1
00:00:21,320 --> 00:00:18,910
[Music]

2
00:00:24,440 --> 00:00:21,330
this is the first quarterly coal report

3
00:00:25,700 --> 00:00:24,450
on the Saturn C 5 designated by the

4
00:00:28,609 --> 00:00:25,710
National Aeronautics and Space

5
00:00:30,380 --> 00:00:28,619
Administration as the vehicle which will

6
00:00:32,450 --> 00:00:30,390
launch the Apollo spacecraft to

7
00:00:36,200 --> 00:00:32,460
accomplish circumlunar flight and manned

8
00:00:40,520 --> 00:00:36,210
lunar landings the Saturn C 5 booster or

9
00:00:42,139 --> 00:00:40,530
first stage identified as the s 1 C is

10
00:00:44,119 --> 00:00:42,149
now under joint development by the

11
00:00:47,720 --> 00:00:44,129
George C Marshall Space Flight Center

12
00:00:50,479 --> 00:00:47,730
and the Boeing Company it will have five

13
00:00:52,900 --> 00:00:50,489

f-1 engines producing the total thrust

14
00:00:55,310 --> 00:00:52,910
of seven and a half million pounds

15
00:01:01,599 --> 00:00:55,320
Rocketdyne division of North American

16
00:01:06,830 --> 00:01:04,640
the second stage s2 is under development

17
00:01:11,360 --> 00:01:06,840
by the space systems and information

18
00:01:13,969 --> 00:01:11,370
division of North American Aviation it's

19
00:01:16,780 --> 00:01:13,979
five G two engines using liquid hydrogen

20
00:01:19,940 --> 00:01:16,790
will generate 1 million pounds of thrust

21
00:01:27,280 --> 00:01:19,950
Rocketdyne is also contractor for the j2

22
00:01:32,090 --> 00:01:30,230
the third stage known as s4b

23
00:01:37,510 --> 00:01:32,100
is being developed by Douglas Aircraft

24
00:01:49,160 --> 00:01:37,520
Company it will use a single-engine j2

25
00:01:56,810 --> 00:01:52,399
designed to carry three men the Apollo

26
00:02:00,139 --> 00:01:56,820
spacecraft will ride atop the third

27
00:02:04,670 --> 00:02:00,149
stage to complete the Saturn C 5 space

28
00:02:06,649 --> 00:02:04,680
vehicle this report will highlight major

29
00:02:10,190 --> 00:02:06,659
facilities build-up activity for

30
00:02:15,920 --> 00:02:10,200
manufacture and testing of s1 c s2 and

31
00:02:18,110 --> 00:02:15,930
s4 b stages at the Marshall Space Flight

32
00:02:20,660 --> 00:02:18,120
Center where overall direction of the

33
00:02:23,479 --> 00:02:20,670
Saturn program emanates and where ground

34
00:02:26,270 --> 00:02:23,489
test s 1c stages will be assembled and

35
00:02:29,330 --> 00:02:26,280
tested some plant facilities are now

36
00:02:32,720 --> 00:02:29,340
being rapidly reoriented from the c1 to

37
00:02:34,490 --> 00:02:32,730
the c5 program for example entrances to

38
00:02:37,190 --> 00:02:34,500

the fabrication and assembly buildings

39
00:02:43,460 --> 00:02:37,200
had to be considerably enlarged to allow

40
00:02:45,110 --> 00:02:43,470
movement of the vehicle a new components

41
00:02:48,199 --> 00:02:45,120
transporter is being assembled at

42
00:02:50,509 --> 00:02:48,209
Marshall for use in moving various s1c

43
00:02:53,870 --> 00:02:50,519
parts such as bulkheads and tank

44
00:02:56,120 --> 00:02:53,880
sections from one area to another 32

45
00:02:58,610 --> 00:02:56,130
feet tall the transporter will carry its

46
00:03:05,300 --> 00:02:58,620
loads suspended from hooks on cables at

47
00:03:07,190 --> 00:03:05,310
each side adjacent to the fabrication

48
00:03:09,440 --> 00:03:07,200
area at Marshalls manufacturing

49
00:03:12,349 --> 00:03:09,450
engineering division construction has

50
00:03:14,810 --> 00:03:12,359
begun on an s-1 C combination vertical

51
00:03:18,470 --> 00:03:14,820
assembly station and hydrostatic test

52
00:03:20,360 --> 00:03:18,480
our the 160 foot tall structure will

53
00:03:24,979 --> 00:03:20,370
