
Madrid
Ascension

1
00:00:08,030 --> 00:00:04,010
Music

2
00:00:08,050 --> 00:00:12,050
In the late 1970’s, satellites,

3
00:00:12,070 --> 00:00:16,070
such as the NIMBUS-7 satellite, relied on NASA’s ground

4
00:00:16,090 --> 00:00:20,090
stations located around the world to provide a communication network.

5
00:00:20,110 --> 00:00:24,110
This ground-based network could only provide communication over 15

6
00:00:24,130 --> 00:00:28,140
percent of the satellite’s orbit. With its ever-expanding

7
00:00:28,160 --> 00:00:32,150
orbiting fleet of satellites and manned space flights NASA had to

8
00:00:32,170 --> 00:00:36,160
increase the coverage and develop an improved way to track and communicate.

9
00:00:36,180 --> 00:00:40,190
<needle scratch> In 1983, NASA launched the first of a

10
00:00:40,210 --> 00:00:44,370
series of new communication and navigation satellites that would rely

11
00:00:44,390 --> 00:00:48,410
less on international ground stations and provide continuous coverage.

12
00:00:48,430 --> 00:00:52,440
Tracking and Data Relay Satellites (TDRS) are a network

13
00:00:52,460 --> 00:00:56,470

of geosynchronous communication satellites that work in conjunction with two

14
00:00:56,490 --> 00:01:00,490
ground stations. <music>

15
00:01:00,510 --> 00:01:04,520
Today, NASA’s fleet of spacecraft and

16
00:01:04,540 --> 00:01:08,560
launch vehicles, like the Tropical Rainfall Measuring Mission (TRMM)

17
00:01:08,580 --> 00:01:12,600
can communicate and navigate with the help of TDRS.

18
00:01:12,620 --> 00:01:16,630
This interaction between TDRS and the spacecraft is a series of complicated signals

19
00:01:16,650 --> 00:01:20,670
that guaranties that every Earth orbiting spacecraft will have nearly non-stop

20
00:01:20,690 --> 00:01:24,730
coverage. <music>

21
00:01:24,750 --> 00:01:28,790
The International Space Station (ISS) routes voice and

22
00:01:28,810 --> 00:01:32,850
video communications along with data through the TDRS fleet.

23
00:01:32,870 --> 00:01:36,890
The Hubble Space Telescope also utilizes the full

24
00:01:36,910 --> 00:01:40,910
capabilities of TDRS. TDRS supports the Hubble’s real-time interactions

25
00:01:40,930 --> 00:01:44,940
with the ground systems allowing observers to make small adjustments to its

26
00:01:44,960 --> 00:01:49,000
observatory system. TDRS provides the Earth

27
00:01:49,020 --> 00:01:53,060
Observing System of satellites, such as the Aura spacecraft,

28
00:01:53,080 --> 00:01:57,080
with low latency data relay and navigation data. The TDRS network sends

29
00:01:57,100 --> 00:02:01,120
all of these data streams and voice communications to either the White Sands

30
00:02:01,140 --> 00:02:05,150
Complex in New Mexico or the Guam Remote Ground Terminal.

31
00:02:05,170 --> 00:02:09,300
Guam then transmits the data it receives to White Sands.

32
00:02:09,320 --> 00:02:13,410
The White Sands Complex then relays it to the end user at their

33
00:02:13,430 --> 00:02:17,460
mission’s operations centers. As long as there’s space

34
00:02:17,480 --> 00:02:21,500
exploration, TDRS will be working side by side with spacecraft and end-user,

35
00:02:21,520 --> 00:02:25,560
providing continuous connectivity for navigation, data

36
00:02:25,580 --> 00:02:29,630
and voice communications. <music>

37
00:02:29,650 --> 00:02:33,700
<music> <beep>