programmed to

168
00:08:32,659 --> 00:08:30,510
perform a sub orbital lob shot with the

169
00:08:35,360 --> 00:08:32,669
Apollo command and propulsion modules as

170
00:08:38,120 --> 00:08:35,370
the payload they were to be lofted to an

171
00:08:42,260 --> 00:08:38,130
altitude of approximately 300 miles by

172
00:08:45,140 --> 00:08:42,270
the two booster stages after the first

173
00:08:46,850 --> 00:08:45,150
stage burns and drops away the second

174
00:08:49,850 --> 00:08:46,860
stage burns for seven and one-half

175
00:08:51,199 --> 00:08:49,860
minutes then its attitude controls tilt

176
00:08:59,059 --> 00:08:51,209
the payload to the proper

177
00:09:00,710 --> 00:08:59,069
re-entry position this stage is kicked

178
00:09:03,319 --> 00:09:00,720
aside and the command and propulsion

179
00:09:07,939 --> 00:09:03,329
modules Coast over the apex of the

180
00:09:09,739 --> 00:09:07,949
flight path small Rockets fire to seat

181
00:09:11,809 --> 00:09:09,749
the liquid propellants and the

182
00:09:17,569 --> 00:09:11,819
propulsion module engine ignites to

183
00:09:19,549 --> 00:09:17,579
increase the re-entry speed the engine

184
00:09:21,619 --> 00:09:19,559
reignites to check the restart

185
00:09:25,669 --> 00:09:21,629
capability and further increase the

186
00:09:28,730 --> 00:09:25,679
speed attitude rockets then turn the

187
00:09:30,710 --> 00:09:28,740
command module for re-entry the

188
00:09:32,660 --> 00:09:30,720

propulsion module is kicked aside and

189
00:09:35,900 --> 00:09:32,670
the Apollo continues toward the thicker

190
00:09:40,790 --> 00:09:35,910
air at a speed of nearly 18,000 miles an

191
00:09:43,160 --> 00:09:40,800
hour this mission was planned to provide

192
00:09:46,100 --> 00:09:43,170
a major test of the Apollo heat shield

193
00:09:47,780 --> 00:09:46,110
at a high re-entry heating rate and to

194
00:09:49,970 --> 00:09:47,790
demonstrate the operation of the

195
00:09:52,069 --> 00:09:49,980
propulsion module system and other

196
00:09:58,369 --> 00:09:52,079
spacecraft functions including the

197
00:10:02,929 --> 00:09:58,379
recovery system the cover of the Apollo

198
00:10:05,480 --> 00:10:02,939
separates and the main parachutes open

199
00:10:07,249 --> 00:10:05,490
at 2 miles above the water to land the

200
00:10:12,289 --> 00:10:07,259
test payload in the ocean without

201
00:10:14,629 --> 00:10:12,299
damaged Navy ships stood ready in the

202
00:10:16,960 --> 00:10:14,639
recovery area with equipment to raise

203
00:10:19,999 --> 00:10:16,970
the capsule aboard ship for the return

204
00:10:23,900 --> 00:10:20,009
later tests would evaluate the success

205
00:10:25,369 --> 00:10:23,910
of the reentry maneuver to motion

206
00:10:28,220 --> 00:10:25,379
picture cameras were prepared for

207
00:10:30,379 --> 00:10:28,230
installation on the saturn 1st stage to

208
00:10:32,449 --> 00:10:30,389
provide a permanent visual record of the

209
00:10:35,030 --> 00:10:32,459
separation sequence of the second stage

210
00:10:37,220 --> 00:10:35,040
from the first stage in flight they were

211
00:10:41,179 --> 00:10:37,230
also set to show the operation of the

212
00:10:43,039 --> 00:10:41,189
liquid hydrogen fueled engine the

213
00:10:45,499 --> 00:10:43,049

cameras were attached to the first stage