also be used for cleaning of finished

54
00:03:28,610 --> 00:03:24,989
tanks located near the present Saturn C

55
00:03:31,880 --> 00:03:28,620
1 dynamic test and will be a 360 foot

56
00:03:37,039 --> 00:03:31,890
high C 5 dynamic stand for which design

57
00:03:38,750 --> 00:03:37,049
work has been completed a dynamic test

58
00:03:41,059 --> 00:03:38,760
vehicle assembled at Marshall who will

59
00:03:43,039 --> 00:03:41,069
be suspended in the tower and vibrated

60
00:03:48,800 --> 00:03:43,049
to determine simulated in flight

61
00:03:51,199 --> 00:03:48,810
responses work is progressing on

62
00:03:54,039 --> 00:03:51,209
construction of the static test stand to

63
00:03:56,690 --> 00:03:54,049

be used for captive firing s1c stages

64
00:03:58,550 --> 00:03:56,700
work on the test and foundation and

65
00:04:01,270 --> 00:03:58,560
Control Centre has been underway for

66
00:04:06,190 --> 00:04:03,640
and a contract has been awarded for

67
00:04:08,740 --> 00:04:06,200
construction of the tower itself which

68
00:04:15,309 --> 00:04:08,750
will measure 160 feet square at the base

69
00:04:17,500 --> 00:04:15,319
and stand 405 feet high a contract for

70
00:04:20,289 --> 00:04:17,510
excavation and other preliminary work on

71
00:04:23,409 --> 00:04:20,299
Marshalls single f1 engine static test

72
00:04:25,840 --> 00:04:23,419
and has also been awarded and test and

73
00:04:30,820 --> 00:04:25,850
design has been completed the stand will

74
00:04:33,610 --> 00:04:30,830
be approximately 200 feet high to

75
00:04:35,830 --> 00:04:33,620
full-scale fiberglass mock-ups of s1c

76
00:04:37,810 --> 00:04:35,840
locks and fuel tank bulkheads have been

77
00:04:39,820 --> 00:04:37,820
received by the Marshall Center from

78
00:04:42,460 --> 00:04:39,830
Boeing company's plant at Wichita Kansas

79
00:04:44,700 --> 00:04:42,470
they will become part of the s 1c

80
00:04:47,320 --> 00:04:44,710
mock-up to be assembled at Marshall

81
00:04:50,170 --> 00:04:47,330
consisting of eight gore segments the

82
00:04:55,930 --> 00:04:50,180
bulkhead is 33 feet in diameter and 10

83
00:04:58,360 --> 00:04:55,940
feet high at the center bulkhead

84
00:05:00,400 --> 00:04:58,370
fabrication fixtures such as this device

85
00:05:02,740 --> 00:05:00,410
for cutting and welding gore fitting

86
00:05:05,020 --> 00:05:02,750
connections are now being installed at

87
00:05:07,390 --> 00:05:05,030
Marshall in preparation for fabrication

88
00:05:16,590 --> 00:05:07,400

work all the fixtures were provided by

89
00:05:21,630 --> 00:05:19,380
this Gore trim fixture trims the top

90
00:05:24,450 --> 00:05:21,640
edge of the base and the bottom edge of

91
00:05:26,870 --> 00:05:24,460
the apex of each Gore in order to make a

92
00:05:29,400 --> 00:05:26,880
joint to weld the two pieces together

93
00:05:31,920 --> 00:05:29,410
portable vacuum chucks or holding

94
00:05:40,800 --> 00:05:31,930
devices keep the Gore's in place while

95
00:05:43,110 --> 00:05:40,810
they're being trimmed and welded they

96
00:05:45,720 --> 00:05:43,120
send apex portions are joined on this

97
00:05:48,330 --> 00:05:45,730
Gore welding fixture it's welding

98
00:05:51,060 --> 00:05:48,340
platform is mounted over a pit and can

99
00:05:52,920 --> 00:05:51,070
be tilted 30 degrees making it possible

100
00:05:55,770 --> 00:05:52,930
to weld uphill at all times

101
00:05:57,840 --> 00:05:55,780
welding downward is undesirable because

102
00:06:00,120 --> 00:05:57,850
the weld will run off instead of

103
00:06:07,830 --> 00:06:00,130
puddling as is necessary to form a

104
00:06:10,110 --> 00:06:07,840
strong weld this meridian edge Gore trim

105
00:06:13,260 --> 00:06:10,120
