1
00:00:07,269 --> 00:00:05,349
three heavy space vehicles are being

2
00:00:10,390 --> 00:00:07,279
developed by the national aeronautics

3
00:00:15,749 --> 00:00:10,400
and space administration

4
00:00:20,470 --> 00:00:18,150
this film report number 16 will cover

5
00:00:28,150 --> 00:00:20,480
progress on the saturn 1 and 1b during

6
00:00:32,150 --> 00:00:29,990
a significant highlight of this report

7
00:00:34,790 --> 00:00:32,160
period was the checkout of pad b

8
00:00:38,310 --> 00:00:34,800
facilities launch complex 37 at cape

9
00:00:40,869 --> 00:00:38,320
canaveral using the sad5 booster the s4

10
00:00:42,470 --> 00:00:40,879
dynamics facility stage and ground

11
00:00:44,470 --> 00:00:42,480
support equipment

12
00:00:47,510 --> 00:00:44,480
wet tests at canaveral are designed to

13
00:00:50,389 --> 00:00:47,520

check out complex 37 equipment involved

14
00:00:52,950 --> 00:00:50,399
in propellant loading operations actual

15
00:00:55,029 --> 00:00:52,960
propellants are used in the tests

16
00:00:57,270 --> 00:00:55,039
simulated manual loading methods are

17
00:00:59,910 --> 00:00:57,280
checked first then the entire loading

18
00:01:01,510 --> 00:00:59,920
sequence is performed automatically

19
00:01:03,670 --> 00:01:01,520
some difficulties were encountered

20
00:01:05,350 --> 00:01:03,680
during first phase testing requiring

21
00:01:07,670 --> 00:01:05,360
additional components

22
00:01:09,750 --> 00:01:07,680
tests were resumed and successfully

23
00:01:11,910 --> 00:01:09,760
completed late in june

24
00:01:14,149 --> 00:01:11,920
following wet tests inspection revealed

25
00:01:16,950 --> 00:01:14,159
two welts on the hydrogen side of the

26
00:01:19,270 --> 00:01:16,960
common bulkhead of the s4 dynamics

27
00:01:21,030 --> 00:01:19,280
facility stage however the bulkhead

28
00:01:23,190 --> 00:01:21,040
showed no signs of leakage during the

29
00:01:25,510 --> 00:01:23,200
liquid hydrogen loading tests and the

30
00:01:32,710 --> 00:01:25,520
stage is acceptable for stratification

31
00:01:36,950 --> 00:01:34,950
also at the atlantic missile range work

32
00:01:38,550 --> 00:01:36,960
on saturn launch sites is progressing

33
00:01:40,950 --> 00:01:38,560
satisfactorily

34
00:01:43,510 --> 00:01:40,960
construction of launch complex 34's

35
00:01:45,510 --> 00:01:43,520
liquid hydrogen facility is on schedule

36
00:01:51,429 --> 00:01:45,520
with completion expected late next

37
00:02:01,030 --> 00:01:54,550
the design work on pad a complex 37 to

38
00:02:04,789 --> 00:02:02,789

the saturn one instrument unit

39
00:02:07,350 --> 00:02:04,799
electrical support equipment for pad b

40
00:02:10,550 --> 00:02:07,360
complex 37 arrived at the cape in late

41
00:02:15,510 --> 00:02:12,630
meanwhile at marshall the booster for

42
00:02:17,670 --> 00:02:15,520
the fifth saturn one flight vehicle sa5

43
00:02:19,589 --> 00:02:17,680
entered post static checkout

44
00:02:22,229 --> 00:02:19,599
discrepancies were discovered

45
00:02:24,229 --> 00:02:22,239
particularly in the propulsion system

46
00:02:26,070 --> 00:02:24,239
rework was necessary

47
00:02:28,309 --> 00:02:26,080
following completion of rework

48
00:02:29,350 --> 00:02:28,319
electrical systems checkout started in

49
00:02:31,110 --> 00:02:29,360
mid-may

50
00:02:33,670 --> 00:02:31,120
the booster will be shipped for arrival

51
00:02:37,350 --> 00:02:33,680
at the cape about two weeks before s45

52
00:02:41,910 --> 00:02:39,830
