1
00:00:13,820 --> 00:00:11,480
Saturn one 1b quarterly film reports

2
00:00:41,740 --> 00:00:13,830
number 20 covers progress during the

3
00:00:44,540 --> 00:00:41,750
period April May and June 1964 a

4
00:00:46,310 --> 00:00:44,550
highlight of this report period was the

5
00:00:49,340 --> 00:00:46,320
launch of the sixth Saturn flight

6
00:00:51,680 --> 00:00:49,350
vehicle si6 this vehicle was the first

7
00:00:54,319 --> 00:00:51,690
to carry an Apollo spacecraft boiler

8
00:00:57,380 --> 00:00:54,329
plate and launch escape system it was

9
00:01:00,200 --> 00:00:57,390
also the first flight to use an st 124

10
00:01:02,840 --> 00:01:00,210
for active guidance DSA six launch

11
00:01:05,420 --> 00:01:02,850
scheduled for May 26th were scrubbed

12
00:01:07,760 --> 00:01:05,430
during countdown due to an environmental

13
00:01:11,990 --> 00:01:07,770

control system compressor malfunction in

14
00:01:14,660 --> 00:01:12,000
the ground facilities equipment two days

15
00:01:17,270 --> 00:01:14,670
later the final countdown began at t

16
00:01:20,210 --> 00:01:17,280
minus 85 minutes a hold was caused by

17
00:01:22,910 --> 00:01:20,220
additional time required for st 124

18
00:01:25,789 --> 00:01:22,920
stabilizer azmuth alignment at t minus

19
00:01:28,100 --> 00:01:25,799
70 minutes a second hold was called due

20
00:01:32,179 --> 00:01:28,110
to a ground facilities valve freezing in

21
00:01:35,420 --> 00:01:32,189
the open position at t minus 41 seconds

22
00:01:38,149 --> 00:01:35,430
a third hold was called because st 124

23
00:01:40,130 --> 00:01:38,159
alignment could not be verified due to

24
00:01:43,249 --> 00:01:40,140
LOX boil off vapor breaking the

25
00:01:45,740 --> 00:01:43,259
theodolite beam the MOSFET line has been

26
00:01:47,480 --> 00:01:45,750
rerouted to a lower level eliminating

27
00:01:53,030 --> 00:01:47,490
the possibility of this condition during

28
00:01:59,209 --> 00:01:53,040
future countdowns the count was recycled

29
00:02:04,760 --> 00:01:59,219
to t-minus 15 minutes at 12:07 p.m. on

30
00:02:04,770 --> 00:02:12,900
[Music]