fixture is used for trimming the Gore's

106
00:06:15,990 --> 00:06:13,270
lengthwise a large vacuum chuck from

107
00:06:21,330 --> 00:06:16,000
which air is evacuated by a pump holds

108
00:06:23,400 --> 00:06:21,340
the gore during trimming Gore's are then

109
00:06:25,680 --> 00:06:23,410
placed in this bulkhead assembly welding

110
00:06:28,440 --> 00:06:25,690
station where meridian wells are

111
00:06:30,660 --> 00:06:28,450
performed to join them together the

112
00:06:33,390 --> 00:06:30,670
process is repeated eight times to make

113
00:06:36,000 --> 00:06:33,400

a bulkhead assembly after each core is

114
00:06:39,180 --> 00:06:36,010
welded the turntable welding platform is

115
00:06:41,610 --> 00:06:39,190
rotated 45 degrees to position the next

116
00:06:49,410 --> 00:06:41,620
Gore for the weld head which remains in

117
00:06:52,380 --> 00:06:49,420
place this fixture is used to trim each

118
00:06:55,500 --> 00:06:52,390
bulkhead assembly to a 54 inch diameter

119
00:06:57,930 --> 00:06:55,510
opening at the top and then weld in the

120
00:07:04,380 --> 00:06:57,940
bulkhead closure piece to complete the

121
00:07:07,440 --> 00:07:04,390
bulkhead fabrication process at Wichita

122
00:07:09,510 --> 00:07:07,450
Boeing's 80-acre plant to area is the

123
00:07:13,550 --> 00:07:09,520
site of the company's program for Saturn

124
00:07:16,650 --> 00:07:13,560
c5 support tooling and fabrication work

125
00:07:19,020 --> 00:07:16,660
preliminary milling on c5 booster test

126
00:07:21,660 --> 00:07:19,030
panels was accomplished on these tape

127
00:07:23,820 --> 00:07:21,670
controls Kim Mills with working length

128
00:07:26,730 --> 00:07:23,830
and width of 90 feet and 12 feet

129
00:07:29,219 --> 00:07:26,740
respectively the same skinned mills will

130
00:07:30,450 --> 00:07:29,229
be used for pocket milling required on

131
00:07:32,999 --> 00:07:30,460
the tank and gorse

132
00:07:38,189 --> 00:07:33,009
segment and also for milling integrally

133
00:07:41,010 --> 00:07:38,199
stiffened tank skins fiberglass molds or

134
00:07:43,610 --> 00:07:41,020
layups are being formed here for the

135
00:07:46,559 --> 00:07:43,620
tank end Gore segment bulge form dies

136
00:07:48,990 --> 00:07:46,569
eight such segments will form the ends

137
00:07:53,159 --> 00:07:49,000
for fuel and blocks tanks for c5

138
00:07:56,490 --> 00:07:53,169

boosters the master form for the segment

139
00:07:57,089 --> 00:07:56,500
is fabricated of plaster others Saturn

140
00:08:00,330 --> 00:07:57,099
layups

141
00:08:02,730 --> 00:08:00,340
are made of fiberglass one such

142
00:08:08,010 --> 00:08:02,740
fiberglass mold is this base core

143
00:08:10,379 --> 00:08:08,020
segment welding on all tools to be used

144
00:08:13,200 --> 00:08:10,389
in Boeing's fabrication of parts for the

145
00:08:17,100 --> 00:08:13,210
Saturn c5 program is performed in the

146
00:08:18,900 --> 00:08:17,110
Boeing Wichita weld shop this section

147
00:08:21,629 --> 00:08:18,910
represents the framework for the base

148
00:08:27,330 --> 00:08:21,639
portion of the Bulge formed i-4 tank end

149
00:08:29,219 --> 00:08:27,340
Gore's wire feed welding equipment and

150
00:08:31,710 --> 00:08:29,229
other advanced fabrication techniques

151
00:08:37,440 --> 00:08:31,720
are employed in all areas of Saturn work

152
00:08:39,329 --> 00:08:37,450
at the Wichita facility at Marshall

153
00:08:41,639 --> 00:08:39,339
centers masuo operations in New Orleans

154
00:08:47,510 --> 00:08:41,649
the huge plant is being readied for

155
00:08:52,260 --> 00:08:50,400
when NASA occupied the former Army

156
00:08:54,449 --> 00:08:52,270
Ordnance plant its overhead

157
