
IBM
TV

1
00:00:18,600 --> 00:00:24,090
Saturn launch vehicle film report number 38
covers progress of the Saturn IB and Saturn

2
00:00:24,090 --> 00:00:36,800
V Programs during the period October, November,
and December 1968.

3
00:00:36,800 --> 00:00:42,430
As this quarter began, final high bay checkout
was underway in Kennedy Space Center's Vertical

4
00:00:42,430 --> 00:00:49,080
Assembly Building on AS-503, the third Saturn
V flight vehicle, and the one whose destiny

5
00:00:49,080 --> 00:00:56,820
would be to launch three astronauts on mankind's
most awesome journey to the Moon.

6
00:00:56,820 --> 00:01:02,589
On October 9, the 503 vehicle, mated to the
Apollo 8 spacecraft which would house astronauts

7
00:01:02,589 --> 00:01:08,110
Frank Borman, James Lovell, and William Anders,
was slowly moved aboard its mobile launcher

8
00:01:08,110 --> 00:01:13,240
the three miles for the VAB to Pad A, Launch
Complex 39.

9
00:01:13,240 --> 00:01:19,230
Here, the painstaking final preparations and
checkouts were performed during the following

10
00:01:19,230 --> 00:01:25,250
weeks to ready AS-503 for its historic mission
of propelling its Apollo 8 spacecraft to the

11
00:01:25,250 --> 00:01:27,509
first lunar orbit.

12
00:01:27,509 --> 00:01:31,500
The six day prelaunch countdown began on December
15.

13
00:01:31,500 --> 00:01:36,430
It proceeded with only minor problems, which
were resolved without impact on the scheduled

14
00:01:36,430 --> 00:01:37,430
launch date.

15
00:01:37,430 --> 00:01:44,859
At T minus twenty-eight hours, the actual
countdown commenced.

16
00:01:44,859 --> 00:01:51,620
At 6:51 AM Central Standard Time, only milliseconds
off schedule, on Saturday, December 21, the

17
00:01:51,620 --> 00:01:57,579
elliptical Apollo 8 flight began, its five
F-1 engines generating a total of seven and

18
00:01:57,579 --> 00:01:59,140
a half million pounds of thrust.

19
00:01:59,140 --> 00:02:03,310
The vehicle’s first, of S-IC stage, performed
perfectly.

20
00:02:03,310 --> 00:02:10,009
The S-IC boosted the vehicle forty-two miles
at a speed of 6,068 miles per hour.

21
00:02:10,009 --> 00:02:15,950
Performance of the S-IC’s pogo suppression

system was nominal, and indications are that

22
00:02:15,950 --> 00:02:20,260
no pogo, or excessive longitudinal oscillations,
existed.

23
00:02:20,260 --> 00:02:28,250
S-IC, S-II stage separation occurred at 154.5
seconds after liftoff, only 2.4 seconds beyond

24
00:02:28,250 --> 00:02:31,970
predicted time.

25
00:02:31,970 --> 00:02:36,390
Performance of the second, of S-II, stage
was also very satisfactory and well within

26
00:02:36,390 --> 00:02:37,390
tolerance.

27
00:02:37,390 --> 00:02:43,290
Powered by its five J-2 engines, the S-II
stage burned for six minutes and nine seconds

28
00:02:43,290 --> 00:02:48,810
before cutoff and separation from the S-IVB
stage.

29
00:02:48,810 --> 00:02:54,470
The third, or S-IVB, stage was started at
525 seconds into the flight and inserted the

30
00:02:54,470 --> 00:02:58,900
Apollo spacecraft into a parking orbit around
the Earth.

31
00:02:58,900 --> 00:03:03,190
After coasting for two hours and thirty-nine
minutes, the stage was reignited to place

32
00:03:03,190 --> 00:03:07,030
Apollo into translunar injection.

33
00:03:07,030 --> 00:03:10,870
Performance of the vehicle's instrument
unit was extremely accurate both in the Earth

34
00:03:10,870 --> 00:03:16,790
orbital injection and the translunar injection
phases.

35
00:03:16,790 --> 00:03:23,140
Reaching the Moon after its 230,000 mile journey,
Apollo 8 passed within seventy miles of the

36
00:03:23,140 --> 00:03:28,340
lunar surface during the spacecraft's ten
lunar orbits.

37
00:03:28,340 --> 00:03:34,690
After some twenty hours in lunar orbit, Apollo
8 began its return trip to Earth.

38
00:03:34,690 --> 00:03:40,300
Reentering Earth's atmosphere at 25,000
miles per hour, Apollo 8 splashed down safely

39
00:03:40,300 --> 00:03:45,930
on target in the Pacific Ocean near Hawaii.

40
00:03:45,930 --> 00:03:53,120
With the historic AS-503 flight accomplished,
AS-504, the fourth Saturn V flight vehicle,

41
00:03:53,120 --> 00:03:55,830
now becomes the most immediate center of attention.