31
00:02:18,640 --> 00:02:15,850
the performance was as expected for the

32
00:02:20,680 --> 00:02:18,650
first 100 17 seconds of flight at that

33
00:02:22,480 --> 00:02:20,690
time booster engine number 8 shut down

34
00:02:25,570 --> 00:02:22,490
due to a mechanical failure in the

35
00:02:27,520 --> 00:02:25,580
propellant turbopup gearbox sa-7 and

36
00:02:29,770 --> 00:02:27,530
subsequent vehicles will incorporate an

37
00:02:32,140 --> 00:02:29,780
improved propellant turbo pump gearbox

38
00:02:34,060 --> 00:02:32,150

the engine out circuit shut down the

39
00:02:36,400 --> 00:02:34,070
faulty engine and the remaining seven

40
00:02:38,110 --> 00:02:36,410
engines continue to function burning two

41
00:02:40,450 --> 00:02:38,120
and seven ten seconds longer than

42
00:02:42,970 --> 00:02:40,460
programmed partially compensating for

43
00:02:45,010 --> 00:02:42,980
the loss of engine eight the deviation

44
00:02:48,310 --> 00:02:45,020
from the programmed trajectory was

45
00:02:50,800 --> 00:02:48,320
compensated for by the st 124 guidance

46
00:02:53,230 --> 00:02:50,810
system which became active shortly after

47
00:02:56,410 --> 00:02:53,240
second stage ignition prior to this time

48
00:02:58,720 --> 00:02:56,420
an ST 90s stabilized platform system

49
00:03:01,600 --> 00:02:58,730
guided the vehicle starting with the

50
00:03:05,380 --> 00:03:01,610
next flight vehicle only the st 124 will

51
00:03:07,750 --> 00:03:05,390
be used for guidance final booster

52
00:03:10,150 --> 00:03:07,760
cut-off occurred 149 seconds after

53
00:03:13,570 --> 00:03:10,160
liftoff ullage and retro rocket action

54
00:03:15,580 --> 00:03:13,580
was as expected the plight of si6 was

55
00:03:17,710 --> 00:03:15,590
recorded by the standard ground cameras

56
00:03:19,630 --> 00:03:17,720
two television cameras plus eight

57
00:03:21,940 --> 00:03:19,640
onboard movie cameras which you see

58
00:03:23,979 --> 00:03:21,950
returning to Earth these cameras were

59
00:03:28,800 --> 00:03:23,989
successful in recording flight data such

60
00:03:32,979 --> 00:03:28,810
as aerodynamic effect on blowout panels

61
00:03:37,000 --> 00:03:32,989
opening up the blowout panels rocks

62
00:03:42,460 --> 00:03:37,010
sloshing in the center LOX tank s4

63
00:03:44,110 --> 00:03:42,470

engine chill down stage separation s4

64
00:03:46,420 --> 00:03:44,120
stage ignition and performance were

65
00:03:48,520 --> 00:03:46,430
successful placing the SI six satellite

66
00:03:50,920 --> 00:03:48,530
consisting of the emptied s for stage

67
00:03:53,410 --> 00:03:50,930
instrument unit and Apollo boilerplate

68
00:03:55,840 --> 00:03:53,420
into an earth orbit lasting three and

69
00:03:58,479 --> 00:03:55,850
3/10 days as a result of good

70
00:04:01,150 --> 00:03:58,489
performance for their say 5 and si 6 s

71
00:04:03,460 --> 00:04:01,160
for stage helium heater backup hardware

72
00:04:08,259 --> 00:04:03,470
and excess fuel will be eliminated from

73
00:04:10,870 --> 00:04:08,269
future vehicles saving 1500 pounds on

74
00:04:13,180 --> 00:04:10,880
May 28 the booster and instrument unit

75
00:04:15,370 --> 00:04:13,190
for the seventh flight vehicle si 7

76
00:04:17,260 --> 00:04:15,380
departed the Marshall Center aboard the

77
00:04:20,380 --> 00:04:17,270
barge promised and arrived at Cape

78
00:04:22,190 --> 00:04:20,390
Kennedy ten days later on June night the

79
00:04:26,630 --> 00:04:22,200
booster s17

80
00:04:27,830 --> 00:04:26,640
was erected at launch complex 37b also

81
00:04:29,870 --> 00:04:27,840
by the night of June

82
00:04:31,760 --> 00:04:29,880
both the Apollo service module and the

83
00:04:35,000 --> 00:04:31,770
command module had arrived at the Cape

84
00:04:37,010 --> 00:04:35,010