00:08:57,090 --> 00:08:54,459
superstructure used in manufacture of

158
00:09:00,620 --> 00:08:57,100
tank engines during World War two was

159
00:09:03,630 --> 00:09:00,630
too low for Saturn booster assembly

160
00:09:05,850 --> 00:09:03,640
plant renovation performed under

161
00:09:08,639 --> 00:09:05,860
contract by Mason rust company of New

162
00:09:11,010 --> 00:09:08,649
Orleans consisted largely of removal of

163
00:09:13,769 --> 00:09:11,020

the surplus overhead grillage such as

164
00:09:15,900 --> 00:09:13,779
rails cranes and heat ducts their

165
00:09:18,510 --> 00:09:15,910
removal now allows an overhead clearance

166
00:09:20,430 --> 00:09:18,520
of 40 feet which will provide 6 inches

167
00:09:26,090 --> 00:09:20,440
of clearance for the booster in the

168
00:09:30,480 --> 00:09:28,680
approximately 2,000 tons of steel were

169
00:09:32,760 --> 00:09:30,490
cut out of the overhead superstructure

170
00:09:38,430 --> 00:09:32,770
and hauled from the plant to be sold as

171
00:09:40,890 --> 00:09:38,440
scrap a 50-foot diameter hole had to be

172
00:09:43,199 --> 00:09:40,900
broken in the floor in preparation for a

173
00:09:44,370 --> 00:09:43,209
specially constructed foundation for

174
00:09:49,650 --> 00:09:44,380
Boeing's Massey

175
00:09:51,810 --> 00:09:49,660
100-ton boring mil a wooden retaining

176
00:09:54,210 --> 00:09:51,820
wall with steel spider reinforcement

177
00:09:59,550 --> 00:09:54,220
kept the sides of the 15-foot deep

178
00:10:01,410 --> 00:09:59,560
excavation from caving in the old piling

179
00:10:04,250 --> 00:10:01,420
on which the original floor was mounted

180
00:10:10,530 --> 00:10:04,260
was cut off at the bottom of the hole

181
00:10:13,230 --> 00:10:10,540
and augmented by an additional 116 new

182
00:10:16,860 --> 00:10:13,240
files which were driven 30 feet into the

183
00:10:19,170 --> 00:10:16,870
ground a concrete cap was then poured on

184
00:10:25,110 --> 00:10:19,180
the files and the foundation built up

185
00:10:27,330 --> 00:10:25,120
with concrete and reinforced steel the

186
00:10:29,400 --> 00:10:27,340
boring mill was shipped to masu on eight

187
00:10:35,450 --> 00:10:29,410
flat cars from the Army's Detroit

188
00:10:39,330 --> 00:10:37,470

steam cleaning of the mill was

189
00:10:45,720 --> 00:10:39,340
accomplished after its delivery to the

190
00:10:48,360 --> 00:10:45,730
mature plant emplacement of the mill on

191
00:10:50,460 --> 00:10:48,370
its foundation required extreme care to

192
00:10:54,030 --> 00:10:50,470
ensure proper meshing of gear systems

193
00:10:56,670 --> 00:10:54,040
the turntable weighing over 70 tons was

194
00:10:58,740 --> 00:10:56,680
not large enough for Saturn's needs so

195
00:11:00,720 --> 00:10:58,750
extensions were manufactured to increase

196
00:11:05,070 --> 00:11:00,730
the diameter by approximately twelve

197
00:11:07,980 --> 00:11:05,080
feet at Ingalls shipyard in Pascagoula

198
00:11:11,700 --> 00:11:07,990
Mississippi rolling of aluminum ingots

199
00:11:14,670 --> 00:11:11,710
for wiring segments of s1c stages was

200
00:11:16,650 --> 00:11:14,680
recently performed for Boeing why Rings

201
00:11:22,050 --> 00:11:16,660
will be used to connect bulkheads to

202
00:11:24,630 --> 00:11:22,060
fuel and blocks tank skins in order to

203
00:11:27,090 --> 00:11:24,640
check for cracks dye penetrant tests

204
00:11:29,880 --> 00:11:27,100
were performed on ingots before during

205
00:11:33,380 --> 00:11:29,890
and after the rolling operation ingots

206
00:11:36,480 --> 00:11:33,390
measured 5 inches thick and 34 feet long

207
00:11:38,340 --> 00:11:36,490
the desired final radius of 16 and a

208
00:11:40,830 --> 00:11:38,350
