1
00:00:13,109 --> 00:00:10,489
[Music]

2
00:00:14,699 --> 00:00:13,119
three heavy space vehicles are being

3
00:00:18,120 --> 00:00:14,709
developed by the National Aeronautics

4
00:00:22,439 --> 00:00:18,130
and Space Administration under the

5
00:00:24,450 --> 00:00:22,449
project name Saturn the first

6
00:00:27,990 --> 00:00:24,460
configuration known as Saturn one

7
00:00:32,459 --> 00:00:28,000
consists of a booster called

8
00:00:36,350 --> 00:00:32,469
s1 with eight h1 engines plus an s4

9
00:00:40,680 --> 00:00:36,360
stage the instrument unit and payload a

10
00:00:45,900 --> 00:00:40,690
second configuration Saturn 1b consists

11
00:00:48,120 --> 00:00:45,910
of a s 1d first stage plus an s4 B upper

12
00:00:53,430 --> 00:00:48,130
stage an instrument unit in Apollo

13
00:00:55,889 --> 00:00:53,440

spacecraft this film report number 15

14
00:00:58,319 --> 00:00:55,899
we'll cover progress on the Saturn 1 and

15
00:01:05,219 --> 00:00:58,329
1b during the period January through

16
00:01:07,139 --> 00:01:05,229
March 1963 slight changes in the names

17
00:01:09,510 --> 00:01:07,149
of Saturn vehicles were announced by

18
00:01:12,240 --> 00:01:09,520
NASA during this quarter in the interest

19
00:01:15,989 --> 00:01:12,250
of simplification new designations for

20
00:01:23,309 --> 00:01:15,999
the Saturn C 1 C 1 B and C 5 are now

21
00:01:26,010 --> 00:01:23,319
Saturn 1 1 P and 5 respectively the

22
00:01:27,929 --> 00:01:26,020
fourth Saturn one flight vehicle sa 4

23
00:01:30,209 --> 00:01:27,939
was shipped from Marshall Space Flight

24
00:01:32,819 --> 00:01:30,219
Center aboard the Saturn barge promise

25
00:01:35,069 --> 00:01:32,829
On January 20th bound for Cape Canaveral

26
00:01:37,319 --> 00:01:35,079
and route the barge encountered heavy

27
00:01:45,239 --> 00:01:37,329
seas in the Gulf and tied up briefly at

28
00:01:49,379 --> 00:01:45,249
Fort Pierce Florida it arrived at the

29
00:01:53,929 --> 00:01:49,389
Cape on February 2nd and was erected on

30
00:01:58,949 --> 00:01:56,249
highlighting this report period on March

31
00:02:01,830 --> 00:01:58,959
28th was the successful launching from

32
00:02:07,469 --> 00:02:01,840
complex 34 at Cape Canaveral of the 4th

33
00:02:09,389 --> 00:02:07,479
Saturn 1 launch vehicle sa for several

34
00:02:11,490 --> 00:02:09,399
minor technical difficulties during the

35
00:02:13,620 --> 00:02:11,500
countdown mostly in ground support

36
00:02:18,780 --> 00:02:13,630
equipment delayed the firing about one

37
00:02:18,790 --> 00:02:41,640
[Music]

