1
00:00:14,799 --> 00:00:18,880
Welcome to the Marshall Space Flight Center.

2
00:00:18,880 --> 00:00:23,869
We want you to see some of the facilities
of our center and some of the work we are

3
00:00:23,869 --> 00:00:27,649
performing in the National Space Program.

4
00:00:27,649 --> 00:00:32,970
This center is a part of the National Aeronautics
and Space Administration.

5
00:00:32,970 --> 00:00:39,900
NASA is the federal agency responsible for
carrying forward the peaceful exploration

6
00:00:39,900 --> 00:00:45,489
of outer space to enhance man’s understanding
of the universe.

7
00:00:45,489 --> 00:00:51,650
Our special task in Huntsville is to develop
the rocket-powered systems necessary to propel

8
00:00:51,650 --> 00:00:57,460
scientific experiments from Earth’s surface
into the vastness of space.

9
00:00:57,460 --> 00:01:02,660
We design, assemble, test, and launch the
vehicles.

10
00:01:02,660 --> 00:01:07,710
You might say we are the long distance movers.

11
00:01:07,710 --> 00:01:15,229
The National Aeronautics and Space Administration,

with Headquarters in Washington, D.C., was

12
00:01:15,229 --> 00:01:22,410
established by an act of Congress on September 30, 1958 as an independent agency reporting

13
00:01:22,410 --> 00:01:24,690
directly to the president.

14
00:01:24,690 --> 00:01:34,350
The NASA mission is the development of the National Civilian Space Program.

15
00:01:34,350 --> 00:01:39,110
To accomplish this challenging task, many research centers and space flight centers

16
00:01:39,110 --> 00:01:43,180
throughout the country comprise this civilian organization.

17
00:01:43,180 --> 00:01:48,820
One of these, the George C. Marshall Space Flight Center, located at Huntsville, Alabama,

18
00:01:48,820 --> 00:01:53,300
is responsible for providing the rockets for NASA programs.

19
00:01:53,300 --> 00:02:00,259
The Marshall Center also supervises research and development in such fields as space guidance

20
00:02:00,259 --> 00:02:04,410
systems and advanced propulsion systems.

21
00:02:04,410 --> 00:02:10,560
The Marshall Center covers 1,500 acres of Alabama land.

22
00:02:10,560 --> 00:02:16,890
Here are organizational divisions the specialize
in all aspects of space transportation systems.

23
00:02:16,890 --> 00:02:24,210
Dr. Wernher von Braun directs the Marshall
Center team of more than 5,500 scientists,

24
00:02:24,210 --> 00:02:29,850
engineers, technicians, and support personnel
who have already written part of U.S. space

25
00:02:29,850 --> 00:02:30,990
history.

26
00:02:30,990 --> 00:02:36,100
A self-contained organization operates the
center, Dr. von Braun, as a deputy director

27
00:02:36,100 --> 00:02:40,530
for research and development and a deputy
director for administration.

28
00:02:40,530 --> 00:02:49,460
There’s a Public Information Office and
a Reliability Office.

29
00:02:49,460 --> 00:02:55,150
The Legal Office and the Industrial Relations
Office to conduct staff operations.

30
00:02:55,150 --> 00:03:01,790
There is a Financial Management Office,

31
00:03:01,790 --> 00:03:06,760
and a Management Service Office,

32
00:03:06,760 --> 00:03:11,800
a Procurement and Contracts Office,

33
00:03:11,800 --> 00:03:16,070
a Technical Services Office,

34
00:03:16,070 --> 00:03:21,290
an Operations Analysis Office,

35
00:03:21,290 --> 00:03:27,870
and also an NASA Resident Auditor's Office.

36
00:03:27,870 --> 00:03:33,430
These staff elements carry out the principal
support functions for the entire center.

37
00:03:33,430 --> 00:03:39,790
Project offices include a Saturn Systems Office,

38
00:03:39,790 --> 00:03:45,520
the Agena and Centaur Systems Office,

39
00:03:45,520 --> 00:03:49,840
the Weapons Systems Office,

40
00:03:49,840 --> 00:03:51,959
and the Future Projects Office.

41
00:03:51,959 --> 00:03:57,190
Also, there is a Technical Program Coordination
Office.

42
00:03:57,190 --> 00:04:03,540
Then, there are nine major operational divisions
that carry on the creative scientific and

43
00:04:03,540 --> 00:04:06,850
engineering work.

44
00:04:06,850 --> 00:04:11,720

The Aeroballistics Division investigates the
flight characteristics and trajectories of

45
00:04:11,720 --> 00:04:13,190
space vehicles.