located at marshall's quality division

53
00:02:44,309 --> 00:02:41,920
is a saturn instrument unit motion

54
00:02:46,790 --> 00:02:44,319
simulator used for attitude calibration

55
00:02:49,270 --> 00:02:46,800
of the stabilizer and control system of

56
00:02:51,110 --> 00:02:49,280
the sa-5 instrument unit

57
00:02:53,830 --> 00:02:51,120
positioning capabilities are in three

58
00:02:56,229 --> 00:02:53,840
axes with displacement accuracy of one

59
00:02:57,830 --> 00:02:56,239
percent of displacement angle

60
00:02:59,910 --> 00:02:57,840
positioning the unit for attitude

61
00:03:02,070 --> 00:02:59,920
calibrations and simulated flight

62
00:03:04,309 --> 00:03:02,080
position leaves all components in their

63
00:03:06,229 --> 00:03:04,319

respective flight configurations

64
00:03:09,750 --> 00:03:06,239
eliminating loading effects from long

65
00:03:11,670 --> 00:03:09,760
cables and extraneous noise pickup

66
00:03:13,350 --> 00:03:11,680
the control system has automation

67
00:03:15,509 --> 00:03:13,360
capabilities that can be computer

68
00:03:17,270 --> 00:03:15,519
controlled permitting complete automated

69
00:03:23,430 --> 00:03:17,280
calibration and checkout of control

70
00:03:28,470 --> 00:03:25,589
the booster for the sixth flight vehicle

71
00:03:30,869 --> 00:03:28,480
sa-6 underwent two successful static

72
00:03:32,949 --> 00:03:30,879
test firings at marshall's test division

73
00:03:35,750 --> 00:03:32,959
the first for 35 seconds and the second

74
00:03:37,830 --> 00:03:35,760
for a period of 142 seconds

75
00:03:40,789 --> 00:03:37,840
post test inspection revealed minor

76
00:03:42,949 --> 00:03:40,799
discrepancies such as small fuel leaks

77
00:03:49,670 --> 00:03:42,959
and a torn gox diffuser screen

78
00:03:54,710 --> 00:03:52,309
the sa-6 booster second in the block 2

79
00:03:59,190 --> 00:03:54,720
series is now undergoing post static

80
00:04:03,429 --> 00:04:01,190
assembly of the booster for the seventh

81
00:04:05,429 --> 00:04:03,439
saturn flight test vehicle sa-7 was

82
00:04:11,350 --> 00:04:05,439
completed this quarter and the stage is

83
00:04:15,429 --> 00:04:13,270
structural fabrication of the spider

84
00:04:18,469 --> 00:04:15,439
beam for the ninth saturn flight vehicle

85
00:04:20,469 --> 00:04:18,479
sa-9 is complete assembly operations on

86
00:04:24,310 --> 00:04:20,479
the tail section and clustering of tanks

87
00:04:28,070 --> 00:04:26,150
the fairchild stratos corporation of

88
00:04:30,150 --> 00:04:28,080

hagerstown maryland is now underway in

89
00:04:32,390 --> 00:04:30,160
the fabrication of various components

90
00:04:34,230 --> 00:04:32,400
related to the micro meteoroid

91
00:04:36,550 --> 00:04:34,240
measurement device which will fly aboard

92
00:04:38,629 --> 00:04:36,560
sa-9 and sa-8

93
00:04:44,710 --> 00:04:38,639
manufacturing of the wing panels for the

94
00:04:49,670 --> 00:04:46,870
testing wing panel capacitors is

95
00:04:51,749 --> 00:04:49,680
accomplished by using a vacuum belt jar

96
00:04:54,390 --> 00:04:51,759
electronic components are subjected to

97
00:04:56,469 --> 00:04:54,400
rigid testing prior to acceptance

98
00:05:00,790 --> 00:04:56,479
micro modules are inspected through the

99
00:05:04,790 --> 00:05:02,550
chrysler corporation production

100
00:05:06,469 --> 00:05:04,800
contractor for saturn one and one b

101
00:05:08,629 --> 00:05:06,479
boosters at marshall's michoud

102
00:05:10,629 --> 00:05:08,639
operations in new orleans complete