half feet was obtained by rolling a

209
00:11:43,680 --> 00:11:40,840
little at a time and checking it by hand

210
00:11:45,720 --> 00:11:43,690
with a plywood template during rolling

211
00:11:48,180 --> 00:11:45,730
smooth metal collars were placed on the

212
00:11:52,660 --> 00:11:48,190
heavy hydraulically operated rollers to

213
00:12:01,300 --> 00:11:59,200

a test ingot after its normal rolling

214
00:12:03,580 --> 00:12:01,310
operation had been accomplished was

215
00:12:07,270 --> 00:12:03,590
replaced in the rollers and then rolled

216
00:12:09,880 --> 00:12:07,280
beyond 360 degrees in a checkout attempt

217
00:12:15,100 --> 00:12:09,890
to break the ingot even at this extreme

218
00:12:17,050 --> 00:12:15,110
over bend however no breaks occurred the

219
00:12:18,970 --> 00:12:17,060
ends of normally rolled segments were

220
00:12:21,610 --> 00:12:18,980
machined at the shipyard to an

221
00:12:23,470 --> 00:12:21,620
approximate V point when the three

222
00:12:25,930 --> 00:12:23,480
segments which formed the wiring are

223
00:12:29,110 --> 00:12:25,940
placed together for welding the points

224
00:12:31,390 --> 00:12:29,120
of the V's touch and the open V's formed

225
00:12:33,850 --> 00:12:31,400
both inside and outside the ring surface

226
00:12:43,450 --> 00:12:33,860
are filled with metal to form strong

227
00:12:45,750 --> 00:12:43,460
heavy welds from the center out in an

228
00:12:48,040 --> 00:12:45,760
interim weld facility set up at masu

229
00:12:50,290 --> 00:12:48,050
welders were trained to operate the

230
00:12:56,170 --> 00:12:50,300
automatic machines used to make the Wai

231
00:12:58,360 --> 00:12:56,180
ring Wells sonic and x-ray testing of

232
00:13:03,520 --> 00:12:58,370
Wells was conducted to discover any

233
00:13:05,530 --> 00:13:03,530
flaws or cracks the first actual wiring

234
00:13:07,810 --> 00:13:05,540
weld was performed in Boeing's

235
00:13:10,240 --> 00:13:07,820
production weld facility in December

236
00:13:14,700 --> 00:13:10,250
using personnel and equipment formerly

237
00:13:20,350 --> 00:13:17,710
the boring mill at masu was put to its

238
00:13:22,690 --> 00:13:20,360

initial use in a test operation to

239
00:13:25,900 --> 00:13:22,700
machine the first wiring segments to

240
00:13:27,880 --> 00:13:25,910
finish dimensions one segment was cut

241
00:13:30,040 --> 00:13:27,890
into small sections for test pieces

242
00:13:32,560 --> 00:13:30,050
which will be used for experimental

243
00:13:35,140 --> 00:13:32,570
welding to determine if the wiring can

244
00:13:38,080 --> 00:13:35,150
be welded after it is machined rather

245
00:13:39,670 --> 00:13:38,090
than before following the tests the

246
00:13:42,190 --> 00:13:39,680
three segments will be welded together

247
00:13:50,000 --> 00:13:42,200
to determine the feasibility of welding

248
00:13:54,150 --> 00:13:52,200
construction of the foundation for the

249
00:13:58,380 --> 00:13:54,160
new vertical Assembly Building at massú

250
00:14:00,990 --> 00:13:58,390
is now well underway the building will

251
00:14:03,750 --> 00:14:01,000
have three tank assembly areas one

252
00:14:08,640 --> 00:14:03,760
chemical tank test area and one stage

253
00:14:11,070 --> 00:14:08,650
vertical assembly area at Rocketdyne

254
00:14:13,620 --> 00:14:11,080
where Saturn's f1 engines are being

255
00:14:15,930 --> 00:14:13,630
developed inspection of the engines

256
00:14:18,480 --> 00:14:15,940
modified sixteen to one thrust chamber

257
00:14:21,030 --> 00:14:18,490
extension skirt after its first short

258
00:14:23,070 --> 00:14:21,040
duration firing showed that collapsing

259
00:14:27,840 --> 00:14:23,080