by air from the West Coast following a

85
00:04:38,720 --> 00:04:37,020
successful accept inspiring and final

86
00:04:41,270 --> 00:04:38,730
checkout earlier in the quarter the

87
00:04:44,350 --> 00:04:41,280
second stage s for seven was flown from

88
00:04:46,610 --> 00:04:44,360

sacto to the Cape arriving on June 12th

89
00:04:48,770 --> 00:04:46,620
receiving inspection and preliminary

90
00:04:50,690 --> 00:04:48,780
checks on the stage were completed and

91
00:04:55,190 --> 00:04:50,700
the stage was erected at the launch

92
00:04:58,760 --> 00:04:55,200
complex on June 19th four days later on

93
00:05:01,070 --> 00:04:58,770
June 23rd the instrument unit s iu7

94
00:05:03,560 --> 00:05:01,080
was also moved to the launch complex and

95
00:05:06,170 --> 00:05:03,570
directed following mating of the stages

96
00:05:09,800 --> 00:05:06,180
and free flights checkout sa-7 is

97
00:05:12,170 --> 00:05:09,810
scheduled to be launched next quarter at

98
00:05:14,540 --> 00:05:12,180
Marshalls quality laboratory the booster

99
00:05:16,790 --> 00:05:14,550
for the night flight vehicle sa 9 is

100
00:05:19,490 --> 00:05:16,800
undergoing post static checkout in the

101
00:05:21,410 --> 00:05:19,500
pressure test cell following testing the

102
00:05:23,720 --> 00:05:21,420
stage will undergo electrical check out

103
00:05:27,380 --> 00:05:23,730
prior to preparation for shipment to the

104
00:05:30,290 --> 00:05:27,390
Cape early this quarter at Michou

105
00:05:32,480 --> 00:05:30,300
following pre static check out the s18

106
00:05:35,360 --> 00:05:32,490
was prepared by Chrysler for shipment to

107
00:05:37,640 --> 00:05:35,370
Marshall on April 17th the booster stage

108
00:05:39,260 --> 00:05:37,650
was loaded on the barge promise the

109
00:05:41,180 --> 00:05:39,270
stage was shipped from Michou the same

110
00:05:46,190 --> 00:05:41,190
day and arrived at Marshall on April

111
00:05:48,470 --> 00:05:46,200
26th at MSFC the booster was erected in

112
00:05:50,930 --> 00:05:48,480
the static test stand and Static firing

113
00:05:53,690 --> 00:05:50,940

preparations were begun a short duration

114
00:05:55,550 --> 00:05:53,700
firing was scheduled for May 21st but

115
00:05:57,620 --> 00:05:55,560
was rescheduled when a leak developed

116
00:06:05,600 --> 00:05:57,630
around the manhole cover in the center

117
00:06:07,760 --> 00:06:05,610
locks tank later the state successfully

118
00:06:11,090 --> 00:06:07,770
completed two separate static firings

119
00:06:14,900 --> 00:06:11,100
one for 45 seconds on May 26th the other

120
00:06:18,110 --> 00:06:14,910
for 143 seconds on June 11th on June

121
00:06:21,020 --> 00:06:18,120
24th s18 was shipped back to me Shu

122
00:06:25,780 --> 00:06:21,030
arriving on June 28th modification and

123
00:06:31,190 --> 00:06:28,400
also at Marshalls Michou operations

124
00:06:33,680 --> 00:06:31,200
checkout of the Chrysler built s 110

125
00:06:36,140 --> 00:06:33,690
began on May 4th and will be completed

126
00:06:38,120 --> 00:06:36,150
early next quarter following completion

127
00:06:42,550 --> 00:06:38,130
check out the booster we'll be prepared

128
00:06:46,040 --> 00:06:42,560
for shipment to MSFC next report period

129
00:06:48,770 --> 00:06:46,050
ad uh mrs. satty Monica facility s for

130
00:06:51,740 --> 00:06:48,780
nine checkout was completed April 28 on

131
00:06:54,740 --> 00:06:51,750
May 8 the stage was shipped to Sacto and

132
00:06:56,720 --> 00:06:54,750
installed in the static test and s for 9

133
00:07:01,460 --> 00:06:56,730
acceptance firing is scheduled during

134
00:07:04,220 --> 00:07:01,470
the next quarter meanwhile on April 25th

135
00:07:06,380 --> 00:07:04,230
the s for 8 was moved from da C's

136
00:07:09,050 --> 00:07:06,390