42
00:03:55,830 --> 00:04:02,850
Erection of the AS-504 in the VAB was performed

in early October and checkout and testing

43
00:04:02,850 --> 00:04:06,790
have been proceeding without any delay to
the launch schedule.

44
00:04:06,790 --> 00:04:09,960
Rollout to the launch pad is set for early
January.

45
00:04:09,960 --> 00:04:17,229
AS-504 is scheduled to launch the Apollo 9
spacecraft on February 28 for a low Earth

46
00:04:17,229 --> 00:04:24,800
orbital mission involving the first manned
operation of the Apollo’s lunar module.

47
00:04:24,800 --> 00:04:31,180
All stages for the fifth Saturn V flight vehicle,
AS-505, arrived at KSC this quarter from the

48
00:04:31,180 --> 00:04:32,509
prime contractors.

49
00:04:32,509 --> 00:04:41,121
The S-IC stage was delivered November 30,
the S-II stage arrived on December 10, the

50
00:04:41,121 --> 00:04:47,730
S-IVB stage on December 3, and the instrument
unit on December 14.

51
00:04:47,730 --> 00:04:51,840
Stacking of the AS-505 vehicle is due in early
January.

52
00:04:51,840 --> 00:05:01,400
-505 is tentatively scheduled to launch Apollo
10 on a circumlunar mission in mid-May 1969.

53
00:05:01,400 --> 00:05:06,340
Saturn V stage contractors were active during
the report period in testing stages for future

54
00:05:06,340 --> 00:05:07,940
launch vehicles.

55
00:05:07,940 --> 00:05:14,600
At NASA's Mississippi Test Facility, static
firing tests of S-IC stages 7 and 8 were successfully

56
00:05:14,600 --> 00:05:18,410
conducted by Boeing.

57
00:05:18,410 --> 00:05:24,430
Also at MTF, static firing of S-II-6 was conducted
in October by North American Rockwell Space

58
00:05:24,430 --> 00:05:30,930
Division, and post-static checkout and modifications
have been completed, S-II-7 has been installed

59
00:05:30,930 --> 00:05:38,710
in MTF's other S-II stand, and preparations
are underway for a mid-January firing.

60
00:05:38,710 --> 00:05:43,960
At the Sacramento, California facility of
McDonnell Douglas, S-IVB-7 was static tested

61
00:05:43,960 --> 00:05:45,820
in October.

62
00:05:45,820 --> 00:05:48,680
Post-static checkout and mods are now finished.

63
00:05:48,680 --> 00:05:54,360
Preparations are being made for static firing

of S-IVB-8 next quarter.

64
00:05:54,360 --> 00:05:59,980
A solution to corrosion problems encountered
under the new S-II stage spray foam insulation

65
00:05:59,980 --> 00:06:04,020
is now being applied at the contractor's
Seal Beach, California facility.

66
00:06:04,020 --> 00:06:09,630
The problem had been isolated to the primer
used on the aluminum prior to spray foam application.

67
00:06:09,630 --> 00:06:14,620
The old primer is being removed and a new
type primer, which provides more effective

68
00:06:14,620 --> 00:06:19,280
corrosion protection, will replace it.

69
00:06:19,280 --> 00:06:24,000
In the three part S-II Stage Light Weight
Structural Test Program, final testing of

70
00:06:24,000 --> 00:06:28,970
the A structure at the Marshall Center was
successfully completed in November at 130

71
00:06:28,970 --> 00:06:32,300
percent of limit load.

72
00:06:32,300 --> 00:06:36,860
The S-II light weight B test structure was
virtually demolished by an explosion during

73
00:06:36,860 --> 00:06:41,720
preparation for a test on December 20 at Santa
Susana, California.

74
00:06:41,720 --> 00:06:46,139
Cause of the blast was determined to be an
inadequate purge of liquid oxygen from the

75
00:06:46,139 --> 00:06:48,650
tank prior to start of testing.

76
00:06:48,650 --> 00:06:53,770
The test was to simulate S-II load conditions
at S-IC stage cutoff.

77
00:06:53,770 --> 00:06:57,130
The destroyed test item is not expected to
be replaced.

78
00:06:57,130 --> 00:07:02,120
It is believed that extrapolation of data
from other tests will provide adequate analysis

79
00:07:02,120 --> 00:07:03,170
of the test condition.

80
00:07:03,170 --> 00:07:11,669
On November 19, the S-II cutoff test condition
had been successfully conducted.

81
00:07:11,669 --> 00:07:15,240
Testing of the C structure was successfully
completed at the Marshall Center during the

82
00:07:15,240 --> 00:07:21,280
quarter, final tests indicating the structure
would sustain a 110 percent limit load without

83
00:07:21,280 --> 00:07:24,270
failure.