38
00:02:46,830 --> 00:02:44,490

while the SI for flight shown in slow

39
00:02:48,630 --> 00:02:46,840
motion was similar in many respects to

40
00:02:51,509 --> 00:02:48,640
that of earlier saturn's there were

41
00:02:53,940 --> 00:02:51,519
several significant departures at 100

42
00:02:56,339 --> 00:02:53,950
seconds following liftoff and to number

43
00:02:57,899 --> 00:02:56,349
five was deliberately cut off but the

44
00:03:00,179 --> 00:02:57,909
vehicle held on course

45
00:03:02,099 --> 00:03:00,189
while the propellant distribution system

46
00:03:04,710 --> 00:03:02,109
channelled the remaining fuel into the

47
00:03:07,020 --> 00:03:04,720
other seven engines extending burning

48
00:03:09,569 --> 00:03:07,030
time two seconds to compensate for loss

49
00:03:11,339 --> 00:03:09,579
of thrust several other changes in the

50
00:03:13,289 --> 00:03:11,349
vehicle will contribute to the

51
00:03:15,509 --> 00:03:13,299
development of the block ii version of

52
00:03:17,640 --> 00:03:15,519
saturn some components of future

53
00:03:20,280 --> 00:03:17,650
saturn's were attached to the unit ii

54
00:03:23,460 --> 00:03:20,290
state control accelerometers were used

55
00:03:25,289 --> 00:03:23,470
actively for the first time flawless a

56
00:03:28,379 --> 00:03:25,299
passenger was the engineering model of

57
00:03:30,210 --> 00:03:28,389
the st 1:24 stabilized platform which

58
00:03:34,229 --> 00:03:30,220
will be used actively beginning with the

59
00:03:36,960 --> 00:03:34,239
6th Saturn a mistress tomando was also

60
00:03:38,970 --> 00:03:36,970
flown on a passenger basis a q-ball

61
00:03:41,399 --> 00:03:38,980
angle-of-attack device was mounted in

62
00:03:43,619 --> 00:03:41,409
the nose cone and several sections of

63
00:03:46,530 --> 00:03:43,629

new heat shield insulation at the tail

64
00:03:49,890 --> 00:03:46,540
section were tested si for reached

65
00:03:53,479 --> 00:03:49,900
maximum altitude of 81 miles range of

66
00:04:04,220 --> 00:03:53,489
232 statute miles and a peak velocity of

67
00:04:10,319 --> 00:04:07,619
meanwhile at Marshall 3 static firings

68
00:04:13,500 --> 00:04:10,329
of the booster 4 v Saturn flight vehicle

69
00:04:16,140 --> 00:04:13,510
si 5 were conducted the first for 32

70
00:04:18,539 --> 00:04:16,150
seconds was successful the second firing

71
00:04:19,409 --> 00:04:18,549
was conducted for a period of 143

72
00:04:21,870 --> 00:04:19,419
seconds

73
00:04:24,629 --> 00:04:21,880
however propulsion system deficiencies

74
00:04:27,839 --> 00:04:24,639
appeared in data analysis and corrective

75
00:04:30,960 --> 00:04:27,849
action was taken on March 27th a third

76
00:04:33,390 --> 00:04:30,970
firing of 144 seconds was successfully

77
00:04:39,059 --> 00:04:33,400
performed results indicated that the

78
00:04:43,600 --> 00:04:41,679
more than 1,000 measurements of

79
00:04:46,059 --> 00:04:43,610
propellant flow rates temperatures

80
00:04:50,379 --> 00:04:46,069
vibration levels and other data were

81
00:04:52,990 --> 00:04:50,389
recorded during the firing the SI 5

82
00:04:55,029 --> 00:04:53,000
booster first in the block 2 series is

83
00:04:57,760 --> 00:04:55,039
the initial flight booster to be static

84
00:05:06,520 --> 00:04:57,770
fired at full thrust of 1.5 million

85
00:05:09,879 --> 00:05:06,530
pounds dynamics testing of the complete

86
00:05:11,950 --> 00:05:09,889
block to vehicle sa D 5 began at

87
00:05:15,939 --> 00:05:11,960
Marshall in January and was completed

88
00:05:18,459 --> 00:05:15,949