214
00:10:51,139 --> 00:10:45,509
and a system was installed to eject them

215
00:10:53,600 --> 00:10:51,149
at the appropriate time soon after

216
00:10:55,579 --> 00:10:53,610
ejection spring-loaded flaps open to

217
00:10:58,009 --> 00:10:55,589
stabilize the cameras and to slow their

218
00:11:02,749 --> 00:10:58,019
descent they reacted the atmosphere at

219
00:11:05,120 --> 00:11:02,759
79 hundred miles an hour three miles

220
00:11:08,570 --> 00:11:05,130
above the ocean a parable hoon Phil

221
00:11:10,220 --> 00:11:08,580
with gas to expand the balloon the

222
00:11:12,320 --> 00:11:10,230
attached parachute and the balloon

223
00:11:14,510 --> 00:11:12,330
produced drag to reduce the capsule

224
00:11:20,180 --> 00:11:14,520
impact velocity to prevent capsule

225
00:11:22,580 --> 00:11:20,190
damage the parable hoon also serves as a

226
00:11:25,370 --> 00:11:22,590
location aid and floats the camera in

227
00:11:27,800 --> 00:11:25,380
the ocean upon contact with the water a

228
00:11:30,500 --> 00:11:27,810
fluorescent dye is released to aid

229
00:11:32,660 --> 00:11:30,510
recovery a shark repellent is also

230
00:11:34,790 --> 00:11:32,670
released to ward off marine life that

231
00:11:38,990 --> 00:11:34,800
could damage the capsule and para

232
00:11:40,760 --> 00:11:39,000
balloon float a radio beacon attached to

233
00:11:42,920 --> 00:11:40,770
the top of the Faribault loon transmits

234
00:11:45,230 --> 00:11:42,930
a signal to aid recovery planes and

235
00:11:48,760 --> 00:11:45,240
ships in the area the film would be

236
00:11:53,210 --> 00:11:48,770
returns to huntsville alabama for study

237
00:11:55,400 --> 00:11:53,220
as the firing time approached 190,000

238
00:11:58,160 --> 00:11:55,410

gallons of liquid oxygen liquid hydrogen

239
00:12:00,500 --> 00:11:58,170
and kerosene were poured into the tanks

240
00:12:05,450 --> 00:12:00,510
the countdown proceeded to at the moment

241
00:12:07,940 --> 00:12:05,460
of ignition the firing team made final

242
00:12:09,620 --> 00:12:07,950
checks and evaluations a successful

243
00:12:12,200 --> 00:12:09,630
firing would mean that the United States

244
00:12:15,500 --> 00:12:12,210
Apollo Saturn program for the conquest

245
00:12:23,960 --> 00:12:15,510
of the moon and Beyond was proceeding as

246
00:12:31,010 --> 00:12:23,970
planned five four three two one ignition

247
00:12:33,020 --> 00:12:31,020
the Apollo Saturn 1b lifted slowly at

248
00:13:07,670 --> 00:12:33,030
first then doubled and redoubled its

249
00:13:12,920 --> 00:13:10,569
the first stage completed its mission

250
00:13:15,019 --> 00:13:12,930
the on-board camera showed the

251
00:13:18,379 --> 00:13:15,029
successful separation of the first stage

252
00:13:20,210 --> 00:13:18,389
the burn of the small solid rockets to

253
00:13:27,460 --> 00:13:20,220
seat the liquid propellant in the second

254
00:13:31,400 --> 00:13:29,419
telemetered information to ground

255
00:13:33,669 --> 00:13:31,410
stations revealed the success of the

256
00:13:37,369 --> 00:13:33,679
second stage and the propulsion module

257
00:13:41,509 --> 00:13:37,379
the Apollo Saturn 1b had performed its

258
00:13:42,769 --> 00:13:41,519
planned mission with this success the

259
00:13:45,019 --> 00:13:42,779
National Aeronautics and Space