1
00:00:00,720 --> 00:00:17,500
[Music]

2
00:00:23,570 --> 00:00:20,240
Saturn five film report number twenty

3
00:00:28,099 --> 00:00:23,580
covers progress area December first 1967

4
00:00:29,570 --> 00:00:28,109
through February 29th 1968 at the

5
00:00:31,939 --> 00:00:29,580
beginning of the quarter the second

6
00:00:33,709 --> 00:00:31,949
Saturn 5 flight vehicle stood fully

7
00:00:36,110 --> 00:00:33,719
erected in the Kennedy Space Center's

8
00:00:37,880 --> 00:00:36,120
Vehicle Assembly Building with checkout

9
00:00:38,630 --> 00:00:37,890
underway for a scheduled launch next

10
00:00:41,569 --> 00:00:38,640
quarter

11
00:00:42,950 --> 00:00:41,579
check out of the AS 502 which was

12
00:00:45,410 --> 00:00:42,960
developed under direction of the

13
00:00:47,779 --> 00:00:45,420

Marshall Space Flight Center proceeded

14
00:00:51,139 --> 00:00:47,789
throughout December in January with no

15
00:00:53,660 --> 00:00:51,149
major problems encountered AAS 502 will

16
00:00:56,119 --> 00:00:53,670
serve as launch vehicle for the Apollo 6

17
00:01:00,220 --> 00:00:56,129
mission an unmanned flight to qualify

18
00:01:03,290 --> 00:01:00,230
the Saturn 5 for future manned flights

19
00:01:05,149 --> 00:01:03,300
roll out of the 36 story tall space

20
00:01:08,660 --> 00:01:05,159
vehicle from the Assembly Building to

21
00:01:10,130 --> 00:01:08,670
pad a of launch complex 39 was

22
00:01:13,550 --> 00:01:10,140
accomplished without incident on

23
00:01:15,620 --> 00:01:13,560
February 6th the rollout operation the

24
00:01:18,410 --> 00:01:15,630
three-mile movement requiring some seven

25
00:01:20,570 --> 00:01:18,420
hours twice a s 502 in the launch

26
00:01:23,630 --> 00:01:20,580
position from which its predecessor a s

27
00:01:27,440 --> 00:01:23,640
501 began its successful flight last

28
00:01:30,039 --> 00:01:27,450
November 9th the 502 mission will be

29
00:01:31,999 --> 00:01:30,049
essentially the same as that of the 501

30
00:01:35,420 --> 00:01:32,009
evaluation of launch vehicle and

31
00:01:37,219 --> 00:01:35,430
spacecraft performance a s 502 will

32
00:01:39,770 --> 00:01:37,229
carry several minor modifications

33
00:01:42,109 --> 00:01:39,780
directed by the Marshall Center as a

34
00:01:46,550 --> 00:01:42,119
result of data provided by the initial

35
00:01:48,499 --> 00:01:46,560
launch final updated versions of both

36
00:01:50,060 --> 00:01:48,509
the flight and ground program tapes for

37
00:01:52,880 --> 00:01:50,070
the computerized countdown and launch

38
00:01:57,499 --> 00:01:52,890

were delivered to KSC by the Marshall

39
00:02:00,050 --> 00:01:57,509
Center in early February during the

40
00:02:03,080 --> 00:02:00,060
10-hour earth orbital Apollo 6 mission a

41
00:02:05,330 --> 00:02:03,090
five and a half minute s4b stage second

42
00:02:08,089 --> 00:02:05,340
burn will duplicate that of an actual

43
00:02:10,910 --> 00:02:08,099
lunar mission however the Apollo

44
00:02:13,850 --> 00:02:10,920
spacecraft after separation from the s4b

45
00:02:16,850 --> 00:02:13,860
stage will be limited to an Apogee

46
00:02:19,840 --> 00:02:16,860
12,000 nautical miles by a 4-minute

47
00:02:22,670 --> 00:02:19,850
braking burn of its propulsion system

48
00:02:24,710 --> 00:02:22,680
from its Apogee the spacecraft will

49
00:02:26,870 --> 00:02:24,720
simulate lunar mission return flight

50
00:02:30,590 --> 00:02:26,880
maneuvers including a high-speed

51
00:02:33,800 --> 00:02:30,600
re-entry into Earth's atmosphere the s4b

52