and longitudinal buckling have been

260
00:14:30,570 --> 00:14:27,850
eliminated in this design a new exhaust

261
00:14:33,420 --> 00:14:30,580
manifold now being employed on the f1 is

262
00:14:35,850 --> 00:14:33,430
smaller and more circular in shape than

263
00:14:38,460 --> 00:14:35,860

the previous design this configuration

264
00:14:40,620 --> 00:14:38,470
is intended to reduce the axial loading

265
00:14:42,750 --> 00:14:40,630
on the skirt support flange which

266
00:14:49,170 --> 00:14:42,760
results in membrane stresses in the

267
00:14:51,900 --> 00:14:49,180
manifold shell rocket dines new model

268
00:14:55,020 --> 00:14:51,910
one LOX pump has been undergoing tests

269
00:14:57,210 --> 00:14:55,030
at Santa Susana in this test setup a

270
00:14:59,780 --> 00:14:57,220
pipe is connected to the top of the pump

271
00:15:02,520 --> 00:14:59,790
permitting testing with a direct flow

272
00:15:04,080 --> 00:15:02,530
pump performance is then compared with

273
00:15:05,850 --> 00:15:04,090
performance when the pump is flowed

274
00:15:13,440 --> 00:15:05,860
through the normal inlets in the elbows

275
00:15:15,570 --> 00:15:13,450
the f1 heat exchanger designed to

276
00:15:17,940 --> 00:15:15,580
provide pressurization for the LOX and

277
00:15:20,070 --> 00:15:17,950
fuel tanks has been tested a number of

278
00:15:26,310 --> 00:15:20,080
times at components test lab number

279
00:15:28,890 --> 00:15:26,320
three several injector designs such as

280
00:15:30,600 --> 00:15:28,900
this LOX dispersion injector have been

281
00:15:34,620 --> 00:15:30,610
tested in an effort to increase

282
00:15:36,990 --> 00:15:34,630
combustion stability margins other

283
00:15:40,500 --> 00:15:37,000
designs tested include the baffled

284
00:15:44,340 --> 00:15:40,510
divergent ring injector low fuel Delta P

285
00:15:49,680 --> 00:15:44,350
injector 21 compartment baffled injector

286
00:15:52,320 --> 00:15:49,690
and the divergent ring injector as part

287
00:15:53,820 --> 00:15:52,330
of the LOX dome oscillation study tests

288
00:15:56,160 --> 00:15:53,830

have been conducted on rocket dean's

289
00:15:58,770 --> 00:15:56,170
high flow test bench at varying

290
00:16:02,340 --> 00:15:58,780
pressures this data will be evaluated

291
00:16:05,070 --> 00:16:02,350
and compared with data from hot testing

292
00:16:07,320 --> 00:16:05,080
a full-scale f1 engine mock-up has been

293
00:16:09,390 --> 00:16:07,330
delivered by Rocketdyne to the Marshall

294
00:16:12,240 --> 00:16:09,400
Center where it was mounted vertically

295
00:16:14,580 --> 00:16:12,250
for tests and a gimbal expand later

296
00:16:23,070 --> 00:16:14,590
it'll be mounted in a partial mock-up of

297
00:16:25,320 --> 00:16:23,080
the s1 see thrust structure final

298
00:16:26,940 --> 00:16:25,330
assembly of saturn s2 stages will be

299
00:16:29,670 --> 00:16:26,950
accomplished at the new Seal Beach

300
00:16:32,300 --> 00:16:29,680
California facility of North Americans

301
00:16:35,580 --> 00:16:32,310
space and Information Systems Division

302
00:16:37,620 --> 00:16:35,590
construction began in August s and I D

303
00:16:39,750 --> 00:16:37,630
personnel occupied a portion of the

304
00:16:41,910 --> 00:16:39,760
facility's bulkhead fabrication building

305
00:16:46,710 --> 00:16:41,920
in December to coordinate tooling

306
00:16:48,210 --> 00:16:46,720
installation this one 248 scale model of

307
00:16:50,250 --> 00:16:48,220
the seal Beach vertical assembly

308
00:16:53,970 --> 00:16:50,260
facility is being used to evaluate

309
00:16:56,100 --> 00:16:53,980
proposed s2 assembly sequences and to

310
00:16:58,710 --> 00:16:56,110
check integration of tools facilities

311
