1
00:00:16,099 --> 00:00:13,730
Saturn five quarterly film reports

2
00:00:19,450 --> 00:00:16,109
number six covers progress during the

3
00:00:21,980 --> 00:00:19,460
period March April and May 1964

4
00:00:27,769 --> 00:00:21,990
highlighting Saturn ground test stage

5
00:00:30,290 --> 00:00:27,779
construction prime contractor for the

6
00:00:32,659 --> 00:00:30,300
s1c is Boeing aircraft company

7
00:00:36,709 --> 00:00:32,669
responsible for fabrication and assembly

8
00:00:41,150 --> 00:00:36,719
of ten of the 14 presently scheduled s1c

9
00:00:43,610 --> 00:00:41,160
stages the remaining stages are being or

10
00:00:46,790 --> 00:00:43,620
will be assembled by Marshall using

11
00:00:48,979 --> 00:00:46,800
Boeing supplied components s1c efforts

12
00:00:51,380 --> 00:00:48,989
at Marshall this quarter were primarily

13
00:00:54,860 --> 00:00:51,390

in support of the test fuel tank and the

14
00:00:56,900 --> 00:00:54,870
static test stage on March 6th the test

15
00:00:58,880 --> 00:00:56,910
fuel tank was removed from the vertical

16
00:01:01,670 --> 00:00:58,890
Assembly Building where the forward and

17
00:01:03,830 --> 00:01:01,680
aft adaptors had been attached that was

18
00:01:06,350 --> 00:01:03,840
moved to the center's structural test

19
00:01:08,990 --> 00:01:06,360
area here the tank was placed in the

20
00:01:10,490 --> 00:01:09,000
test stand and preparations began for

21
00:01:13,160 --> 00:01:10,500
the structural testing which is

22
00:01:15,170 --> 00:01:13,170
scheduled in June the first phase of the

23
00:01:18,830 --> 00:01:15,180
test program will be a full pressure

24
00:01:22,789 --> 00:01:18,840
hydrostatic test / vibration and burst

25
00:01:26,749 --> 00:01:22,799
tests will be conducted later Assembly

26
00:01:29,420 --> 00:01:26,759
of the s1 CT static test stage continued

27
00:01:31,399 --> 00:01:29,430
to progress during the report period the

28
00:01:33,289 --> 00:01:31,409
upper half of the fuel tank was moved

29
00:01:36,350 --> 00:01:33,299
into the vertical Assembly Building in

30
00:01:41,179 --> 00:01:36,360
early March and hoisted temporarily into

31
00:01:43,340 --> 00:01:41,189
the hydrostatic tower a week later the

32
00:01:45,980 --> 00:01:43,350
lower half of the fuel tank was moved

33
00:01:52,399 --> 00:01:45,990
into the VAB and positioned on the

34
00:01:55,429 --> 00:01:52,409
rotary turntable in mid-april the upper

35
00:01:59,929 --> 00:01:55,439
and lower halves of the s1 CT fuel tank

36
00:02:02,990 --> 00:01:59,939
were welded together the first of five

37
00:02:06,230 --> 00:02:03,000
locks tunnels for the s1 CT fuel tank

38
00:02:08,180 --> 00:02:06,240

was installed in mid-may the fuel tank

39
00:02:10,430 --> 00:02:08,190
had been moved to the hydrostatic tower

40
00:02:12,559 --> 00:02:10,440
for this operation so that the vertical

41
00:02:13,820 --> 00:02:12,569
assembly buildings rotary turntable

42
00:02:18,560 --> 00:02:13,830
would be available for

43
00:02:20,750 --> 00:02:18,570
on the s-1 Satie lot tank completion of

44
00:02:25,700 --> 00:02:20,760
locks tunnel installation is expected

45
00:02:28,370 --> 00:02:25,710
early next quarter the lower bulkhead

46
00:02:30,980 --> 00:02:28,380
assembly of the s-1 SAT locks tank was

47
00:02:34,340 --> 00:02:30,990
completed in late May and moved under

48
00:02:36,110 --> 00:02:34,350
the rotary turntable where the lower

49
00:02:40,340 --> 00:02:36,120
intermediate skinned section will be

50
00:02:42,290 --> 00:02:40,350
welded to it next quarter the LOX tank

51
00:02:44,300 --> 00:02:42,300
differs from the fuel tank in the

52
00:02:49,880 --> 00:02:44,310
addition of two intermediate skin

53
00:02:52,160 --> 00:02:49,890
sections welding on the upper bulkhead

54
00:02:56,360 --> 00:02:52,170
assembly was completed near the end of

55
00:02:58,400 --> 00:02:56,370
this report period following welding of

