
NASA
DIANA CALERO
NASA Mission Manager

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00:00:16,920 --> 00:00:21,160
NARRATOR: The next component in NASA's network
of vital communications satellites will be

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00:00:21,160 --> 00:00:26,630
placed into space this month to continue the
task of relaying data and commands from Earth

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00:00:26,630 --> 00:00:29,820
to the space agency's fleet of spacecraft.

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00:00:29,820 --> 00:00:34,800
Thirty years into its operations, the Tracking
and Data Relay Satellite System has allowed

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00:00:34,800 --> 00:00:39,940
NASA to expand its abilities to communicate
directly with human spacecraft like the International

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00:00:39,940 --> 00:00:44,530
Space Station and unmanned observatories such
as the Hubble Space Telescope while being

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00:00:44,530 --> 00:00:49,790
able to forgo its network of ground-based
communications stations around the world.

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00:00:49,790 --> 00:00:55,239
TIM DUNN: The TDRS constellation brings back
all of the data and video that we see every

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00:00:55,239 --> 00:00:57,390
day from the International Space Station.

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00:00:57,390 --> 00:01:02,820
In addition, TDRS supports all of the data
from the Hubble Space Telescope and all of

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00:01:02,820 --> 00:01:06,470

our low Earth orbit NASA science missions.

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00:01:06,470 --> 00:01:12,430
NARRATOR: In other words, TDRS accomplished
exactly what NASA designed it for.

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00:01:12,430 --> 00:01:16,840
Its work is far from finished however, and
NASA's needs are not shrinking.

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00:01:16,840 --> 00:01:21,729
That's why the agency is launching TDRS-L,
the next member of the third-generation of

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00:01:21,729 --> 00:01:23,420
TDRS satellites.

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00:01:23,420 --> 00:01:29,210
TDRS-L will sustain the TDRS constellation
and it will add to this national capability.

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00:01:29,210 --> 00:01:35,600
NARRATOR: Like its predecessors, TDRS-L carries
the iconic look of two large, parabolic antennas

18
00:01:35,600 --> 00:01:38,270
and a set of solar panels.

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00:01:38,270 --> 00:01:41,539
Those antennas, each 15 feet in diameter,
provided the launch processing teams with

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00:01:41,539 --> 00:01:45,990
a bit of a challenge since there is a limited
amount of time they can stay folded and still

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00:01:45,990 --> 00:01:48,560
unfurl to their proper shape.

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00:01:48,560 --> 00:01:53,140
The processing teams kept close track of the
time they were folded and had plans ready

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00:01:53,140 --> 00:01:58,329
in case the antennas had to be opened if there
was a lengthy launch delay.

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00:01:58,329 --> 00:02:04,500
Identical to TDRS-K, which was launched in
2013, TDRS-L will take its station in geosynchronous

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00:02:04,500 --> 00:02:08,819
orbit more than 22,300 miles above Earth.

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00:02:08,819 --> 00:02:13,720
From there it can basically hover over a point
on Earth and communicate with every satellite

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00:02:13,720 --> 00:02:19,670
and spacecraft below it, along with NASA's
ground stations and other TDRS satellites.

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00:02:19,670 --> 00:02:24,569
Working in conjunction with the seven other
operational TDRS platforms already in space,

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00:02:24,569 --> 00:02:29,569
TDRS-L lets NASA stay in touch with its Earth-circling
spacecraft at all times.

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00:02:29,569 --> 00:02:35,120
In fact, TDRS spacecraft already in operation
will help track this newest member of the

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00:02:35,120 --> 00:02:39,709
family as it climbs from Cape Canaveral Air
Force Station in Florida to its new home in

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00:02:39,709 --> 00:02:42,620

space aboard an Atlas V rocket.

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00:02:42,620 --> 00:02:47,790
DUNN: If you only had antennas in Africa,
the middle of the Indian Ocean and Australia,

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00:02:47,790 --> 00:02:54,459
you are generally faced with coverage gaps,
but when you are looking down from the geostationary

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00:02:54,459 --> 00:02:59,290
orbit of the TDRS constellation, you're able
to seamlessly cover the entire period of a

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00:02:59,290 --> 00:03:00,730
launch vehicle trajectory.