assembly area to the vertical checkout

137
00:07:12,020 --> 00:07:09,060
area checkout hampered because of parts

138
00:07:14,830 --> 00:07:12,030

shortages is now underway no major

139
00:07:18,470 --> 00:07:14,840
problems have been encountered to date

140
00:07:21,380 --> 00:07:18,480
also at santa monica stage assembly of

141
00:07:26,150 --> 00:07:21,390
Douglass's s410 stage continued during

142
00:07:28,040 --> 00:07:26,160
the quarter and is on schedule vibration

143
00:07:30,470 --> 00:07:28,050
testing by wiley laboratories of the

144
00:07:32,780 --> 00:07:30,480
first unpressurized designed instrument

145
00:07:35,210 --> 00:07:32,790
unit was completed during this report

146
00:07:37,370 --> 00:07:35,220
period minor modifications made in this

147
00:07:40,340 --> 00:07:37,380
unit as a result of testing will be

148
00:07:43,340 --> 00:07:40,350
incorporated on flight units siu 9 8 and

149
00:07:45,170 --> 00:07:43,350
10 completion of siu 9 component

150
00:07:47,630 --> 00:07:45,180
installation and beginning of check out

151
00:07:51,860 --> 00:07:47,640
at MSFC is scheduled for early next

152
00:07:54,200 --> 00:07:51,870
quarter on june 15th siu 8 structure was

153
00:07:56,060 --> 00:07:54,210
removed from storage and transferred to

154
00:07:58,910 --> 00:07:56,070
the manufacturing engineering laboratory

155
00:08:01,460 --> 00:07:58,920
for a component installation check out

156
00:08:02,150 --> 00:08:01,470
of SIU 8 is scheduled to start late next

157
00:08:05,000 --> 00:08:02,160
quarter

158
00:08:08,720 --> 00:08:05,010
SIU 10 is in storage awaiting start of

159
00:08:11,570 --> 00:08:08,730
component assembly next quarter a May

160
00:08:13,760 --> 00:08:11,580
20th at MSF sees test laboratory the

161
00:08:16,220 --> 00:08:13,770
complete dynamic test vehicle in the SI

162
00:08:18,770 --> 00:08:16,230
9 8 and 10 configuration had been

163
00:08:21,650 --> 00:08:18,780

installed into the test tower the upper

164
00:08:24,200 --> 00:08:21,660
stage dynamic test for the SI 9 8 and 10

165
00:08:26,510 --> 00:08:24,210
configuration which tested only the s

166
00:08:29,210 --> 00:08:26,520
for stage instrument unit Apollo

167
00:08:31,850 --> 00:08:29,220
boilerplate and micrometeoroid capsule

168
00:08:33,650 --> 00:08:31,860
was completed last quarter the complete

169
00:08:35,210 --> 00:08:33,660
vehicle test continued throughout this

170
00:08:43,570 --> 00:08:35,220
quarter and is scheduled for completion

171
00:08:49,310 --> 00:08:46,400
at Monsieur chrysler fabrication and

172
00:08:51,890 --> 00:08:49,320
assembly of the s1 b1 thrust structure

173
00:08:56,330 --> 00:08:51,900
assembly and second stage adapter were

174
00:09:02,120 --> 00:08:56,340
completed in May on June 19th clustering

175
00:09:04,460 --> 00:09:02,130
began on s1 b1 the first six h1 flight

176
00:09:06,560 --> 00:09:04,470
engines operated to two hundred thousand

177
00:09:09,410 --> 00:09:06,570
pounds thrust were delivered to Michou

178
00:09:11,810 --> 00:09:09,420
during this quarter s 1 b1 will be the

179
00:09:15,770 --> 00:09:11,820
first stage using the operated h1

180
00:09:18,140 --> 00:09:15,780
engines in mid-june fabrication began on

181
00:09:21,500 --> 00:09:18,150
the second stage adapter spider beam for

182
00:09:23,660 --> 00:09:21,510
s1 b2 the barrel assembly for this stage

183
00:09:27,850 --> 00:09:23,670
was completed during this report period

184
00:09:32,750 --> 00:09:30,740
meanwhile the s-1 B mock-up then was

185
00:09:34,760 --> 00:09:32,760
completed the fin which can be mounted

186
00:09:36,590 --> 00:09:34,770
on the tail section mock-up will

187
00:09:38,300 --> 00:09:36,600
generally be used as a development

188
00:09:41,630 --> 00:09:38,310

fixture for routing of plumbing and

