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1
00:00:00,329 --> 00:00:06,600
ANNCR: Engineers with NASA's Launch Services Program had to think fast in order to keep on track

2
00:00:06,600 --> 00:00:12,460
the Jan. 23 liftoff of the agency's latest
Tracking and Data Relay Satellite.

3
00:00:12,460 --> 00:00:18,160
The spacecraft, TDRS-L, was sealed atop the United Launch Alliance Atlas V

4
00:00:18,160 --> 00:00:23,689
rocket out at Cape Canaveral Air Force Station's Space Launch Complex 41.

5
00:00:23,689 --> 00:00:28,279
The launch team was just about to release
the final built-in hold of the night, with

6
00:00:28,279 --> 00:00:29,980
only four minutes left until liftoff.

7
00:00:29,980 --> 00:00:33,840
TDRS-L LAUNCH CONTROLLERS: On my mark, the
time will be T-minus four minutes and counting.

8
00:00:33,840 --> 00:00:36,150
LC, LD -- do not pick up the count.

9
00:00:36,150 --> 00:00:41,000
The delay stemmed from the rocket's telemetry
-- its ability to communicate with the ground.

10
00:00:41,000 --> 00:00:46,190
TIM CLINGER: Much in the same way a doctor
would measure the vitals of a patient, we

11
00:00:46,190 --> 00:00:49,110
measure the vitals of a rocket during the
launch countdown.

12
00:00:49,110 --> 00:00:54,260
ANNCR: There are two ways for a rocket to
send telemetry data. There's hard line -- a

13
00:00:54,260 --> 00:01:01,260
cable attached to the rocket through an umbilical
-- or radio frequency, also called RF.

14
00:01:02,050 --> 00:01:07,290
During countdown and launch, rocket and spacecraft
send this data to NASA's Telemetry Lab in

15
00:01:07,290 --> 00:01:10,940
Cape Canaveral Air Force Station's Hangar
AE.

16
00:01:10,940 --> 00:01:16,350
From there, engineers send it out to controllers'
and console displays.

17
00:01:16,350 --> 00:01:21,190
During the TDRS-L countdown, spacecraft data
was included in the stream coming from the

18
00:01:21,190 --> 00:01:22,110
Atlas V rocket.

19
00:01:22,110 --> 00:01:29,110
ALEX BIAMONTE: The spacecraft telemetry is embedded inside the launch vehicle's telemetry.

20
00:01:29,320 --> 00:01:36,320
And when it enters the building here,
we extract the spacecraft telemetry data and

21
00:01:36,990 --> 00:01:43,610
reprocess it and send it to the spacecraft
folks for their data processing system.

22
00:01:43,610 --> 00:01:48,520

ANNCR: Since a rocket can't stay "plugged in" during the climb to space, it's common

23
00:01:48,520 --> 00:01:53,590
practice to switch to RF telemetry prior to launch, just to make sure everything

24
00:01:53,590 --> 00:01:54,350
is working.

25
00:01:54,350 --> 00:02:00,409
But, just as a cell phone call is sometimes less clear than via landline, RF telemetry

26
00:02:00,409 --> 00:02:03,850
can experience occasional, brief drops in data.

27
00:02:03,850 --> 00:02:07,049
That's just what happened during the TDRS-L countdown.

28
00:02:07,049 --> 00:02:11,690
CLINGER: So as a first order response when we heard of the drop-outs was we wanted to

29
00:02:11,690 --> 00:02:16,420
correlate the spacecraft drop-outs to the drop-outs we saw on the launch vehicle, to

30
00:02:16,420 --> 00:02:21,370
prove that they were real and that we were talking about the same exact anomaly.

31
00:02:21,370 --> 00:02:24,900
The team needed a solution -- and with the launch window already open,

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00:02:24,900 --> 00:02:26,630
they needed it fast.

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00:02:26,630 --> 00:02:32,560
CLINGER: We decided that we would go back
to a hardline source that would be solid,

34
00:02:32,560 --> 00:02:38,230
have no drop-outs in it, and that we would
instantaneously switch them to the RF source

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00:02:38,230 --> 00:02:39,090
at T-0.

36
00:02:39,090 --> 00:02:43,750
ANNCR: Team members convened for a discussion
on one of the launch controllers' communication

37
00:02:43,750 --> 00:02:48,420
channels. Although this plan would impact
the data for the launch vehicle engineer,

38
00:02:48,420 --> 00:02:50,620
it also would preserve the launch opportunity.

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00:02:50,620 --> 00:02:55,620
TUAN DOAN: This is very unique because in
10 minutes, we came up with a resolution.

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00:02:55,620 --> 00:03:02,620
It's to use the hard line instead of the radio
frequency, and we switch it back at T-0. And

41
00:03:02,620 --> 00:03:09,200
the resolution are concurred by all launch
team members.

42
00:03:09,200 --> 00:03:12,000
And that turned out to be very well.

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00:03:12,849 --> 00:03:18,550

ANNCR: With a new liftoff time in sight, NASA
Launch Manager Tim Dunn and Launch Conductor

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00:03:18,550 --> 00:03:23,360
Ed Kitta of United Launch Alliance quickly
polled their controllers -- and the launch

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00:03:23,360 --> 00:03:24,950
was back on track.

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00:03:24,950 --> 00:03:31,950
GEORGE DILLER: 3, 2, 1. Main engine ignition
and liftoff of the Atlas V with TDRS-L, building