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00:03:00,730 --> 00:03:06,060
NARRATOR: The United Launch Alliance Atlas
V rocket that will power the 7,600-pound TDRS-L

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00:03:06,060 --> 00:03:11,680
off the launch pad and to its orbit location
arrived at Cape Canaveral in October to begin

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00:03:11,680 --> 00:03:13,630
a couple months of processing.

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00:03:13,630 --> 00:03:18,580
DIANA CALERO: Luckily, TDRS-L has been a very
smooth flow.

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00:03:18,580 --> 00:03:23,849
TDRS-K which also was a smooth flow but it
was kind of the first time we had launched

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00:03:23,849 --> 00:03:32,530
about 10 years a TDRS satellite.

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00:03:32,530 --> 00:03:38,480
/// So we were able to apply a lot of the
lessons learned from the TDRS-K flow to the

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00:03:38,480 --> 00:03:39,480
TDRS-L.

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00:03:39,480 --> 00:03:45,190
NARRATOR: The Atlas V, which includes a venerable
Centaur upper stage, is relatively new to

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00:03:45,190 --> 00:03:50,130
NASA's launch catalog, but has taken on the
mantle of NASA's workhorse booster.

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00:03:50,130 --> 00:03:55,060
In recent years it sent probes to Jupiter,
Mars and the moon.

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00:03:55,060 --> 00:04:00,410
CALERO: Although it is very reliable and very
successful, we always, we don't change the

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00:04:00,410 --> 00:04:05,040
way we go into a launch campaign or a mission.

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00:04:05,040 --> 00:04:10,801
We have very strict requirements.///(15:21
-) So although we are very successful, we

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00:04:10,801 --> 00:04:14,569
don't diminish our involvement in any way
shape or form.

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00:04:14,569 --> 00:04:20,330
We always give it the same amount of rigor
whether it's the first second or fiftieth.

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00:04:20,330 --> 00:04:25,940
NARRATOR: While the Atlas V is a newer booster,

the Centaur is celebrating its 50th year in

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00:04:25,940 --> 00:04:27,240
service.

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00:04:27,240 --> 00:04:31,850
Developed at NASA's Glenn Research Center
in Ohio, the Centaur was the first to use

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00:04:31,850 --> 00:04:35,300
liquid hydrogen for fuel in a mix with liquid
oxygen.

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00:04:35,300 --> 00:04:41,030
Its success paved the way for later hydrogen-fueled
engines including those on the second and

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00:04:41,030 --> 00:04:46,630
third stages of the Saturn V rocket, and the
space shuttle main engines.

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00:04:46,630 --> 00:04:53,500
Launch day is Jan. 23 for the TDRS-L. For
the launch team and those who built and processed

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00:04:53,500 --> 00:04:57,630
the spacecraft, it will be a testing time,
which is normal for every launch day no matter

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00:04:57,630 --> 00:04:58,630
the mission.

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00:04:58,630 --> 00:05:04,210
CALERO: The last four minutes when you're
going into terminal count, it's just one after

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00:05:04,210 --> 00:05:05,210
another.

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00:05:05,210 --> 00:05:09,600
You don't have a whole lot of time, you don't
have time to stop and start doing things and

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00:05:09,600 --> 00:05:12,820
troubleshooting, it's very intense.

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00:05:12,820 --> 00:05:20,070
DUNN: I've been tremendously lucky to have
a highly capable team.

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00:05:20,070 --> 00:05:26,440
The United Launch Alliance and Launch Services
Program team is just exemplary, I couldn't

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00:05:26,440 --> 00:05:28,700
ask for anything better.

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00:05:28,700 --> 00:05:34,870
And in that regard, I like to make sure the
team as a whole is focused on launch day,

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00:05:34,870 --> 00:05:39,800
that we're ready for the countdown, that we've
done all the steps necessary leading up to