84
00:07:24,270 --> 00:07:29,670
At the Huntsville facility of the Saturn V

instrument unit contractor, IBM, installation

85
00:07:29,670 --> 00:07:35,400
of modification kits and retest operations
continued on various IUs throughout the report

86
00:07:35,400 --> 00:07:49,270
period.

87
00:07:49,270 --> 00:07:56,169
The fifth Saturn IB flight vehicle, designated
AS-205, was launched on October 11 from Launch

88
00:07:56,169 --> 00:08:02,960
Complex 34 of the Kennedy Space Center, placing
the first manned Apollo spacecraft, Apollo

89
00:08:02,960 --> 00:08:05,290
7, into Earth orbit.

90
00:08:05,290 --> 00:08:12,270
AS-205 performed flawlessly as it lifted astronauts
Walter Schirra, Don Eisele, and Walter Cunningham

91
00:08:12,270 --> 00:08:16,300
to what would be an almost eleven day stay
in space.

92
00:08:16,300 --> 00:08:20,900
The vehicle’s first, or S-IB, stage’s
propulsion and mechanical systems operated

93
00:08:20,900 --> 00:08:25,630
very satisfactorily, within .12 percent of
performance values.

94
00:08:25,630 --> 00:08:31,260
This included the fuel pressurization, liquid
oxygen pressurization, control pressure, and

95
00:08:31,260 --> 00:08:32,900
engine systems.

96
00:08:32,900 --> 00:08:39,510
Stage separation occurred at 145.5 seconds
after liftoff, only about one second beyond

97
00:08:39,510 --> 00:08:43,330
predicted time.

98
00:08:43,330 --> 00:08:48,140
Performance of the second, or S-IVB, stage
and associated systems was also perfect.

99
00:08:48,140 --> 00:08:53,330
S-IVB burn time was 470 seconds, within one
second of nominal.

100
00:08:53,330 --> 00:08:58,600
The instrument unit's guidance and control
systems performed with extreme precision.

101
00:08:58,600 --> 00:09:06,449
Apollo 7 was inserted into an orbit of 173.6
miles apogee and 137.9 miles perigee.

102
00:09:06,449 --> 00:09:11,350
All launch vehicle mission objectives were
accomplished, including a valuation of the

103
00:09:11,350 --> 00:09:17,170
J-2 engine augmented spark ignitor line modification.

104
00:09:17,170 --> 00:09:21,790
With its fifth successful flight in as many
launches, the Saturn IB launch vehicle has

105
00:09:21,790 --> 00:09:24,350
now completed its mission in Project Apollo.

106
00:09:24,350 --> 00:09:29,569
The nine remaining vehicles of the fourteen
ordered by NASA will now be placed in storage

107
00:09:29,569 --> 00:09:34,270
until the beginning of the Apollo Applications
Program flights in 1971.

108
00:09:34,270 --> 00:09:40,290
Their separate components, either complete
in assembly or undergoing modification, will

109
00:09:40,290 --> 00:09:48,769
be stored and kept in readiness by their respective
manufacturers until reactivated for AAP.

110
00:09:48,769 --> 00:09:54,350
Seven of the nine S-IB stages have been completed
and assembly is in progress on the last two

111
00:09:54,350 --> 00:09:59,709
by the Chrysler Corporation’s Space Division
at NASA’s Michoud Assembly Facility in New

112
00:09:59,709 --> 00:10:02,939
Orleans.

113
00:10:02,939 --> 00:10:08,050
Storage of seven completed S-IVB stages for
Saturn IB vehicles is being accomplished by

114
00:10:08,050 --> 00:10:15,500
the prime contractor, McDonnell Douglas, at
its Sacramento, California facility.

115
00:10:15,500 --> 00:10:19,410
The final two stages will be completed by
working them into the Saturn V production

116
00:10:19,410 --> 00:10:21,860
schedule as an economy measure.

117
00:10:21,860 --> 00:10:26,889
S-IVB is common to both launch vehicles.

118
00:10:26,889 --> 00:10:31,369
All but two of the Saturn IB instrument units
have been completed and are being stored by

119
00:10:31,369 --> 00:10:32,369
IBM, Huntsville.

120
00:10:32,369 --> 00:10:39,089
The remaining units will be worked into the
Saturn V assembly schedule.

121
00:10:39,089 --> 00:10:43,209
Maintenance of all stored Saturn IB vehicle
components for the resumption of launches

122
00:10:43,209 --> 00:10:47,639
for AAP will be required for all prime contractors.

123
00:10:47,639 --> 00:10:51,670
Systems are being developed for keeping the
stages in controlled environments to prevent

124
00:10:51,670 --> 00:10:53,829
any possible deterioration.

125
00:10:53,829 --> 00:11:01,550
In summation, the report period October, November,
December 1968 witnessed the culmination of

126
00:11:01,550 --> 00:11:07,970
years of effort in its two historic milestones,
the launching of the first manned Apollo spacecraft