00:02:37,040 --> 00:02:33,810
stage will travel about 270 9,000 miles

53
00:02:40,430 --> 00:02:37,050
into space on a 16 day elliptical Earth

54
00:02:43,310 --> 00:02:40,440
orbit due to the moon's position at 5:02

55
00:02:48,470 --> 00:02:43,320
launch the stage will not actually swing

56
00:02:51,680 --> 00:02:48,480
around the moon as a s5o - moved closer

57
00:02:54,680 --> 00:02:51,690
to its launch date all elements of the

58
00:02:57,290 --> 00:02:54,690
third Saturn 5 flight vehicle a s 503

59
00:03:00,880 --> 00:02:57,300
were delivered to KSC from the prime

60
00:03:05,030 --> 00:03:00,890
contractors the vehicles first stage s1

61
00:03:10,580 --> 00:03:05,040
c3 arrived December 27 from Boeing the

62
00:03:12,970 --> 00:03:10,590
shoe in New Orleans the second stage s2

63
00:03:15,590 --> 00:03:12,980

3 was received on December 24th

64
00:03:18,680 --> 00:03:15,600
following acceptance firing at Marshalls

65
00:03:20,300 --> 00:03:18,690
Mississippi test facility the stage was

66
00:03:23,170 --> 00:03:20,310
built for North American rock wall at

67
00:03:27,380 --> 00:03:23,180
seal Beach California

68
00:03:29,600 --> 00:03:27,390
the third stage s for B 503 arrived by

69
00:03:32,030 --> 00:03:29,610
super guppy aircraft on December 30th

70
00:03:36,140 --> 00:03:32,040
from the McDonnell Douglas Sacramento

71
00:03:37,910 --> 00:03:36,150
Test Site in California the instrument

72
00:03:40,910 --> 00:03:37,920
unit for the third Saturn 5 flight

73
00:03:43,610 --> 00:03:40,920
vehicle was delivered to KSC on January

74
00:03:48,770 --> 00:03:43,620
4th by super guppy from the contractor

75
00:03:51,259 --> 00:03:48,780
IBM Huntsville after inspection and

76
00:03:53,360 --> 00:03:51,269
check-out of the stages an IU stacking

77
00:03:55,370 --> 00:03:53,370
of the a s 503 in the Vehicle Assembly

78
00:03:58,580 --> 00:03:55,380
Building was accomplished by the 1st of

79
00:04:01,039 --> 00:03:58,590
February topped by a mock-up of the

80
00:04:03,170 --> 00:04:01,049
Apollo spacecraft the vehicle will

81
00:04:04,970 --> 00:04:03,180
undergo extensive checkout before being

82
00:04:08,240 --> 00:04:04,980
pronounced ready for flight scheduled

83
00:04:09,410 --> 00:04:08,250
later this year the dummy spacecraft

84
00:04:12,199 --> 00:04:09,420
structure built by North American

85
00:04:15,080 --> 00:04:12,209
Rockwell was modified and prepared for

86
00:04:17,539 --> 00:04:15,090
flight use by the Marshall Center the

87
00:04:20,630 --> 00:04:17,549
boilerplate structure designated BP 30

88
00:04:23,540 --> 00:04:20,640

will be ballasted 289 thousand pounds

89
00:04:25,460 --> 00:04:23,550
for the 503 flight since the manned

90
00:04:27,560 --> 00:04:25,470
spacecraft Center in Houston has no

91
00:04:30,860 --> 00:04:27,570
mission requirements for the young man a

92
00:04:33,050 --> 00:04:30,870
5:03 BP 35 Marshall will have

93
00:04:38,300 --> 00:04:33,060
responsibility for the entire space

94
00:04:40,640 --> 00:04:38,310
vehicle s1c for the first stage for the

95
00:04:42,590 --> 00:04:40,650
fourth Saturn five flight vehicle was

96
00:04:44,390 --> 00:04:42,600
moved in late December from storage in

97
00:04:47,180 --> 00:04:44,400
the manufacturing building at Boeing the

98
00:04:49,580 --> 00:04:47,190
shoo-in to test cell number one of the

99
00:04:52,430 --> 00:04:49,590
stage test building for incorporation of

100
00:04:57,860 --> 00:04:52,440
modifications delivery of the stage to

101
00:04:59,420 --> 00:04:57,870
KSC is due in late April the first stage