00:17:03,270 --> 00:16:58,720
material handling devices and booster

312
00:17:05,460 --> 00:17:03,280
components production tooling for use at

313
00:17:08,580 --> 00:17:05,470

seal Beach an assembly and welding of s2

314
00:17:11,460 --> 00:17:08,590
bulkheads is now being fabricated at s

315
00:17:16,010 --> 00:17:11,470
and IDs Downey plant delivery of weld

316
00:17:20,670 --> 00:17:18,450
construction of s and ID's el Toro

317
00:17:23,040 --> 00:17:20,680
facility for high energy forming of

318
00:17:25,410 --> 00:17:23,050
bulkhead gora segments and high energy

319
00:17:29,280 --> 00:17:25,420
sizing of bulkheads has been virtually

320
00:17:31,290 --> 00:17:29,290
completed a master mold for bulkhead

321
00:17:34,170 --> 00:17:31,300
gore segment tooling has been used at

322
00:17:36,840 --> 00:17:34,180
Downey to form a master facility tool an

323
00:17:39,120 --> 00:17:36,850
over pressed template and soft tooling

324
00:17:43,710 --> 00:17:39,130
for the high energy forming program at

325
00:17:46,110 --> 00:17:43,720
El Toro high energy forming dyes are

326
00:17:49,560 --> 00:17:46,120
being machined from rough formed steel

327
00:17:51,930 --> 00:17:49,570
using scape machining techniques these

328
00:17:54,480 --> 00:17:51,940
dies due to their size shape and weight

329
00:17:57,270 --> 00:17:54,490
could not be machined by conventional

330
00:17:58,920 --> 00:17:57,280
methods in February the forming dyes

331
00:18:04,850 --> 00:17:58,930
will be delivered to the El Toro

332
00:18:09,660 --> 00:18:07,320
another major construction activity

333
00:18:12,210 --> 00:18:09,670
under way for the s2 program is

334
00:18:15,850 --> 00:18:12,220
preparation for a new static test end

335
00:18:17,950 --> 00:18:15,860
called cooker for at Santa Susana

336
00:18:25,779 --> 00:18:17,960
the coca one test and is also being

337
00:18:27,630 --> 00:18:25,789
modified for s2 1/4 scale s2 test tank

338
00:18:30,370 --> 00:18:27,640

has recently been fabricated and

339
00:18:32,230 --> 00:18:30,380
hydrostatically tested at Downey to

340
00:18:36,909 --> 00:18:32,240
prove the design integrity of the

341
00:18:39,070 --> 00:18:36,919
insulation system 1/4 scale working

342
00:18:42,220 --> 00:18:39,080
model of one of the 3 umbilical arms

343
00:18:47,620 --> 00:18:42,230
required to service the s2 stage has

344
00:18:50,259 --> 00:18:47,630
also been completed Cornell aeronautical

345
00:18:52,840 --> 00:18:50,269
laboratory in Buffalo New York has

346
00:18:56,080 --> 00:18:52,850
concluded a series of tests for s and ID

347
00:18:58,090 --> 00:18:56,090
to determine the s2 s base environment

348
00:19:00,700 --> 00:18:58,100
in terms of temperature heating rates

349
00:19:02,529 --> 00:19:00,710
and pressure distribution and to

350
00:19:05,649 --> 00:19:02,539
establish the optimum deflector and

351
00:19:09,159 --> 00:19:05,659
shrouding arrangement for the stages 5j

352
00:19:10,779 --> 00:19:09,169
two engines using a 125th scale model

353
00:19:12,909 --> 00:19:10,789
tests were conducted at a pressure

354
00:19:18,370 --> 00:19:12,919
equivalent to an altitude of 240

355
00:19:20,320 --> 00:19:18,380
thousand feet at Douglas Aircraft

356
00:19:22,779 --> 00:19:20,330
Company where design development

357
00:19:25,870 --> 00:19:22,789
fabrication and testing of the Saturn C

358
00:19:28,690 --> 00:19:25,880
fives third stage s 4 B will be

359
00:19:30,820 --> 00:19:28,700
accomplished structural layout drawings

360
00:19:34,090 --> 00:19:30,830
being prepared by Douglas are nearing

361
00:19:37,330 --> 00:19:34,100
completion and work is underway on

362
00:19:39,669 --> 00:19:37,340
detailed stage structural drawings at