early in March next quarter dynamics

89
00:05:22,270 --> 00:05:18,469
tests will begin using Saturn one upper

90
00:05:24,520 --> 00:05:22,280
stage and boilerplate Apollo as the

91
00:05:26,800 --> 00:05:24,530
Saturn hangs on giant cables and coil

92
00:05:30,189 --> 00:05:26,810
springs it is put through paces which

93
00:05:32,350 --> 00:05:30,199
simulate flight conditions as the

94
00:05:35,490 --> 00:05:32,360
vehicle dents rhythmically or vibrates

95
00:05:38,140 --> 00:05:35,500
driven by a large electrical device

96
00:05:42,249 --> 00:05:38,150
stress measurements are taken at vital

97
00:05:44,290 --> 00:05:42,259
points all over the vehicle results of

98
00:05:47,050 --> 00:05:44,300
testing are fed into an analog digital

99
00:05:49,749 --> 00:05:47,060
computer which changes data into digital

100
00:05:51,399 --> 00:05:49,759
numbers on magnetic tape the tape is

101
00:05:57,450 --> 00:05:51,409
then run through another computer which

102
00:06:02,230 --> 00:06:00,369
following first phase testing the

103
00:06:04,689 --> 00:06:02,240
booster was removed from the test stand

104
00:06:07,930 --> 00:06:04,699
and will be shipped to the Cape in April

105
00:06:10,540 --> 00:06:07,940
for use in launch complex 37b check out

106
00:06:18,820 --> 00:06:10,550
complete vehicle testing will be resumed

107
00:06:21,850 --> 00:06:18,830
in June at Marshalls propulsion and

108
00:06:24,100 --> 00:06:21,860
vehicle engineering division and si5

109
00:06:26,619 --> 00:06:24,110
type instrument unit was mounted for

110
00:06:28,629 --> 00:06:26,629
structural testing between a douglas

111
00:06:30,999 --> 00:06:28,639
built forward inter stage and a

112
00:06:34,059 --> 00:06:31,009
spacecraft adapter simulating flight

113
00:06:36,399 --> 00:06:34,069

hardware flight loads incorporating

114
00:06:38,559 --> 00:06:36,409
adequate safety factors are applied to

115
00:06:41,079 --> 00:06:38,569
assure proper structural performance in

116
00:06:43,749 --> 00:06:41,089
actual flight these flight loads consist

117
00:06:46,120 --> 00:06:43,759
of aerodynamic inertial and internal

118
00:06:47,709 --> 00:06:46,130
pressure loads stress is produced in

119
00:06:50,719 --> 00:06:47,719
this structure are measured at several

120
00:06:52,309 --> 00:06:50,729
hundred points and recorded for analysis

121
00:06:59,209 --> 00:06:52,319
duplicate of this instrument unit will

122
00:07:01,790 --> 00:06:59,219
be flown on si five testing of the new

123
00:07:04,309 --> 00:07:01,800
combination support and hold on arms for

124
00:07:05,689 --> 00:07:04,319
block to launch pedestals began at

125
00:07:07,939 --> 00:07:05,699
Marshall this quarter

126
00:07:11,269 --> 00:07:07,949
the first set was delivered to complex

127
00:07:13,100 --> 00:07:11,279
37b in January testing of a second set

128
00:07:15,589 --> 00:07:13,110
was suspended when cracks were

129
00:07:18,379 --> 00:07:15,599
discovered on the upper part of five arm

130
00:07:21,230 --> 00:07:18,389
castings recheck of the set in complex

131
00:07:30,649 --> 00:07:21,240
37b and a third set of arms under

132
00:07:33,049 --> 00:07:30,659
fabrication showed no defects the SI

133
00:07:35,719 --> 00:07:33,059
five booster mock-up was shipped by

134
00:07:37,939 --> 00:07:35,729
barge on january 25th from the Marshall

135
00:07:43,969 --> 00:07:37,949
Center to its miss you operations at New

136
00:07:46,459 --> 00:07:43,979
Orleans there the mock-up will be used

137
00:07:49,159 --> 00:07:46,469
by engineers in design verification and

138
00:07:53,420 --> 00:07:49,169