102
00:05:01,790 --> 00:04:59,430
for the fifth flight vehicle is in

103
00:05:05,020 --> 00:05:01,800
storage at Boeing masu with delivery to

104
00:05:07,970 --> 00:05:05,030
KSC slated for June

105
00:05:10,370 --> 00:05:07,980
the second rs to stage four the fourth

106
00:05:13,370 --> 00:05:10,380
flight vehicle was successfully captive

107
00:05:15,500 --> 00:05:13,380
fired at MTF on February 10th for its

108
00:05:18,230 --> 00:05:15,510
full duration of six minutes to meet

109
00:05:20,810 --> 00:05:18,240
acceptance test requirements an earlier

110
00:05:24,050 --> 00:05:20,820
attempt on January 30th had been

111
00:05:25,030 --> 00:05:24,060
terminated 17 seconds after ignition due

112
00:05:27,020 --> 00:05:25,040
to a ground support equipment

113
00:05:29,210 --> 00:05:27,030

malfunction and the Delta P tank

114
00:05:30,740 --> 00:05:29,220
measurements which resulted in venting

115
00:05:34,330 --> 00:05:30,750
of the liquid oxygen and liquid hydrogen

116
00:05:37,130 --> 00:05:34,340
tanks following the successful firing

117
00:05:43,070 --> 00:05:37,140
s24 is being readied for shipment to KSC

118
00:05:45,500 --> 00:05:43,080
in late april during dye penetrant tests

119
00:05:47,380 --> 00:05:45,510
an x-ray inspection of the s2 stage for

120
00:05:49,700 --> 00:05:47,390
the fifth flight vehicle at Seal Beach

121
00:05:51,800 --> 00:05:49,710
hairline cracks were discovered in the

122
00:05:54,860 --> 00:05:51,810
liquid hydrogen tank circumferential

123
00:05:58,310 --> 00:05:54,870
weld the defective area was grooved out

124
00:06:00,080 --> 00:05:58,320
and REE welded after rigidly inspection

125
00:06:02,360 --> 00:06:00,090
using double angle x-ray and dye

126
00:06:05,180 --> 00:06:02,370
penetrant tests the stage was shipped in

127
00:06:09,080 --> 00:06:05,190
mid-february to MTF for acceptance

128
00:06:11,480 --> 00:06:09,090
firing next quarter the s2 2 stage was

129
00:06:14,990 --> 00:06:11,490
also Rhian spected at KSC prior to

130
00:06:18,410 --> 00:06:15,000
stacking and s 2 3 & 4 were rien spected

131
00:06:22,100 --> 00:06:18,420
at MTF when hairline weld flaws were

132
00:06:23,840 --> 00:06:22,110
also found in the s2 7 stage a decision

133
00:06:27,050 --> 00:06:23,850
was made to initiate an additional

134
00:06:30,740 --> 00:06:27,060
inspection procedure cryogenic proof

135
00:06:34,130 --> 00:06:30,750
testing on all man rated stages starting

136
00:06:37,040 --> 00:06:34,140
with s2 4 however depending on the

137
00:06:39,170 --> 00:06:37,050
success of the as50 to launch if NASA

138
00:06:41,460 --> 00:06:39,180

decides to fly the third vehicle manned

139
00:06:43,860 --> 00:06:41,470
the s2 3 will be unn

140
00:06:46,290 --> 00:06:43,870
sacked and sent back to MTF for the new

141
00:06:50,790 --> 00:06:46,300
test which consists of proof pressure

142
00:06:52,230 --> 00:06:50,800
testing at cryogenic temperatures the

143
00:06:55,590 --> 00:06:52,240
third stage for the fourth flight

144
00:06:57,930 --> 00:06:55,600
vehicle s for B 504 was removed from

145
00:07:00,330 --> 00:06:57,940
storage in early January and installed

146
00:07:02,580 --> 00:07:00,340
in the beta one test stand at SAC tow

147
00:07:04,950 --> 00:07:02,590
for deferred post static checkout which

148
00:07:10,380 --> 00:07:04,960
is now underway the stage will be

149
00:07:13,050 --> 00:07:10,390
delivered to KSC in late April s for B

150
00:07:15,840 --> 00:07:13,060
505 underwent insulation rework in the

151
00:07:17,700 --> 00:07:15,850
