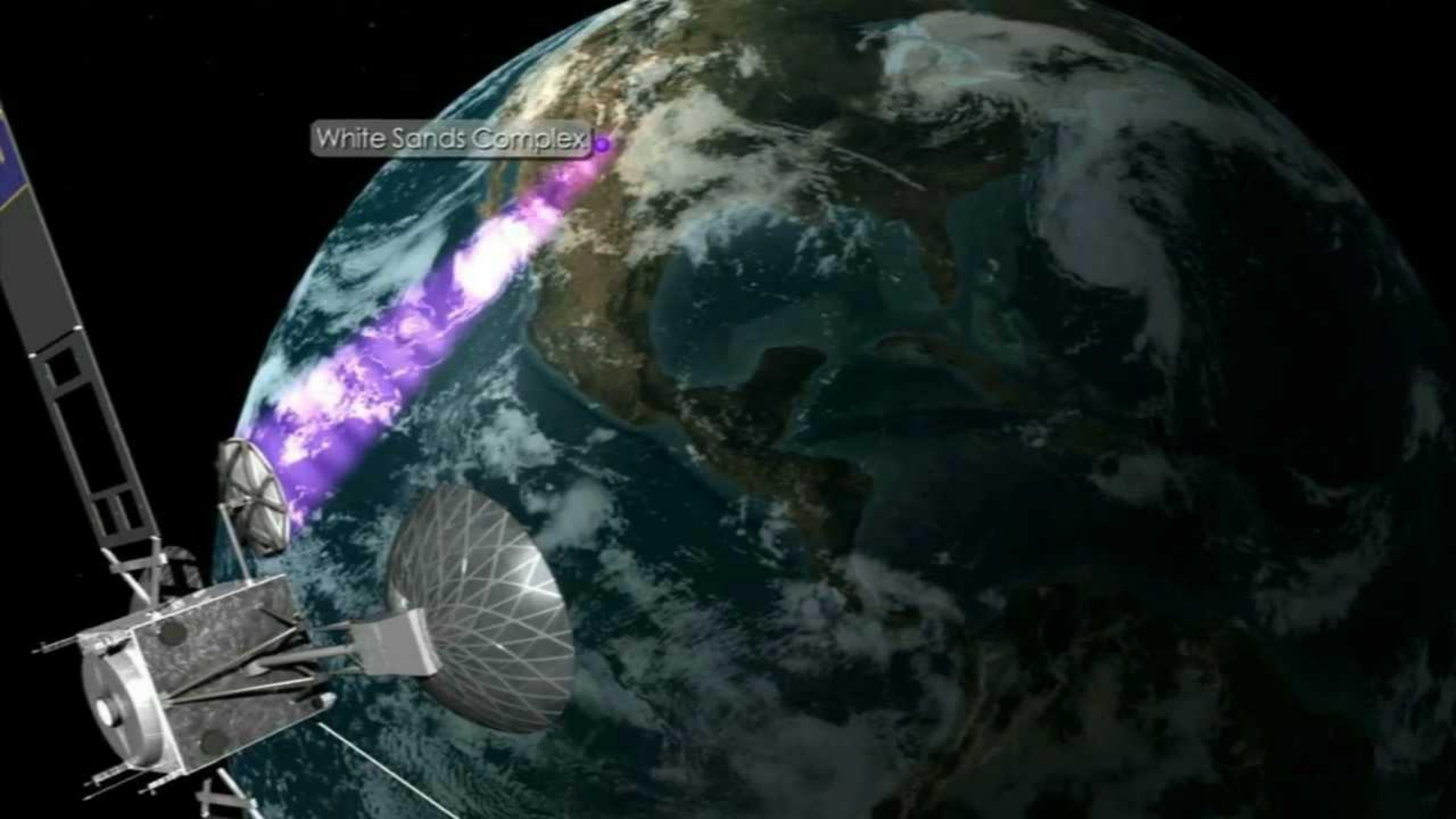
White Sands Complex

1
00:00:00,680 --> 00:00:05,710
Music

2
00:00:05,710 --> 00:00:11,290
NARRATOR: NASA will soon add a new piece to its workhorse network of communications satellites with the la

3
00:00:11,290 --> 00:00:16,570
of the TDRS-K spacecraft aboard a United Launch Alliance Atlas V rocket.

4
00:00:16,570 --> 00:00:22,680
TDRS is short for Tracking and Data Relay Satellite, and it continues to make a huge difference in the way

5
00:00:22,680 --> 00:00:28,980
astronauts and their spacecraft communicate with ground controllers. The first TDRS launched into orbit almos

6
00:00:28,980 --> 00:00:37,420
30 years ago when STS-6 astronauts deployed TDRS-1 from the space shuttle in April 1983.

7
00:00:37,420 --> 00:00:43,600
Before NASA launched its orbiting TDRS network, communications with spacecraft were sporadic, occurring on

8
00:00:43,600 --> 00:00:47,480
when the spacecraft passed near a ground station's antennas.

9
00:00:47,480 --> 00:00:53,520
With the space network in place, astronauts and ground controllers can talk to each other almost continuously.

10
00:00:53,520 --> 00:00:59,320
Just as important during this age of research in space, the TDRS satellites can convey round-the-clock

11
00:00:59,320 --> 00:01:06,160
data from automated experiments on the International Space Station to eager scientists looking for results.