to familiarize assembly personnel with

139
00:07:56,239 --> 00:07:53,430
the block 2 configuration the booster

140
00:07:58,639 --> 00:07:56,249
for the 6th Saturn one flight vehicle sa

141
00:08:00,649 --> 00:07:58,649
6 was completed this quarter at

142
00:08:03,559 --> 00:08:00,659
Marshalls manufacturing engineering

143
00:08:05,749 --> 00:08:03,569
division several vendor supplied parts

144
00:08:08,089 --> 00:08:05,759
not available during assembly are being

145
00:08:11,749 --> 00:08:08,099
installed during checkout which is to be

146
00:08:13,999 --> 00:08:11,759
completed in early April assembly of the

147
00:08:17,689 --> 00:08:14,009
booster for the 7 Saturn flight vehicle

148
00:08:19,219 --> 00:08:17,699
sa 7 begun on January 7th preceded this

149
00:08:20,929 --> 00:08:19,229
quarter with clustering of tanks

150
00:08:27,499 --> 00:08:20,939
completed an installation of engines

151
00:08:29,749 --> 00:08:27,509
underway meanwhile fabrication of the

152
00:08:33,079 --> 00:08:29,759
booster thrust structure and inter stage

153
00:08:39,829 --> 00:08:33,089
adapter for SI 9 the ninth Saturn flight

154
00:08:42,800 --> 00:08:39,839
vehicle is complete for SI 9 and sa 8 a

155
00:08:44,209 --> 00:08:42,810
2-ton meteoroid detection satellite is

156
00:08:48,639 --> 00:08:44,219
being developed by the third child

157
00:08:53,660 --> 00:08:51,470
during launch the satellite will be

158
00:08:55,639 --> 00:08:53,670
housed in the service module flight

159
00:08:57,620 --> 00:08:55,649
experiment results will provide a better

160
00:09:01,370 --> 00:08:57,630
understanding of meteoroid hazards

161
00:09:03,079 --> 00:09:01,380
encountered in spaceflight after

162
00:09:04,690 --> 00:09:03,089
injection and separation of the

163
00:09:06,910 --> 00:09:04,700

boilerplate spacecraft

164
00:09:09,880 --> 00:09:06,920
the satellite remains attached to the s

165
00:09:11,800 --> 00:09:09,890
for stage and deploys to large flat

166
00:09:14,860 --> 00:09:11,810
wings ten feet wide

167
00:09:17,200 --> 00:09:14,870
with a total wingspan of 96 feet by a

168
00:09:23,230 --> 00:09:17,210
system of scissor like links driven by

169
00:09:25,060 --> 00:09:23,240
an electric motor the wings will be

170
00:09:28,180 --> 00:09:25,070
covered with sheets of aluminum are

171
00:09:30,700 --> 00:09:28,190
varying thicknesses up to 16 one

172
00:09:32,740 --> 00:09:30,710
thousandths of an inch the back surface

173
00:09:35,140 --> 00:09:32,750
of the sheet is covered with a thin

174
00:09:37,090 --> 00:09:35,150
layer of mylar and its back surface

175
00:09:48,100 --> 00:09:37,100
coated with a thin layer of paper

176
00:09:49,660 --> 00:09:48,110
deposited aluminum an electric potential

177
00:09:52,270 --> 00:09:49,670
is established between the outer skin

178
00:09:54,370 --> 00:09:52,280
and the inner aluminum coating charging

179
00:09:59,320 --> 00:09:54,380
the entire unit making it a huge

180
00:10:01,750 --> 00:09:59,330
capacitor each time the wings are

181
00:10:04,240 --> 00:10:01,760
penetrated by a meteoroid the material

182
00:10:06,700 --> 00:10:04,250
removed by the impact vaporizes and

183
00:10:10,330 --> 00:10:06,710
forms a conducting gas which discharges

184
00:10:12,280 --> 00:10:10,340
the capacitor the pulse is stored in a

185
00:10:13,840 --> 00:10:12,290
memory circuit and transmitted to a

186
00:10:16,510 --> 00:10:13,850
ground station on command

187
00:10:23,730 --> 00:10:16,520
solar panels supply needed energy for

188
00:10:26,800 --> 00:10:23,740