103
00:05:12,230 --> 00:05:10,639
clustering of all propellant containers

104
00:05:14,550 --> 00:05:12,240
for the booster for the eighth flight

105
00:05:17,110 --> 00:05:14,560
vehicle sa-8 during this quarter

106
00:05:21,110 --> 00:05:17,120
delivery has been made of all h1 engines

107
00:05:25,110 --> 00:05:23,189
also fabrication of the barrel assembly

108
00:05:27,749 --> 00:05:25,120
and thrust and fin outriggers for the

109
00:05:29,430 --> 00:05:27,759
10th flight vehicle essay 10 is complete

110
00:05:32,469 --> 00:05:29,440
fabrication of the spider beam and

111
00:05:34,310 --> 00:05:32,479
thrust structure is underway

112
00:05:36,150 --> 00:05:34,320
at marshall's mishu operations

113
00:05:37,990 --> 00:05:36,160

construction work this quarter included

114
00:05:40,070 --> 00:05:38,000
the building of electronic fabrication

115
00:05:41,830 --> 00:05:40,080
and checkout facility

116
00:05:43,510 --> 00:05:41,840
and the installation of air conditioning

117
00:05:46,310 --> 00:05:43,520
systems in various offices and

118
00:05:50,310 --> 00:05:48,469
all construction work is being done

119
00:05:52,390 --> 00:05:50,320
under the direction of michoud's support

120
00:05:55,110 --> 00:05:52,400
services contractor the mason rust

121
00:05:58,950 --> 00:05:57,189
dynamic testing of the s4 stage

122
00:06:00,950 --> 00:05:58,960
instrument unit with both the jupiter

123
00:06:03,110 --> 00:06:00,960
nose cone and the boilerplate apollo

124
00:06:05,029 --> 00:06:03,120
spacecraft began at marshall's test

125
00:06:08,950 --> 00:06:05,039
division early this quarter and was

126
00:06:14,230 --> 00:06:11,749
the sad5 booster at the cape for complex

127
00:06:16,710 --> 00:06:14,240
37 facilities checkout was removed from

128
00:06:18,390 --> 00:06:16,720
pad b in late june and will be returned

129
00:06:23,350 --> 00:06:18,400
to marshall during the next quarter for

130
00:06:27,029 --> 00:06:25,350
a new clean facility was placed in

131
00:06:29,350 --> 00:06:27,039
operation this quarter in marshall's

132
00:06:31,430 --> 00:06:29,360
manufacturing engineering division the

133
00:06:32,870 --> 00:06:31,440
clean area is subjected to a higher

134
00:06:35,350 --> 00:06:32,880
internal air pressure in order to

135
00:06:38,070 --> 00:06:35,360
minimize the possibility of contaminants

136
00:06:39,990 --> 00:06:38,080
entering the room from external sources

137
00:06:41,830 --> 00:06:40,000
saturn vehicle parts to be clean are

138
00:06:44,710 --> 00:06:41,840

disassembled and passed through a drying

139
00:06:49,510 --> 00:06:46,870
then washed in an electronic cleaning

140
00:06:51,749 --> 00:06:49,520
vat filtering equipment removes

141
00:06:54,950 --> 00:06:51,759
contaminants down to the 10 micron or

142
00:06:58,550 --> 00:06:56,950
a final check of the part is made by

143
00:07:00,870 --> 00:06:58,560
using a microscope

144
00:07:03,350 --> 00:07:00,880
after completion of the cleaning process

145
00:07:05,749 --> 00:07:03,360
all parts are hermetically sealed then

146
00:07:08,390 --> 00:07:05,759
sent to the user

147
00:07:10,870 --> 00:07:08,400
the rl10 engine hydraulic actuator

148
00:07:12,950 --> 00:07:10,880
simulator for the s4 stage was tested

149
00:07:15,430 --> 00:07:12,960
this quarter at marshall for test

150
00:07:18,790 --> 00:07:15,440
purposes an engine is not used but is

151
00:07:21,430 --> 00:07:18,800
simulated by the masses pendulum

152
00:07:23,670 --> 00:07:21,440