46
00:04:13,190 --> 00:04:18,989
It operates a wind tunnel that tests new rocket
and space vehicle configurations.

47
00:04:18,989 --> 00:04:25,690
Elsewhere in Aeroballistics, physicists, mathematicians,
and other scientists develop optimum designs

48
00:04:25,690 --> 00:04:34,599
for spacecraft and flight plans for space
missions.

49
00:04:34,599 --> 00:04:40,669
The Structures and Mechanics Division must
translate ideas into practical designs.

50
00:04:40,669 --> 00:04:46,099
The division conducts research and development
work in chemistry, rubber, plastics, metals,

51
00:04:46,099 --> 00:04:47,849
and other materials.

52
00:04:47,849 --> 00:04:53,560
It investigates the structural stress and
strains to which the giant rockets are subjected.

53
00:04:53,560 --> 00:04:59,479
Studies are likewise conducted on rocket propellant
systems and mechanical components.

54
00:04:59,479 --> 00:05:04,919
The Computation Division operates electronic
brains that reduce data from test firings

55
00:05:04,919 --> 00:05:06,509
and from spacecraft.

56
00:05:06,509 --> 00:05:13,210
New designs are reduced to mathematical equations,
fed into the giant computers, and tested thoroughly

57
00:05:13,210 --> 00:05:15,630
before any hardware is assembled.

58
00:05:15,630 --> 00:05:21,169
Additionally, the computers compile budget
data, statistics, and inventory information

59
00:05:21,169 --> 00:05:26,289
useful to management.

60
00:05:26,289 --> 00:05:31,589
To ensure that the space vehicle's perform
as designed, the Quality Division conducts

61
00:05:31,589 --> 00:05:37,129
an exhaustive inspection program at every
stage in the development, assembly, and testing

62
00:05:37,129 --> 00:05:38,259
of the rockets.

63
00:05:38,259 --> 00:05:46,490
The division has its experts checking and
rechecking for any possible difficulties.

64
00:05:46,490 --> 00:05:51,860
Huge space vehicles are fabricated and assembled
in the enormous hangers in the Fabrication

65
00:05:51,860 --> 00:05:54,240
and Assembly Engineering Division.

66
00:05:54,240 --> 00:05:58,569
Here, metal is formed, components and power plants installed.

67
00:05:58,569 --> 00:06:05,030
The primary job at this time is the Saturn booster, the 1,500,000 thrust eight engine

68
00:06:05,030 --> 00:06:09,729
cluster that will power the largest space vehicles of the United states for the next

69
00:06:09,729 --> 00:06:11,240
several years.

70
00:06:11,240 --> 00:06:23,180
This division also perfects the tooling essential for industrial production of space rockets.

71
00:06:23,180 --> 00:06:28,479
The Guidance and Control Division must develop the guidance and control systems that steer

72
00:06:28,479 --> 00:06:33,650
the huge rockets on their flight paths and keep spacecraft on course for flights into

73
00:06:33,650 --> 00:06:36,279
Earth orbit or to the near planets.

74
00:06:36,279 --> 00:06:41,969
Tracking, measuring, and telemetry instruments and electrical networks for space vehicles

75
00:06:41,969 --> 00:06:45,069
are developed here.

76
00:06:45,069 --> 00:06:51,379

The Test Division operates the 178 foot Static
Test Tower where the big rockets are secured

77
00:06:51,379 --> 00:06:54,900
and fired to check all of their operating
systems.

78
00:06:54,900 --> 00:06:59,559
From and single test firing of the Saturn
booster, the division obtains more than 900

79
00:06:59,559 --> 00:07:01,240
channels of data.

80
00:07:01,240 --> 00:07:07,039
In this new Dynamic Test Tower, the Saturn
will be assembled and subjected to various

81
00:07:07,039 --> 00:07:12,539
mechanical, structural, and operational tests.

82
00:07:12,539 --> 00:07:16,169
Test Division also operates a power plant
test stand,

83
00:07:16,169 --> 00:07:20,879
a cold calibration stand,

84
00:07:20,879 --> 00:07:26,949
and a component test building to perform experimental
and developmental tests on vehicle components

85
00:07:26,949 --> 00:07:32,869
and ground equipment such as turbines, pumps,
gas generators, exhaust nozzles, and many

86
00:07:32,869 --> 00:07:34,669
smaller components.

87

00:07:34,669 --> 00:07:40,939
To the Research Projects Division is assigned responsibility for keeping the entire center

88
00:07:40,939 --> 00:07:45,539
abreast of latest scientific and technological developments.