363
00:19:42,340 --> 00:19:39,679

Douglas Sacramento test area where

364
00:19:46,060 --> 00:19:42,350
static tests of the Saturn C one's s4

365
00:19:48,669 --> 00:19:46,070
stage are conducted a new facility for

366
00:19:51,279 --> 00:19:48,679
ground testing of the larger s4 B stage

367
00:19:55,299 --> 00:19:51,289
is being planned the complex will

368
00:19:57,669 --> 00:19:55,309
include static test stands a blockhouse

369
00:20:01,450 --> 00:19:57,679
propellant and high-pressure gas systems

370
00:20:04,060 --> 00:20:01,460
and supporting utilities at Rocketdyne

371
00:20:06,639 --> 00:20:04,070
Santa Susana area buildup of test

372
00:20:11,289 --> 00:20:06,649
facilities continues for the j2 engine

373
00:20:15,149 --> 00:20:11,299
common to s2 and s4 b stages vertical

374
00:20:18,549 --> 00:20:15,159
test and number two is almost complete

375
00:20:21,370 --> 00:20:18,559
at Delta test and number two which will

376
00:20:24,210 --> 00:20:21,380
be used for 500 second runs outside

377
00:20:26,919 --> 00:20:24,220
lakhs run tanks are in place and

378
00:20:28,840 --> 00:20:26,929
fabrication of the 90,000 gallon liquid

379
00:20:29,410 --> 00:20:28,850
hydrogen run vessel is virtually

380
00:20:35,740 --> 00:20:29,420
finished

381
00:20:38,950 --> 00:20:35,750
a hard mock-up of the block 3j2 engine

382
00:20:40,930 --> 00:20:38,960
has recently been completed oriented to

383
00:20:45,430 --> 00:20:40,940
vehicle requirements it represents the

384
00:20:46,180 --> 00:20:45,440
initial flight readiness engine since

385
00:20:48,670 --> 00:20:46,190
the j2 s

386
00:20:52,150 --> 00:20:48,680
first long-duration static test on

387
00:20:54,310 --> 00:20:52,160
October 4th 1962 in which the engine

388
00:20:57,100 --> 00:20:54,320

fired for more than four minutes at full

389
00:21:05,299 --> 00:20:57,110
thrust a number of similar tests have

390
00:21:11,820 --> 00:21:08,400
Saturn c5 vehicles will be launched from

391
00:21:13,650 --> 00:21:11,830
complex 39 in the new NASA area for

392
00:21:18,870 --> 00:21:13,660
which land has been acquired north of

393
00:21:21,480 --> 00:21:18,880
cape canaveral complex 39 covering

394
00:21:24,299 --> 00:21:21,490
30,000 acres and containing two or more

395
00:21:28,350 --> 00:21:24,309
launch pads will embody a new concept in

396
00:21:30,690 --> 00:21:28,360
launch facilities Saturn vehicles will

397
00:21:32,910 --> 00:21:30,700
be completely erected and checked out in

398
00:21:34,890 --> 00:21:32,920
a 48 story tall vertical Assembly

399
00:21:41,520 --> 00:21:34,900
Building about three miles from the

400
00:21:44,700 --> 00:21:41,530
launch site the building will contain

401
00:21:46,799 --> 00:21:44,710
four bays in each of which a Saturn can

402
00:21:49,350 --> 00:21:46,809
be erected mated to the Apollo

403
00:21:52,110 --> 00:21:49,360
spacecraft and check out on a launch

404
00:21:57,600 --> 00:21:52,120
rack which also supports its 400 foot

405
00:21:59,190 --> 00:21:57,610
umbilical Tower the launch ready Saturn

406
00:22:02,370 --> 00:21:59,200
will then be transported to the

407
00:22:08,070 --> 00:22:02,380
launching pad by means of a 2,500 tonne

408
00:22:10,410 --> 00:22:08,080
crawler vehicle at the pad the 20-foot

409
00:22:12,900 --> 00:22:10,420
high crawler will employ its hydraulic

410
00:22:25,960 --> 00:22:12,910
cylinders to lower the rack and vehicle

411
00:22:31,490 --> 00:22:29,060
launching of the Saturn c5 from Cape

412
00:22:34,009 --> 00:22:31,500
Canaveral will be a giant step in the

413
00:22:37,159 --> 00:22:34,019

lunar orbital rendezvous procedure which

414
00:22:42,790 --> 00:22:37,169
has been chosen by NASA as prime mission