two hydraulic actuators mounted 90

153
00:07:27,510 --> 00:07:23,680
degrees to each other represent either

154
00:07:29,589 --> 00:07:27,520
the vehicle's pitch or yaw axis

155
00:07:31,270 --> 00:07:29,599
the hydraulic actuator system reacts to

156
00:07:33,430 --> 00:07:31,280
the angle commanded by the vehicle's

157
00:07:35,749 --> 00:07:33,440
guidance system allowing for attitude

158
00:07:37,990 --> 00:07:35,759
control in the pitch and yaw planes

159
00:07:39,990 --> 00:07:38,000
stabilization and reduction of vehicle

160
00:07:42,230 --> 00:07:40,000
bending

161
00:07:44,150 --> 00:07:42,240
test analysis will help determine if the

162
00:07:47,110 --> 00:07:44,160
flight control circuits and mechanical

163
00:07:50,309 --> 00:07:47,120

power converters are adequate to satisfy

164
00:07:52,390 --> 00:07:50,319
vehicle requirements for flight

165
00:07:53,909 --> 00:07:52,400
at platten whitney's florida research

166
00:07:56,869 --> 00:07:53,919
and development center at west palm

167
00:07:59,270 --> 00:07:56,879
beach s4 stage rl10 engines are

168
00:08:01,670 --> 00:07:59,280
thoroughly inspected prior to acceptance

169
00:08:03,510 --> 00:08:01,680
each engine is inspected visually then

170
00:08:04,790 --> 00:08:03,520
taken into a booth for a black light

171
00:08:07,350 --> 00:08:04,800
inspection

172
00:08:09,430 --> 00:08:07,360
using an ultraviolet lamp all pump

173
00:08:11,830 --> 00:08:09,440
inlets and valves are examined carefully

174
00:08:13,909 --> 00:08:11,840
for defects utmost precautions are

175
00:08:20,309 --> 00:08:13,919
always taken with all parts associated

176
00:08:24,950 --> 00:08:22,869
after its final acceptance test each

177
00:08:26,629 --> 00:08:24,960
rl10 engine is weighed with all

178
00:08:28,390 --> 00:08:26,639
equipment attached

179
00:08:30,309 --> 00:08:28,400
the vehicle manufacturer must know the

180
00:08:31,909 --> 00:08:30,319
engine center of gravity since this is a

181
00:08:37,029 --> 00:08:31,919
factor which can strongly affect the

182
00:08:41,190 --> 00:08:39,110
at marshall's test division construction

183
00:08:43,350 --> 00:08:41,200
work was completed this quarter on a

184
00:08:52,949 --> 00:08:43,360
prototype sound suppression stand which

185
00:08:58,230 --> 00:08:56,150
the 165 000 pound thrust engine is fired

186
00:09:00,550 --> 00:08:58,240
into the suppressor tank results of the

187
00:09:03,430 --> 00:09:00,560
firings will provide data related to the

188
00:09:05,430 --> 00:09:03,440

basic acoustical scaling laws the sound

189
00:09:07,430 --> 00:09:05,440
suppression facility will itself be a

190
00:09:09,350 --> 00:09:07,440
model for much larger power plant

191
00:09:11,030 --> 00:09:09,360
suppression systems

192
00:09:13,190 --> 00:09:11,040
acoustic measurements are made during

193
00:09:17,590 --> 00:09:13,200
tests to check the effectiveness of the

194
00:09:22,230 --> 00:09:20,070
at rocketdyne's canoga park facility

195
00:09:24,070 --> 00:09:22,240
stainless steel furnace brazed thrust

196
00:09:26,470 --> 00:09:24,080
chambers for h1 engines are being

197
00:09:34,790 --> 00:09:26,480
developed to provide longer test life

198
00:09:39,269 --> 00:09:36,630
the first unit has successfully

199
00:09:41,350 --> 00:09:39,279
completed 2300 seconds of main stage

200
00:09:45,990 --> 00:09:41,360
engine test and the overall braze

201
00:09:50,070 --> 00:09:47,829
another development at rocketdyne was

202
00:09:52,070 --> 00:09:50,080