89
00:07:45,539 --> 00:07:50,289
This group also supervises research to advance the state of the art.

90
00:07:50,289 --> 00:07:55,879
Among the current programs of the division is the investigating of nuclear, ionic, and

91
00:07:55,879 --> 00:08:01,319
photonic propulsion schemes that would be employed in deep spacecraft.

92
00:08:01,319 --> 00:08:07,439
The Launch Operations Directorate is responsible for NASA launching operations at Cape Canaveral,

93
00:08:07,439 --> 00:08:11,479
Florida and at the Pacific Missile Range in California.

94
00:08:11,479 --> 00:08:16,539
At Cape Canaveral, space vehicles undergo final checkouts before they are mounted on

95
00:08:16,539 --> 00:08:21,280
launching pads, fueled, and launched into outer space.

96
00:08:21,280 --> 00:08:32,050
A 310 foot tower for the mighty Saturn has been constructed.

97

00:08:32,050 --> 00:08:34,310
It is the world’s tallest structure on wheels.

98
00:08:34,310 --> 00:08:36,969
It is twenty-eight stories high.

99
00:08:36,969 --> 00:08:41,800
Each of its three platforms are as large as
a three room house.

100
00:08:41,800 --> 00:08:46,070
In the tower, the Saturn will be serviced
and fueled and made ready for launching.

101
00:08:46,070 --> 00:08:51,000
Then, the giant tower will be rolled back
on railroad tracks, safe from the effects

102
00:08:51,000 --> 00:08:52,589
of the blastoff.

103
00:08:52,589 --> 00:08:59,019
Other facilities, roads, utilities, fuel storage
areas, and a massive concrete, steel blockhouse

104
00:08:59,019 --> 00:09:06,350
are being made ready for the launching of
the Saturn.

105
00:09:06,350 --> 00:09:10,860
Most of the human and physical resources of
the George C. Marshall Space Flight Center

106
00:09:10,860 --> 00:09:13,579
are occupied with Project Saturn.

107
00:09:13,579 --> 00:09:18,940
This enormously powerful rocket will become
the workhorse of the national space program.

108
00:09:18,940 --> 00:09:24,740
Looking beyond Saturn, the Marshall Center
will develop more powerful space transportation

109
00:09:24,740 --> 00:09:25,740
systems.

110
00:09:25,740 --> 00:09:31,540
A single engine is now being developed that
will generate 1,500,000 pounds of thrust.

111
00:09:31,540 --> 00:09:36,210
When a number of these engines are clustered,
the United States will have a space potential

112
00:09:36,210 --> 00:09:37,860
of immense scope.

113
00:09:37,860 --> 00:09:40,339
Meanwhile, the focal point is Saturn.

114
00:09:40,339 --> 00:09:45,360
The eight engine cluster has been successfully
static tested in Huntsville, building up a

115
00:09:45,360 --> 00:10:09,980
tremendous rocket thrust.

116
00:10:09,980 --> 00:10:15,010
The Saturn booster will be carried from Huntsville
to Cape Canaveral, Florida in a specially

117
00:10:15,010 --> 00:10:20,160
designed barge, which has been named Palaemon
after the ancient Greek sea god, protector

118
00:10:20,160 --> 00:10:21,279
of ships.

119
00:10:21,279 --> 00:10:25,610
Palaemon is 180 feet long and thirty-eight
feet wide.

120
00:10:25,610 --> 00:10:29,569
The Saturn booster will be tied down within
the center of the barge.

121
00:10:29,569 --> 00:10:34,910
Trial runs have been made to test the reliability
and worthiness of the Palaemon for this gigantic

122
00:10:34,910 --> 00:10:45,500
undertaking and it has met the heavy demands
placed on it.

123
00:10:45,500 --> 00:10:51,680
Saturn will begin its long journey in Huntsville,
Alabama, but its final destination will be

124
00:10:51,680 --> 00:10:54,170
somewhere in outer space.

125
00:10:54,170 --> 00:11:00,529
Earth satellites measured in tons, soft landings
on the Moon, circumnavigation of the Moon

126
00:11:00,529 --> 00:11:06,420
by manned spacecraft, these are the missions
which this giant may undertake in the next

127
00:11:06,420 --> 00:11:08,360
few years.

128
00:11:08,360 --> 00:11:14,570
This is the George C. Marshall Space Flight
Center, a unique assemblage of the most experienced

129
00:11:14,570 --> 00:11:18,839

rocket designers and the finest equipment that can be provided.