189
00:09:43,880 --> 00:09:41,640
wiring during this quarter at nishu

190
00:09:45,920 --> 00:09:43,890
construction work for s1 b test

191
00:09:48,380 --> 00:09:45,930
facilities included a concrete block

192
00:09:50,180 --> 00:09:48,390
building housing the air compressor for

193
00:09:52,250 --> 00:09:50,190
the computer facility and brick and

194
00:09:56,450 --> 00:09:52,260
mortar construction on the card taped

195
00:09:59,450 --> 00:09:56,460
storage building at the close of last

196
00:10:01,550 --> 00:09:59,460
quarter the s4 be structural and dynamic

197
00:10:03,530 --> 00:10:01,560
test stages were in Douglass's vertical

198
00:10:06,280 --> 00:10:03,540
assembly towers at Huntington Beach

199
00:10:10,340 --> 00:10:08,750
early this quarter the structural test

200
00:10:12,410 --> 00:10:10,350
stage was moved from its assembly

201
00:10:14,390 --> 00:10:12,420
position and transferred to the

202
00:10:16,760 --> 00:10:14,400
structural test building where strain

203
00:10:19,070 --> 00:10:16,770
gauges and other instrumentation devices

204
00:10:20,870 --> 00:10:19,080
were installed in preparation for the

205
00:10:24,140 --> 00:10:20,880
hydrostatic portion of the structural

206
00:10:25,970 --> 00:10:24,150
test program on June 23rd the finished

207
00:10:28,520 --> 00:10:25,980
stage was moved into the hydrostatic

208
00:10:30,980 --> 00:10:28,530
tower hydrostatic pressure testing of

209
00:10:33,580 --> 00:10:30,990
the locks and lh2 tank is scheduled to

210
00:10:35,990 --> 00:10:33,590
begin in mid-july

211
00:10:38,420 --> 00:10:36,000
assembly of the propellant tanks for the

212
00:10:40,670 --> 00:10:38,430
s4 be dynamic stage was completed in

213
00:10:42,530 --> 00:10:40,680

March the stage was then moved to the

214
00:10:45,110 --> 00:10:42,540
hydrostatic test tower during

215
00:10:47,720 --> 00:10:45,120
hydrostatic test operations on the s4 be

216
00:10:49,790 --> 00:10:47,730
dynamic stage a valve controller in the

217
00:10:51,829 --> 00:10:49,800
facilities test equipment malfunctioned

218
00:10:54,050 --> 00:10:51,839
causing a negative pressure in the

219
00:10:56,569 --> 00:10:54,060
liquid hydrogen tank which resulted in

220
00:10:58,400 --> 00:10:56,579
depressions in the lh2 dome

221
00:11:00,410 --> 00:10:58,410
depressions were later popped out by

222
00:11:02,989 --> 00:11:00,420
filling the tank with water during

223
00:11:05,660 --> 00:11:02,999
inspection cracks were found in two weld

224
00:11:07,549 --> 00:11:05,670
seams these cracks were repaired and the

225
00:11:10,460 --> 00:11:07,559
stage has been successfully retested

226
00:11:12,679 --> 00:11:10,470
staged insulation installation was begun

227
00:11:16,819 --> 00:11:12,689
late this quarter and is expected to be

228
00:11:19,910 --> 00:11:16,829
completed early next quarter during this

229
00:11:22,100 --> 00:11:19,920
report period the s4 be all system stage

230
00:11:24,350 --> 00:11:22,110
was processed through assembly towers

231
00:11:26,869 --> 00:11:24,360
one and two we're welding of the LOX

232
00:11:29,840 --> 00:11:26,879
tank assembly and the lh2 forwards dome

233
00:11:31,400 --> 00:11:29,850
to the lh2 cylinder was accomplished the

234
00:11:36,919 --> 00:11:31,410
stage was then installed in the

235
00:11:39,199 --> 00:11:36,929
hydrostatic Tower a DAC Sacramento test

236
00:11:41,239 --> 00:11:39,209
facility final inspection of facility

237
00:11:43,429 --> 00:11:41,249
contractor effort at the Gama complex

238
00:11:46,009 --> 00:11:43,439

test control center and instrumentation

239
00:11:48,319 --> 00:11:46,019
center has been completed completion of

240
00:11:50,989 --> 00:11:48,329
the entire Gama complex including test

241
00:11:52,819 --> 00:11:50,999