56
00:03:00,740 --> 00:02:58,410
the upper intermediate skin section to

57
00:03:02,900 --> 00:03:00,750
this assembly the upper and lower halves

58
00:03:05,180 --> 00:03:02,910
will be mated in the vertical Assembly

59
00:03:09,820 --> 00:03:05,190
Building next quarter to complete the

60
00:03:16,070 --> 00:03:12,740
installation of the 16 skin panels on

61
00:03:18,259 --> 00:03:16,080
the s-1 CT thrust structure has now been

62
00:03:22,750 --> 00:03:18,269
completed installation of the heat

63
00:03:27,890 --> 00:03:25,250

component hardware for the s-1 C

64
00:03:30,470 --> 00:03:27,900
structural test stage is being received

65
00:03:34,180 --> 00:03:30,480
at Marshall from Boeing and fuel tank

66
00:03:37,190 --> 00:03:34,190
bulkhead fabrication is underway

67
00:03:39,670 --> 00:03:37,200
construction of Marshalls s1c static

68
00:03:41,990 --> 00:03:39,680
test stand continued during the quarter

69
00:03:45,009 --> 00:03:42,000
completion of initial construction is

70
00:03:48,430 --> 00:03:45,019
expected by the end of this year a

71
00:03:51,530 --> 00:03:48,440
full-size mock-up of the s-1 sea stage

72
00:03:55,759 --> 00:03:51,540
139 feet long and 33 feet in diameter

73
00:03:58,070 --> 00:03:55,769
has been built by Boeing at Michou the

74
00:04:00,320 --> 00:03:58,080
size angle and other measurements of

75
00:04:02,870 --> 00:04:00,330
tubes and wires will be determined from

76
00:04:07,130 --> 00:04:02,880
the mock-up and the information used in

77
00:04:10,400 --> 00:04:07,140
production of flight stages bulkhead

78
00:04:13,340 --> 00:04:10,410
fabrication work for the s1 CD dynamic

79
00:04:18,199 --> 00:04:13,350
test stage is underway by bowing at the

80
00:04:20,150 --> 00:04:18,209
Misha plant fabrication of other s1 C

81
00:04:23,230 --> 00:04:20,160
components continued during the report

82
00:04:25,700 --> 00:04:23,240
period at Boeing Michou and Wichita this

83
00:04:27,530 --> 00:04:25,710
cruciform baffle for example was

84
00:04:31,610 --> 00:04:27,540
manufactured for installation

85
00:04:33,770 --> 00:04:31,620
in the lore of UO bulkhead these

86
00:04:36,200 --> 00:04:33,780
propellant line support structures are

87
00:04:40,070 --> 00:04:36,210
used to support the LOX tunnels in the

88
00:04:42,380 --> 00:04:40,080

thrust structure this adapter fitting

89
00:04:44,570 --> 00:04:42,390
will serve as a terminal fitting for one

90
00:04:47,390 --> 00:04:44,580
arm of the engine actuator support

91
00:04:55,760 --> 00:04:47,400
assembly and as the attach point for the

92
00:04:57,470 --> 00:04:55,770
solid propellant retrorocket at the co

93
00:04:59,780 --> 00:04:57,480
beach facility of north american

94
00:05:02,930 --> 00:04:59,790
aviation space and information systems

95
00:05:05,030 --> 00:05:02,940
division as to manufacturing activities

96
00:05:07,370 --> 00:05:05,040
progressed steadily during this report

97
00:05:10,070 --> 00:05:07,380
period the forward liquid hydrogen

98
00:05:12,590 --> 00:05:10,080
bulkhead for the s2s stage was

99
00:05:14,510 --> 00:05:12,600
hydrostatically tested and satisfactory

100
00:05:18,020 --> 00:05:14,520
helium leak detection tests were

101
00:05:19,790 --> 00:05:18,030
performed subsequently the bulkhead was

102
00:05:21,980 --> 00:05:19,800
cleaned and acid-etched

103
00:05:25,210 --> 00:05:21,990
then turned over in the turnover fixture

104
00:05:27,860 --> 00:05:25,220
to apply protective coating to the dome

105
00:05:29,600 --> 00:05:27,870
on March 30th the bulkhead was

106
00:05:31,760 --> 00:05:29,610
transferred to the vertical Assembly

107
00:05:35,630 --> 00:05:31,770
Building and positioned over liquid

108
00:05:37,610 --> 00:05:35,640
hydrogen cylinder number 6 during May

109
00:05:41,990 --> 00:05:37,620
the bulkhead and cylinder were joined

110
00:05:44,360 --> 00:05:42,000
together by a circumferential weld in