vehicle checkout lab at SAC DOE and was

152
00:07:19,560 --> 00:07:17,710
returned to storage after completion of

153
00:07:21,960 --> 00:07:19,570
liquid hydrogen tank inspection in

154
00:07:23,820 --> 00:07:21,970
mid-february the stage will undergo

155
00:07:26,460 --> 00:07:23,830
deferred post static checkout and

156
00:07:31,350 --> 00:07:26,470
modifications in March with delivery to

157
00:07:33,090 --> 00:07:31,360
KSC set for late June the instrument

158
00:07:35,220 --> 00:07:33,100
unit for the fourth flight vehicle was

159
00:07:38,520 --> 00:07:35,230
removed from storage at IBM Huntsville

160
00:07:40,940 --> 00:07:38,530
in early January for retest necessary

161
00:07:43,470 --> 00:07:40,950
after incorporation of modifications

162
00:07:46,260 --> 00:07:43,480
retest was successfully completed in

163
00:07:48,780 --> 00:07:46,270

late January and the IU is in temporary

164
00:07:53,220 --> 00:07:48,790
storage awaiting shipment to KSC in

165
00:07:54,690 --> 00:07:53,230
April component assembly on the

166
00:07:57,060 --> 00:07:54,700
instrument unit for the fifth flight

167
00:07:59,870 --> 00:07:57,070
vehicle began at IBM Huntsville in early

168
00:08:03,719 --> 00:07:59,880
January and was finished by mid February

169
00:08:04,620 --> 00:08:03,729
following checkout delivery of SIU 5:05

170
00:08:09,390 --> 00:08:04,630
to KSC

171
00:08:11,580 --> 00:08:09,400
is scheduled in late June stages and

172
00:08:13,560 --> 00:08:11,590
instrument units for subsequent saturn v

173
00:08:15,930 --> 00:08:13,570
flight vehicles continue in various

174
00:08:18,180 --> 00:08:15,940
phases of fabrication assembly check out

175
00:08:20,610 --> 00:08:18,190
and testing at contractor facilities and

176
00:08:22,500 --> 00:08:20,620
even though the initial flight test of a

177
00:08:24,990 --> 00:08:22,510
saturn v vehicle last quarter was

178
00:08:26,909 --> 00:08:25,000
successful research and development type

179
00:08:29,460 --> 00:08:26,919
tests and investigations are a

180
00:08:31,530 --> 00:08:29,470
continuing necessity to help ensure that

181
00:08:33,779 --> 00:08:31,540
all possible engineering improvements

182
00:08:38,520 --> 00:08:33,789
will be discovered and incorporated in

183
00:08:40,020 --> 00:08:38,530
future vehicles in December a Thor

184
00:08:42,209 --> 00:08:40,030
missile fuel tank which had been

185
00:08:44,970 --> 00:08:42,219
insulated with a spray on foam intended

186
00:08:47,460 --> 00:08:44,980
for use on s2 stages was installed at

187
00:08:50,520 --> 00:08:47,470
the Sacramento Test Site in preparation

188
00:08:52,650 --> 00:08:50,530

for cryogenic tanking tests McDonnell

189
00:08:54,360 --> 00:08:52,660
Douglas has been contracted by NASA to

190
00:08:56,490 --> 00:08:54,370
conduct the test program

191
00:08:59,760 --> 00:08:56,500
for North American Rockwell builders of

192
00:09:01,740 --> 00:08:59,770
the s2 stage purpose of these tests is

193
00:09:04,110 --> 00:09:01,750
to evaluate the new type insulation

194
00:09:06,930 --> 00:09:04,120
material and to verify new insulation

195
00:09:08,490 --> 00:09:06,940
field repair techniques although some

196
00:09:10,769 --> 00:09:08,500
delays have been encountered due to bad

197
00:09:15,480 --> 00:09:10,779
weather testing is expected to be

198
00:09:17,370 --> 00:09:15,490
completed in March a three-part s2

199
00:09:19,710 --> 00:09:17,380
lightweight structure will test program

200
00:09:22,769 --> 00:09:19,720
for major stage segments is underway at

201