power at Marshall's Michou operations

189
00:10:28,960 --> 00:10:26,810
s18 tail section assembly was completed

190
00:10:33,820 --> 00:10:28,970
this quarter assembly operations will

191
00:10:35,920 --> 00:10:33,830
begin in May meanwhile s110 barrel

192
00:10:37,600 --> 00:10:35,930
assembly has been completed and the

193
00:10:43,050 --> 00:10:37,610
outriggers and remainder of the tail

194
00:10:45,820 --> 00:10:43,060
structure are being assembled on

195
00:10:49,000 --> 00:10:45,830
February 5th a decision was made to

196
00:10:51,700 --> 00:10:49,010
modify the west side extension of the s1

197
00:10:54,580 --> 00:10:51,710
static test tower originally designed to

198
00:10:57,360 --> 00:10:54,590
test s1 boosters the extension will be

199
00:10:59,800 --> 00:10:57,370
slightly modified to test f-1 engines

200
00:11:01,870 --> 00:10:59,810
enabling testing to take place several

201
00:11:04,720 --> 00:11:01,880
months earlier after completion of

202
00:11:07,270 --> 00:11:04,730
Marshalls f1 test stand the west side

203
00:11:14,770 --> 00:11:07,280
will be reconverted for s1 static

204
00:11:17,470 --> 00:11:14,780
testing radiation pattern testing of

205
00:11:18,519 --> 00:11:17,480
various saturn antenna is being carried

206
00:11:21,489 --> 00:11:18,529
out at Marshall's

207
00:11:24,369 --> 00:11:21,499
frequency test range this service

208
00:11:26,410 --> 00:11:24,379
structure rolls on rails is propelled by

209
00:11:29,050 --> 00:11:26,420
an electric motor and is easily

210
00:11:30,759 --> 00:11:29,060
maneuvered by one man its purpose is to

211
00:11:32,769 --> 00:11:30,769
afford access to the model for

212
00:11:35,530 --> 00:11:32,779
positioning adjusting or making

213
00:11:37,689 --> 00:11:35,540

modifications the facility is used to

214
00:11:40,660 --> 00:11:37,699
measure and record the directional

215
00:11:42,489 --> 00:11:40,670
properties of the vehicle's antenna the

216
00:11:44,590 --> 00:11:42,499
pedestal mounted model is rotated

217
00:11:46,269 --> 00:11:44,600
continuously during the time that a

218
00:11:48,309 --> 00:11:46,279
radio frequency signal is being

219
00:11:50,739 --> 00:11:48,319
transmitted to a receiver at a fixed

220
00:11:53,710 --> 00:11:50,749
location the varying amplitude of this

221
00:11:58,809 --> 00:11:53,720
signal is recorded at a console located

222
00:12:01,660 --> 00:11:58,819
in an adjacent building at Marshall's

223
00:12:03,939 --> 00:12:01,670
Astri onyx division Saturn booster h1

224
00:12:06,639 --> 00:12:03,949
engines are being tested on the h1

225
00:12:08,920 --> 00:12:06,649
engine Col calibration tests stand

226
00:12:11,819 --> 00:12:08,930
enabling engineers to simulate actual

227
00:12:14,889 --> 00:12:11,829
flight conditions of Saturn's s1 stage

228
00:12:17,079 --> 00:12:14,899
the hydraulic actuation control system

229
00:12:20,100 --> 00:12:17,089
positions the engine to the angle

230
00:12:22,749 --> 00:12:20,110
commanded by the vehicle guidance system

231
00:12:25,449 --> 00:12:22,759
this positioning is necessary for

232
00:12:27,970 --> 00:12:25,459
attitude control in the pitch yaw and

233
00:12:32,860 --> 00:12:27,980
roll planes stabilization and to reduce

234
00:12:34,869 --> 00:12:32,870
bending of the vehicle test results will

235
00:12:36,879 --> 00:12:34,879
help determine if the flight control

236
00:12:39,040 --> 00:12:36,889
circuits and mechanical power converters

237
00:12:42,990 --> 00:12:39,050
are adequate to satisfy vehicle

238
00:12:47,769 --> 00:12:46,749

the s4 facilities checkout stage was