111
00:05:47,090 --> 00:05:44,370
fabrication worked on the s2s stage

112
00:05:48,710 --> 00:05:47,100
common bulkhead all meridian welds on

113
00:05:50,960 --> 00:05:48,720

the forward facing sheet have been

114
00:05:55,780 --> 00:05:50,970
completed the dollar section installed

115
00:06:00,500 --> 00:05:58,400
meridian and dollar section welding was

116
00:06:03,260 --> 00:06:00,510
also finished on the common bulkhead aft

117
00:06:07,760 --> 00:06:03,270
facing sheet for the bulkhead test tank

118
00:06:10,730 --> 00:06:07,770
during April liquid hydrogen tank

119
00:06:13,820 --> 00:06:10,740
cylinder fabrication for the s2s stage

120
00:06:15,530 --> 00:06:13,830
continued this quarter during April the

121
00:06:18,290 --> 00:06:15,540
quarter panels of cylinder number four

122
00:06:20,510 --> 00:06:18,300
were joined by vertical wells and the

123
00:06:22,940 --> 00:06:20,520
assemble cylinder was circumferentially

124
00:06:25,310 --> 00:06:22,950
trimmed vertical welding was also

125
00:06:30,260 --> 00:06:25,320
underway on quarter panels for cylinder

126
00:06:33,010 --> 00:06:30,270
number five at Essen IDs s two-stage

127
00:06:35,510 --> 00:06:33,020
propulsion test facility at Santa Susana

128
00:06:37,990 --> 00:06:35,520
construction of the battleship stage and

129
00:06:40,070 --> 00:06:38,000
KOCO one test stand is complete and

130
00:06:43,159 --> 00:06:40,080
installation of systems will be

131
00:06:45,920 --> 00:06:43,169
next quarter the coca for all systems

132
00:06:48,709 --> 00:06:45,930
test stand construction effort is also

133
00:06:57,619 --> 00:06:48,719
complete and the 60 turn capacity hoist

134
00:07:00,230 --> 00:06:57,629
is operational at the beginning of this

135
00:07:02,330 --> 00:07:00,240
quarter the s4b hydro static and dynamic

136
00:07:04,550 --> 00:07:02,340
test stages were in Douglas Aircraft

137
00:07:09,860 --> 00:07:04,560
company's vertical assembly towers at

138
00:07:11,779 --> 00:07:09,870

Huntington Beach the hydrostatic test

139
00:07:14,119 --> 00:07:11,789
stage was later moved from its assembly

140
00:07:16,100 --> 00:07:14,129
Tower and placed in the structures test

141
00:07:18,320 --> 00:07:16,110
building where strain gauges and other

142
00:07:20,420 --> 00:07:18,330
instrumentation devices were installed

143
00:07:24,110 --> 00:07:20,430
in preparation for the start of

144
00:07:26,839 --> 00:07:24,120
hydrostatic testing next quarter in

145
00:07:29,450 --> 00:07:26,849
assembly work on the s4b dynamic test

146
00:07:31,490 --> 00:07:29,460
stage welding of the locks and liquid

147
00:07:33,409 --> 00:07:31,500
hydrogen tanks as well as internal

148
00:07:36,080 --> 00:07:33,419
welding of the forward liquid hydrogen

149
00:07:38,240 --> 00:07:36,090
dome to the liquid hydrogen tank was

150
00:07:46,100 --> 00:07:38,250
completed in mid-march at Huntington

151
00:07:48,320 --> 00:07:46,110
Beach during this report period the s4

152
00:07:50,360 --> 00:07:48,330
be all system stage was processed

153
00:07:52,730 --> 00:07:50,370
through assembly towers one and two

154
00:07:54,800 --> 00:07:52,740
where necessary welding was accomplished

155
00:07:59,390 --> 00:07:54,810
and was installed in the hydrostatic

156
00:08:02,149 --> 00:07:59,400
tower at Douglas a Sacramento test

157
00:08:04,339 --> 00:08:02,159
facility satisfactory final inspection a

158
00:08:06,320 --> 00:08:04,349
facility contractor effort at the Gama

159
00:08:08,749 --> 00:08:06,330
complex test control center and

160
00:08:10,420 --> 00:08:08,759
instrumentation center was performed

161
00:08:14,390 --> 00:08:10,430
March 25th

162
00:08:16,459 --> 00:08:14,400
at SAC toes bata complex installation of

163
00:08:19,100 --> 00:08:16,469

instrumentation at beta test stands

164
00:08:21,110 --> 00:08:19,110
number one is continuing and cold flow

165
00:08:25,730 --> 00:08:21,120