00:09:25,230 --> 00:09:22,779
Marshall and Santa Susana California the

202
00:09:27,570 --> 00:09:25,240
a structure made up of s2 for type LOX

203
00:09:30,320 --> 00:09:27,580
tank at skirt and cylinders one and two

204
00:09:33,660 --> 00:09:30,330
is undergoing systems installation than

205
00:09:37,019 --> 00:09:33,670
instrumentation at MSFC in preparation

206
00:09:38,760 --> 00:09:37,029
for structural testing next quarter s2 4

207
00:09:41,640 --> 00:09:38,770
is the first of the lightweight stages

208
00:09:44,370 --> 00:09:41,650
due to thinner propellant tank walls and

209
00:09:46,230 --> 00:09:44,380
lighter structures s2 4 types stages

210
00:09:48,870 --> 00:09:46,240
will weigh about 3,000 pounds less than

211
00:09:51,329 --> 00:09:48,880
earlier stages allowing a comparable

212
00:09:56,880 --> 00:09:51,339
increase in Saturn 5 vehicle payload

213
00:09:58,769 --> 00:09:56,890

capability a new 64 foot tall structural

214
00:10:00,900 --> 00:09:58,779
test tower is under construction at

215
00:10:03,510 --> 00:10:00,910
Marshall for use in testing da structure

216
00:10:07,410 --> 00:10:03,520
the stand is expected to be finished and

217
00:10:09,900 --> 00:10:07,420
ready for operation and April the B

218
00:10:12,060 --> 00:10:09,910
structure consisting of s 2 4 type upper

219
00:10:14,579 --> 00:10:12,070
tank section forward dome and forward

220
00:10:16,980 --> 00:10:14,589
skirt is now undergoing structural

221
00:10:21,540 --> 00:10:16,990
testing at Santa Susana with result

222
00:10:23,850 --> 00:10:21,550
still incomplete testing of the C

223
00:10:26,310 --> 00:10:23,860
structure which includes s2 for type F

224
00:10:29,040 --> 00:10:26,320
skirt thrust cone and center engine beam

225
00:10:31,170 --> 00:10:29,050
is in progress in the load test tower at

226
00:10:34,410 --> 00:10:31,180
Marshall and will continue during the

227
00:10:36,510 --> 00:10:34,420
next report period all phases of the s2

228
00:10:41,060 --> 00:10:36,520
lightweight structural test program are

229
00:10:44,460 --> 00:10:41,070
expected to be completed in September a

230
00:10:46,019 --> 00:10:44,470
series of j2 engine tests now being held

231
00:10:48,810 --> 00:10:46,029
at the Arnold engineering development

232
00:10:51,570 --> 00:10:48,820
center Intelli home Tennessee has two

233
00:10:53,340 --> 00:10:51,580
primary objectives establishment of the

234
00:10:55,260 --> 00:10:53,350
lower bounds for fuel pump Inlet

235
00:10:58,440 --> 00:10:55,270
pressure on the engine in the s2 stage

236
00:11:00,750 --> 00:10:58,450
configuration and verification of the j2

237
00:11:03,870 --> 00:11:00,760
s capability to restart satisfactorily

238
00:11:06,150 --> 00:11:03,880

after an s4 b stage orbital Coast period

239
00:11:07,590 --> 00:11:06,160
of 80 minutes instead of 90 minutes as

240
00:11:09,930 --> 00:11:07,600
presently programmed

241
00:11:12,330 --> 00:11:09,940
test results to date have been positive

242
00:11:17,460 --> 00:11:12,340
but a second engine sample is scheduled

243
00:11:19,620 --> 00:11:17,470
to fully verify these conclusions with

244
00:11:21,870 --> 00:11:19,630
the second Saturn 5 flight vehicle now

245
00:11:23,870 --> 00:11:21,880
on the launch pad the third flight

246
00:11:25,950 --> 00:11:23,880
vehicle erected and in check-out and

247
00:11:28,650 --> 00:11:25,960
assembly and testing of subsequent

248
00:11:30,720 --> 00:11:28,660
vehicles well underway this report

249
00:11:33,480 --> 00:11:30,730
period witnessed continuing progress