239
00:12:50,470 --> 00:12:47,779
shipped from the Douglas Aircraft

240
00:12:52,840 --> 00:12:50,480
Company Santa Monica California to Cape

241
00:12:54,579 --> 00:12:52,850
Canaveral early this quarter the stage

242
00:13:02,160 --> 00:12:54,589
is ready for youths in check out of

243
00:13:05,559 --> 00:13:02,170
facilities at launch complex 37b on

244
00:13:07,900 --> 00:13:05,569
February 1st the all systems vehicle was

245
00:13:10,090 --> 00:13:07,910
shipped by water and overland route to

246
00:13:12,490 --> 00:13:10,100
the Sacramento test facility for

247
00:13:15,730 --> 00:13:12,500
propellant loading tests on test stand

248
00:13:17,350 --> 00:13:15,740
to be after initial testing the vehicle

249
00:13:20,319 --> 00:13:17,360
will be removed from the stand and

250
00:13:26,650 --> 00:13:20,329
equipped with rl10 a3 engines for

251
00:13:31,840 --> 00:13:29,199
at sacked os4 battleship testing with

252
00:13:34,240 --> 00:13:31,850
flight type rl10 a three engines began

253
00:13:36,639 --> 00:13:34,250
in January during this report period

254
00:13:38,710 --> 00:13:36,649
seven firings were performed four

255
00:13:41,460 --> 00:13:38,720
successful in three partially successful

256
00:13:43,509 --> 00:13:41,470
for a total of about 2,000 seconds

257
00:13:45,519 --> 00:13:43,519
difficulties were encountered during

258
00:13:48,519 --> 00:13:45,529
February with helium heater ignition

259
00:13:50,800 --> 00:13:48,529
engine purging and small fires resulting

260
00:13:53,199 --> 00:13:50,810
from hydrogen leaks after correction of

261
00:13:55,420 --> 00:13:53,209
these deficiencies in March a series of

262
00:13:58,269 --> 00:13:55,430
three successful procurement depletion

263
00:14:00,759 --> 00:13:58,279

firings of over 460 seconds duration

264
00:14:02,379 --> 00:14:00,769
were performed due to these problems

265
00:14:08,710 --> 00:14:02,389
the battleship firings have been

266
00:14:11,170 --> 00:14:08,720
extended through April checkout of a new

267
00:14:13,420 --> 00:14:11,180
test stand designated v6 has been

268
00:14:14,860 --> 00:14:13,430
completed this corner at Pratt & Whitney

269
00:14:17,499 --> 00:14:14,870
aircrafts for the research and

270
00:14:18,970 --> 00:14:17,509
development center the stand is designed

271
00:14:20,949 --> 00:14:18,980
to permit both transient and

272
00:14:27,840 --> 00:14:20,959
steady-state tests of turbo pumps

273
00:14:32,199 --> 00:14:30,550
liquid hydrogen and liquid oxygen can be

274
00:14:34,240 --> 00:14:32,209
supplied to the turbo pump and

275
00:14:36,910 --> 00:14:34,250
high-pressure gas storage is available

276
00:14:43,050 --> 00:14:36,920
to drive the turbine test results are

277
00:14:48,540 --> 00:14:45,340
vibration tests were performed on the

278
00:14:51,040 --> 00:14:48,550
latest version of the rl10 a3 engine

279
00:14:53,920 --> 00:14:51,050
instrumentation for these tests included

280
00:14:58,679 --> 00:14:53,930
40 accelerometers plus load cells at the

281
00:15:03,759 --> 00:15:01,449
the tests were conducted with vehicle

282
00:15:08,530 --> 00:15:03,769
equipment including the hydraulic pump

283
00:15:11,079 --> 00:15:08,540
installed on the engine the engine was

284
00:15:12,670 --> 00:15:11,089
vibrated in axial and lateral planes two

285
00:15:15,069 --> 00:15:12,680
levels appreciably above those

286
00:15:17,170 --> 00:15:15,079
encountered in Saturn flights no

287
00:15:21,249 --> 00:15:17,180
structural weakness has been discovered

288
00:15:24,400 --> 00:15:21,259