testing of the battleship stage is

166
00:08:28,189 --> 00:08:25,740
expected to begin in June at beta test

167
00:08:30,140 --> 00:08:28,199
stand number 3 construction continued

168
00:08:32,449 --> 00:08:30,150
during the report period with completion

169
00:08:34,399 --> 00:08:32,459
scheduled next quarter the stand will be

170
00:08:46,180 --> 00:08:34,409
used for test programs with the all

171
00:08:51,440 --> 00:08:49,220
on April 21st at the rocket engine test

172
00:08:55,190 --> 00:08:51,450
site Edwards Air Force Base during the

173
00:08:58,010 --> 00:08:55,200
informal pfr t on f1 R&D engine number

174
00:09:01,220 --> 00:08:58,020
oh one nine a LOX pump explosion

175
00:09:03,320 --> 00:09:01,230
occurred at 111 seconds into the run the

176
00:09:04,910 --> 00:09:03,330
test stand suffered damage similar to

177
00:09:06,980 --> 00:09:04,920
that which occurred during the previous

178
00:09:10,130 --> 00:09:06,990
puff explosion on engine number oh one

179
00:09:12,440 --> 00:09:10,140
four in February approximately three

180
00:09:14,750 --> 00:09:12,450
weeks were required for Stan's repair as

181
00:09:17,510 --> 00:09:14,760
a result of the April explosion all

182
00:09:20,210 --> 00:09:17,520
engine system in turboprop testing with

183
00:09:22,160 --> 00:09:20,220
LOX was halted while a team composed of

184
00:09:24,440 --> 00:09:22,170
members from Rocketdyne and Marshall

185
00:09:24,980 --> 00:09:24,450
conducted a thorough investigation of

186
00:09:27,730 --> 00:09:24,990
the matter

187
00:09:32,019 --> 00:09:27,740
testing was resumed May 15th after

188
00:09:35,060 --> 00:09:32,029

incorporation of recommended changes

189
00:09:38,750 --> 00:09:35,070
production test stand one D at Edwards

190
00:09:43,430 --> 00:09:38,760
was completed this quarter work on stand

191
00:09:47,420 --> 00:09:43,440
1 C is in its final phases stand 1e

192
00:09:49,160 --> 00:09:47,430
activation is due in the fall the

193
00:10:00,079 --> 00:09:49,170
control center at the production test

194
00:10:04,489 --> 00:10:02,480
at the Marshall Center prior to the

195
00:10:06,710 --> 00:10:04,499
April 21st explosion at Edwards

196
00:10:09,650 --> 00:10:06,720
propulsion system testing of the first

197
00:10:12,489 --> 00:10:09,660
f1 production engine continued with five

198
00:10:19,069 --> 00:10:12,499
firings for a total main stage time of

199
00:10:20,989 --> 00:10:19,079
196 seconds the second production engine

200
00:10:23,869 --> 00:10:20,999
was delivered to Marshall by Rocketdyne

201
00:10:26,210 --> 00:10:23,879
on April first quality lab completed its

202
00:10:28,249 --> 00:10:26,220
receiving inspection on April 14th and

203
00:10:30,199 --> 00:10:28,259
the engine was delivered to test lab

204
00:10:35,569 --> 00:10:30,209
where it is undergoing pre test

205
00:10:38,030 --> 00:10:35,579
preparation overall construction of the

206
00:10:40,549 --> 00:10:38,040
f1 engine static test standard Marshall

207
00:10:44,590 --> 00:10:40,559
has reached 80% completion with

208
00:10:47,840 --> 00:10:44,600
beneficial occupancy due next quarter

209
00:10:49,790 --> 00:10:47,850
rocky turns first j2 production engine

210
00:10:51,710 --> 00:10:49,800
was accepted by the Marshall Center this

211
00:10:53,900 --> 00:10:51,720
quarter the engine was turned over to

212
00:10:57,019 --> 00:10:53,910
Douglas Aircraft for use in captive

213
00:11:08,670 --> 00:10:57,029

tests associated with s4b battleship

214
00:11:13,950 --> 00:11:11,579
a series of engine system static tests

215
00:11:16,560 --> 00:11:13,960
was conducted during this report period

216
00:11:19,079 --> 00:11:16,570
to demonstrate full gimble capability as

217
00:11:21,090 --> 00:11:19,089
well as safety limits malfunction and

218
00:11:24,960 --> 00:11:21,100
full propellant utilization valve

219
00:11:27,630 --> 00:11:24,970