12
00:01:06,160 --> 00:01:11,580
In addition, all of NASA's scientific spacecraft are built with communication gear that's compatible with the

13
00:01:11,580 --> 00:01:16,760

TDRS constellation so they can relay their observations to researchers. The Hubble Space Telescope images,

14
00:01:16,760 --> 00:01:24,750
along with all those taken by Earth-observation spacecraft in low-Earth orbit, go through a TDRS satellite

15
00:01:24,750 --> 00:01:28,510
before ground controllers and scientists receive them.

16
00:01:28,510 --> 00:01:34,940
Even a rocket ascending through the atmosphere during launch sends its telemetry through the TDRS network

17
00:01:34,940 --> 00:01:44,220
This saves NASA the sometimes costly burden of having to maintain an array of ground stations, ships and

18
00:01:44,220 --> 00:01:45,470
airplanes to communicate with a rocket in flight.

19
00:01:45,470 --> 00:01:48,840
The spacecraft launching from Cape Canaveral Air Force Station will be the eleventh launched,

20
00:01:48,840 --> 00:01:55,400
but the first in about 10 years. It is also the first of the third-generation TDRS satellites.

21
00:01:55,400 --> 00:02:02,060
A United Launch Alliance rocket was chosen for this mission several years ago. Stacked at Launch Complex 4

22
00:02:02,060 --> 00:02:07,450
at the Cape, the Altas V is expected to add to its legacy as a strong and reliable booster.

23
00:02:07,450 --> 00:02:14,650
Tim Dunn, NASA Launch Director: We chose Atlas V as the ideal launch service for the TDRS-K mission becau

24
00:02:14,650 --> 00:02:22,200
they have the 4-meter payload fairing which is the ideal size requirement for TDRS-K and also the performance

25
00:02:22,200 --> 00:02:29,930
capability of the 401 version of an Atlas V rocket with no solid rocket motors is ideally suited for the

26
00:02:29,930 --> 00:02:36,430
7,000-pound mass of TDRS satellite going to geosynchronous orbit.

27
00:02:36,430 --> 00:02:43,340
NARRATOR: The TDRS satellite's solar arrays and signature communications antennas are

28
00:02:43,340 --> 00:02:49,230
folded tightly for launch. Once safely in space, the TDRS will deploy its antennas and solar arrays

29
00:02:49,230 --> 00:02:53,180
and begin a 3-month series of tests and callibration.

30
00:02:53,180 --> 00:02:59,600
Diana Calero, NASA Mission Manager: Their antennas are furled and they have a margin, a certain amount

31
00:02:59,600 --> 00:03:04,350
of days that they can stay furled. If they pass that margin, then the antenna when they're deployed they

32
00:03:04,350 --> 00:03:11,800
can actually have a degradation in space and so it was really challenging trying to schedule the

33
00:03:11,800 --> 00:03:20,220
shipping of the spacecraft with the launch date. It was very dynamic.

34
00:03:20,220 --> 00:03:26,750
NARRATOR: Engineers also track the rocket's progress closely and had to perform more analysis after an

35
00:03:26,750 --> 00:03:32,920
engine similar to that used on the Atlas V's Centaur upper stage suffered an issue during a launch

36
00:03:32,920 --> 00:03:39,230
last year on a different rocket. The launch team does not expect a similar complication with the TDRS-K missio

37
00:03:39,230 --> 00:03:44,620
Tim Dunn: Our engineers and analysts from Launch Services Program, working alongside

38
00:03:44,620 --> 00:03:51,240

United Launch Alliance's engineers, we've been methodically reviewing data and been working very

39
00:03:51,240 --> 00:03:58,670
closely on flight clearance for the TDRS-K mission, so that's been our biggest challenge to date.

40
00:03:58,670 --> 00:04:03,770
NARRATOR: The spacecraft will operate high above the planet in an orbit whose speed matches the rotation

41
00:04:03,770 --> 00:04:08,470
of the Earth exactly, allowing the satellite to appear to hover over the planet.

42
00:04:08,470 --> 00:04:13,580
From there, it can look down on a vast portion of the planet and offer direct communication between

43
00:04:13,580 --> 00:04:19,470
the International Space Station, numerous NASA satellites orbiting Earth, and the ground stations.

44
00:04:19,470 --> 00:04:23,980
Tim Dunn: All of the communications coming out of space station goes through the TDRS network,

45
00:04:23,980 --> 00:04:29,850
is downlinked to the Earth through TDRS satellites so we're looking forward to add to that capability

46
00:04:29,850 --> 00:04:34,300
and add to the robust communications capability for NASA.

47
00:04:34,300 --> 00:04:37,490
NARRATOR: Though they provide a critical element for modern life on Earth,

48
00:04:37,490 --> 00:04:43,360
communications satellites are sometimes overlooked when it comes to the importance of spacecraft.

49
00:04:43,360 --> 00:04:47,790
Diana Calero: I think a lot of people maybe take it for granted, or they don't realize or understand

50
00:04:47,790 --> 00:04:55,740
how many communications satellites it takes or maybe the work it takes to make the progress we have

51
00:04:55,740 --> 00:05:00,010
here on Earth with all the technology we have out in space.

52
00:05:00,010 --> 00:05:05,490
NARRATOR: Beyond its utility as a communications hub, the TDRS-K satellite, like all missions,

53
00:05:05,490 --> 00:05:10,000
makes a special place in the memory of the launch team sending it into orbit.

54
00:05:10,000 --> 00:05:13,510
Diana Calero: Every mission's got its own uniqueness, I mean, they're all unique, nothing is

55
00:05:13,510 --> 00:05:20,480
ever easy. When we're going down to launch I think is the most exciting. Going into terminal count.