in these tests at douglas santa monica a

289
00:15:26,650 --> 00:15:24,410
full-scale s4b engineering mock-up will

290
00:15:28,600 --> 00:15:26,660
be used to verify flight type system

291
00:15:33,610 --> 00:15:28,610
compatibility with ground support

292
00:15:35,799 --> 00:15:33,620
equipment both tank domes are now

293
00:15:38,530 --> 00:15:35,809
complete and are installed in handling

294
00:15:40,210 --> 00:15:38,540
jigs the forward interstate structure is

295
00:15:47,760 --> 00:15:40,220
attached to the forward dome

296
00:15:52,150 --> 00:15:49,810
fabrication of a number of production

297
00:15:53,860 --> 00:15:52,160
tooling fixtures and manufacturing of

298
00:15:59,200 --> 00:15:53,870
the first hydrostatic vehicle is

299
00:16:02,080 --> 00:15:59,210
underway the testing program for the s4b

300
00:16:04,630 --> 00:16:02,090
vehicle includes research development

301
00:16:09,850 --> 00:16:04,640
qualification production and reliability

302
00:16:12,490 --> 00:16:09,860
verification testing the design concept

303
00:16:15,220 --> 00:16:12,500
for the Saturn 1b instrument unit which

304
00:16:17,710 --> 00:16:15,230
will be located between the s4b stage

305
00:16:19,510 --> 00:16:17,720
and the Apollo spacecraft has been

306
00:16:21,700 --> 00:16:19,520
established by the Marshall Center and

307
00:16:26,050 --> 00:16:21,710
detailed design work has begun on

308
00:16:27,880 --> 00:16:26,060
several components all equipment will be

309
00:16:30,580 --> 00:16:27,890
mounted around the periphery of the unit

310
00:16:37,000 --> 00:16:30,590
which is three feet high and 21 feet

311
00:16:39,070 --> 00:16:37,010
eight inches in diameter circulation of

312
00:16:40,990 --> 00:16:39,080
a coolant through panels to which

313
00:16:42,910 --> 00:16:41,000

equipment is mounted will provide

314
00:16:46,090 --> 00:16:42,920
temperature control for the instrument

315
00:16:49,210 --> 00:16:46,100
unit as well as four adjacent s4p stage

316
00:16:51,940 --> 00:16:49,220
equipment the instrument unit will house

317
00:16:54,820 --> 00:16:51,950
the major guidance and control tracking

318
00:16:56,830 --> 00:16:54,830
and telemetry systems the unused volume

319
00:16:59,320 --> 00:16:56,840
in the centre will allow the legs of the

320
00:17:01,510 --> 00:16:59,330
Apollo's lunar excursion module to

321
00:17:07,870 --> 00:17:01,520
extend into the unit thus making the

322
00:17:11,020 --> 00:17:07,880
total Saturn 1b vehicle shorter at

323
00:17:14,200 --> 00:17:11,030
Rocketdyne contractor for the j2 engine

324
00:17:16,570 --> 00:17:14,210
for the s4b stage a relatively new

325
00:17:19,690 --> 00:17:16,580
manufacturing technique in metal forming

326
00:17:23,560 --> 00:17:19,700
called electrolytic erosion is underway

327
00:17:26,260 --> 00:17:23,570
for production of j2 injectors this

328
00:17:28,510 --> 00:17:26,270
concept uses a forming die made of

329
00:17:32,410 --> 00:17:28,520
compressed graphite which in turn acts

330
00:17:34,690 --> 00:17:32,420
as an electrode as the erosion process

331
00:17:37,810 --> 00:17:34,700
reacts against the metal to be formed a

332
00:17:43,600 --> 00:17:37,820
non conductive oil removes the eroded

333
00:17:45,880 --> 00:17:43,610
material to planned tolerances at Cape

334
00:17:49,150 --> 00:17:45,890
Canaveral work on Saturn launch sites is

335
00:17:51,370 --> 00:17:49,160
progressing as planned launch complex 34

336
00:17:54,130 --> 00:17:51,380
s umbilical tower is near completion

337
00:17:57,789 --> 00:17:54,140
meanwhile overall construction of