operation prior to entering PF RT the

220
00:11:29,550 --> 00:11:27,640
engine was gimballed twice to a seven

221
00:11:32,340 --> 00:11:29,560
degree limit in four different planes

222
00:11:34,740 --> 00:11:32,350
with three passes in each plane and to a

223
00:11:46,230 --> 00:11:34,750
10 degree gimble angle in the corners on

224
00:11:48,510 --> 00:11:46,240
another test a full-scale mock-up 260

225
00:11:50,160 --> 00:11:48,520
inches in diameter of the Saturn 5

226
00:11:52,290 --> 00:11:50,170
instrument unit was under construction

227
00:11:54,990 --> 00:11:52,300
at the Marshall Center during the report

228
00:11:57,360 --> 00:11:55,000
period to assist engineers improving out

229
00:11:59,340 --> 00:11:57,370
designs related to electrical cable

230
00:12:01,860 --> 00:11:59,350
length and routing instrument and

231
00:12:05,880 --> 00:12:01,870
bracket tree fittings and the IU cooling

232
00:12:09,199 --> 00:12:05,890
system the mock-up is now about 50%

233
00:12:13,260 --> 00:12:11,250
International Business Machines new

234
00:12:16,140 --> 00:12:13,270
facilities at Huntsville will be the

235
00:12:18,750 --> 00:12:16,150
site of Saturn 5 iu engineering and

236
00:12:21,300 --> 00:12:18,760
check-out work IBM was selected by NASA

237
00:12:24,920 --> 00:12:21,310
this quarter as lead contractor for

238
00:12:27,840 --> 00:12:24,930

development and fabrication of the IU

239
00:12:29,970 --> 00:12:27,850
the first computer and computer tester

240
00:12:32,160 --> 00:12:29,980
an early development model of the flight

241
00:12:34,560 --> 00:12:32,170
configuration equipment depicted in this

242
00:12:36,870 --> 00:12:34,570
artist's drawing was accepted this

243
00:12:45,000 --> 00:12:36,880
quarter from IBM for use in the IU

244
00:12:47,250 --> 00:12:45,010
breadboard construction of the Saturn 5

245
00:12:50,280 --> 00:12:47,260
dynamic test standard Marshall is now

246
00:12:54,030 --> 00:12:50,290
approximately 80% complete beneficial

247
00:12:56,370 --> 00:12:54,040
occupancy is scheduled in August at

248
00:12:58,769 --> 00:12:56,380
Marshall's Saturn 5 ground support

249
00:13:01,410 --> 00:12:58,779
equipment test facility depicted in this

250
00:13:03,269 --> 00:13:01,420
artist's drawing brick and mortar

251
00:13:05,190 --> 00:13:03,279
construction is approximately 35%

252
00:13:08,130 --> 00:13:05,200
finished the Technical Systems

253
00:13:09,900 --> 00:13:08,140
contractor is approximately 85% complete

254
00:13:12,300 --> 00:13:09,910
with all equipment scheduled for

255
00:13:14,310 --> 00:13:12,310
delivery by June installation of the

256
00:13:19,660 --> 00:13:14,320
Technical Systems is scheduled to start

257
00:13:24,960 --> 00:13:21,790
Mississippi test facility construction

258
00:13:28,360 --> 00:13:24,970
is continuing under three main complexes

259
00:13:30,850 --> 00:13:28,370
the test complex including excavation

260
00:13:34,810 --> 00:13:30,860
and foundation work on the s 1 C dual

261
00:13:38,980 --> 00:13:34,820
position static test and and the 2 s 2

262
00:13:41,200 --> 00:13:38,990
static test stands the laboratory and

263
00:13:43,030 --> 00:13:41,210

engineering complex which includes the

264
00:13:45,940 --> 00:13:43,040
office and administration building

265
00:13:50,080 --> 00:13:45,950
and the telephone and terminal building

266
00:13:52,060 --> 00:13:50,090
and the support services complex which

267
00:13:55,540 --> 00:13:52,070
encompasses such facilities as the

268
00:14:00,240 --> 00:13:55,550
emergency services building the MTF

269
00:14:04,210 --> 00:14:00,250
warehouse the site maintenance building

270
00:14:08,200 --> 00:14:04,220
the central heating plant and the

271
00:14:11,220 --> 00:14:08,210
electrical substation work also

272
00:14:17,430 --> 00:14:11,230
progressed steadily under various roads

273
00:14:20,320 --> 00:14:17,440
railway facilities river channels docks