the testing of three types of injectors

203
00:09:53,190 --> 00:09:52,080
the low differential pressure fuel locks

204
00:09:57,750 --> 00:09:53,200
injector

205
00:10:01,910 --> 00:09:59,670
and the low differential pressure fuel

206
00:10:03,750 --> 00:10:01,920
injector the modified wagon wheel

207
00:10:08,710 --> 00:10:03,760
injector exhibited high frequency

208
00:10:13,190 --> 00:10:11,190
on may 4th the s4 battleship test

209
00:10:15,590 --> 00:10:13,200
program was completed at douglas's

210
00:10:18,870 --> 00:10:15,600
sacramento test operations with a final

211
00:10:20,550 --> 00:10:18,880
locks depletion firing of 444 seconds a

212
00:10:22,310 --> 00:10:20,560
total of five thousand four hundred and

213
00:10:26,630 --> 00:10:22,320

forty seconds of engine firings was

214
00:10:30,710 --> 00:10:28,710
at the conclusion of the firing program

215
00:10:33,269 --> 00:10:30,720
gimbal tests were run on the battleship

216
00:10:35,509 --> 00:10:33,279
vehicle to provide needed dynamic data

217
00:10:37,190 --> 00:10:35,519
on the engine actuation system the

218
00:10:39,350 --> 00:10:37,200
battleship tank was then stripped of

219
00:10:41,350 --> 00:10:39,360
accessories five of the engines and the

220
00:10:43,190 --> 00:10:41,360
tank were shipped to marshall the tank

221
00:10:45,350 --> 00:10:43,200
will be used for slash tests and the

222
00:10:50,069 --> 00:10:45,360
engines will be used on the s4 dynamic

223
00:10:54,790 --> 00:10:52,630
on april 1st at sacdo the initial all

224
00:10:57,030 --> 00:10:54,800
systems vehicle propellant loading test

225
00:10:59,190 --> 00:10:57,040
was aborted when a fill nozzle leak

226
00:11:01,110 --> 00:10:59,200
caused damage to the test stand

227
00:11:03,910 --> 00:11:01,120
corrective action was taken and the

228
00:11:06,230 --> 00:11:03,920
second test began on april 9th about one

229
00:11:08,389 --> 00:11:06,240
minute after storage pressure increase

230
00:11:09,750 --> 00:11:08,399
observers noted tank canning in a

231
00:11:11,750 --> 00:11:09,760
vertical plane

232
00:11:13,110 --> 00:11:11,760
canning partially smoothed out after

233
00:11:15,190 --> 00:11:13,120
several seconds

234
00:11:17,750 --> 00:11:15,200
following necessary internal insulation

235
00:11:20,550 --> 00:11:17,760
repair tacking procedures were modified

236
00:11:23,030 --> 00:11:20,560
and tests resumed problems encountered

237
00:11:25,829 --> 00:11:23,040
during detaching indicated leaks in the

238
00:11:27,829 --> 00:11:25,839

common bulkhead

239
00:11:29,829 --> 00:11:27,839
the vehicle was removed from the stand

240
00:11:32,150 --> 00:11:29,839
in mid bay for bulkhead weld and

241
00:11:34,310 --> 00:11:32,160
insulation patching additional tanking

242
00:11:37,030 --> 00:11:34,320
operations on test stand one will begin

243
00:11:40,069 --> 00:11:37,040
early next quarter

244
00:11:42,150 --> 00:11:40,079
on april 16th the s45 flight vehicle was

245
00:11:43,990 --> 00:11:42,160
moved from douglas's santa monica plant

246
00:11:46,389 --> 00:11:44,000
to the docks at san pedro

247
00:11:47,910 --> 00:11:46,399
the stage was transported aboard a barge

248
00:11:50,470 --> 00:11:47,920
to begin its water journey to the

249
00:11:52,550 --> 00:11:50,480
sacramento test facility the stage

250
00:11:54,310 --> 00:11:52,560
arrived at its destination five days

251
00:11:56,470 --> 00:11:54,320
later and was checked out in the

252
00:11:58,949 --> 00:11:56,480
engineering and development building