cells has been temporarily delayed due

242
00:11:55,819 --> 00:11:52,829
primarily to late delivery of

243
00:11:58,249 --> 00:11:55,829
approximately 65 valves of various sizes

244
00:12:02,659 --> 00:11:58,259
and types inspection and testing of

245
00:12:05,059 --> 00:12:02,669
these valves is now underway also at SAC

246
00:12:06,949 --> 00:12:05,069
toes bata complex installation of

247
00:12:09,889 --> 00:12:06,959
instrumentation at beta test stands

248
00:12:11,569 --> 00:12:09,899
number one is complete the j2 engine for

249
00:12:13,579 --> 00:12:11,579
use in the battleship program was

250
00:12:15,609 --> 00:12:13,589
received in April checked out and

251
00:12:18,199 --> 00:12:15,619
subsequently attached to the stage

252
00:12:20,389 --> 00:12:18,209
preparation for cold flow testing of the

253
00:12:23,539 --> 00:12:20,399
battleship stage began the first week in

254
00:12:25,699 --> 00:12:23,549
June construction continued at beta test

255
00:12:27,919 --> 00:12:25,709
stands number three scheduled to be

256
00:12:30,499 --> 00:12:27,929
completed next quarter the stand will be

257
00:12:34,159 --> 00:12:30,509
used in testing the s4b all systems

258
00:12:35,600 --> 00:12:34,169
stage the liquid hydrogen test tank will

259
00:12:37,340 --> 00:12:35,610
be transferred next quarter from

260
00:12:39,710 --> 00:12:37,350
Marshalls manufacturing engineering

261
00:12:41,590 --> 00:12:39,720
laboratory to the test laboratory for

262
00:12:43,879 --> 00:12:41,600
additional technological testing

263
00:12:46,220 --> 00:12:43,889

insulation was installed in the tank

264
00:12:47,960 --> 00:12:46,230
during this report courier the container

265
00:12:50,479 --> 00:12:47,970
will be used in the study of super

266
00:12:54,829 --> 00:12:50,489
insulation for liquid hydrogen and LOX

267
00:12:57,289 --> 00:12:54,839
tanks also at Marshalls manufacturing

268
00:12:59,449 --> 00:12:57,299
engineering laboratory installation of

269
00:13:02,179 --> 00:12:59,459
some components is underway under Saturn

270
00:13:04,369 --> 00:13:02,189
1b instrument unit vibration test unit

271
00:13:06,619 --> 00:13:04,379
work is scheduled to be completed in

272
00:13:08,090 --> 00:13:06,629
early August then the unit will be

273
00:13:09,780 --> 00:13:08,100
prepared for shipment to Wiley

274
00:13:13,680 --> 00:13:09,790
Laboratories on August 30

275
00:13:15,990 --> 00:13:13,690
first for vibration testing fabrication

276
00:13:18,150 --> 00:13:16,000
is complete on the Saturn 1b and Saturn

277
00:13:20,250 --> 00:13:18,160
5 instrument unit for the dynamic test

278
00:13:22,200 --> 00:13:20,260
vehicle the unit will be in storage

279
00:13:24,630 --> 00:13:22,210
until August 10th when it will be

280
00:13:26,280 --> 00:13:24,640
transferred to the test site results of

281
00:13:28,530 --> 00:13:26,290
vehicle dynamic testing will furnish

282
00:13:39,510 --> 00:13:28,540
necessary data influencing control

283
00:13:41,430 --> 00:13:39,520
computer filter design a significant

284
00:13:44,250 --> 00:13:41,440
highlight of this report period was the

285
00:13:46,500 --> 00:13:44,260
gimbley of rocky tines j2 liquid rocket

286
00:13:49,020 --> 00:13:46,510
engine during the tests the engine was

287
00:13:50,760 --> 00:13:49,030
gimballed at 30 degrees per second in

288
00:13:53,700 --> 00:13:50,770

billing was programmed through three

289
00:13:57,090 --> 00:13:53,710
cycles in both phases to a maximum of 10

290
00:14:02,610 --> 00:13:57,100
degrees these hot firings met all PF RT

291
00:14:05,160 --> 00:14:02,620
requirements in April the s4b battleship

292
00:14:05,580 --> 00:14:05,170
hot-fire j2 engine was turned over to

293
00:14:08,010 --> 00:14:05,590
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