253
00:12:04,870 --> 00:11:58,959
prior to being installed in test stand

254
00:12:09,590 --> 00:12:07,670
the s45 was installed in test stand 2b

255
00:12:10,470 --> 00:12:09,600
and pre-static checkout began in late

256
00:12:12,629 --> 00:12:10,480
june

257
00:12:18,629 --> 00:12:12,639
a full duration hot firing is scheduled

258
00:12:22,949 --> 00:12:20,790
at santa monica douglas successfully

259
00:12:24,949 --> 00:12:22,959
bulge formed an aluminum sheet yielding

260
00:12:26,310 --> 00:12:24,959
two segments for the s4b stage's

261
00:12:28,230 --> 00:12:26,320
bulkhead dome

262
00:12:29,829 --> 00:12:28,240
bulge die techniques may be used to

263
00:12:31,990 --> 00:12:29,839

augment segment production on the

264
00:12:34,069 --> 00:12:32,000
stretch press

265
00:12:35,670 --> 00:12:34,079
overall construction on the s4b

266
00:12:37,910 --> 00:12:35,680
facilities at huntington beach is

267
00:12:39,670 --> 00:12:37,920
continuing during this quarter the

268
00:12:41,430 --> 00:12:39,680
fabrication and assembly building was

269
00:12:44,069 --> 00:12:41,440
completed and tooling installation was

270
00:12:47,430 --> 00:12:45,750
chicago bridge and iron company

271
00:12:49,750 --> 00:12:47,440
subcontractor for douglas shipped

272
00:12:52,069 --> 00:12:49,760
sections of the battleship tank to sacto

273
00:12:54,710 --> 00:12:52,079
from its salt lake city facility

274
00:12:56,310 --> 00:12:54,720
fabrication of the tank started in april

275
00:13:00,629 --> 00:12:56,320
and is scheduled for completion in

276
00:13:04,629 --> 00:13:02,470
douglas aircraft company has shipped a

277
00:13:07,110 --> 00:13:04,639
full-scale mock-up of the forward dome

278
00:13:08,870 --> 00:13:07,120
and skirt section of the s4b stage to

279
00:13:10,710 --> 00:13:08,880
marshall this quarter

280
00:13:13,269 --> 00:13:10,720
the mock-up will be used in connection

281
00:13:19,509 --> 00:13:13,279
with design of the saturn 1b instrument

282
00:13:24,230 --> 00:13:21,350
a two-month contract was led to

283
00:13:26,389 --> 00:13:24,240
aerospace lines incorporated by marshall

284
00:13:29,829 --> 00:13:26,399
to study the feasibility of using a

285
00:13:32,389 --> 00:13:29,839
modified boeing c97 for air transport of

286
00:13:34,470 --> 00:13:32,399
the s4 stage one and a half million

287
00:13:35,990 --> 00:13:34,480
pound thrust rocket engines and other

288
00:13:37,509 --> 00:13:36,000

massive components

289
00:13:39,750 --> 00:13:37,519
this mode of transportation would

290
00:13:42,230 --> 00:13:39,760
greatly reduce time required to move the

291
00:13:44,069 --> 00:13:42,240
cargo from the west coast to points in

292
00:13:46,710 --> 00:13:44,079
the south and east

293
00:13:49,509 --> 00:13:46,720
the modified strata cruiser now known as

294
00:13:51,990 --> 00:13:49,519
the b377pg

295
00:13:54,629 --> 00:13:52,000
pregnant guppy has successfully

296
00:13:59,269 --> 00:13:54,639
transported an inert saturn stage from

297
00:14:03,670 --> 00:14:01,430
the guppy is now undergoing rigid

298
00:14:05,910 --> 00:14:03,680
testing to prove its takeoff in flight

299
00:14:08,629 --> 00:14:05,920
and landing capabilities during federal

300
00:14:10,470 --> 00:14:08,639
aviation agency qualification tests

301
00:14:13,189 --> 00:14:10,480
these flights are expected to cut

302
00:14:15,189 --> 00:14:13,199
transportation time from three weeks now

303
00:14:17,990 --> 00:14:15,199
required for barging cargo through the