1
00:00:02,660 --> 00:00:05,680
Sonic booms created by aircraft flying faster

2
00:00:05,700 --> 00:00:07,680
than the speed of sound certainly aren't

3
00:00:07,700 --> 00:00:10,090
known for being faint, but rather for their

4
00:00:10,110 --> 00:00:11,720
loud, make-you-jump effect.

5
00:00:11,740 --> 00:00:12,790
(sound of double sonic booms)

6
00:00:13,610 --> 00:00:16,330
But sonic booms also have a quieter side.

7
00:00:17,890 --> 00:00:20,300
NASA's Supersonics Project is embarking on

8
00:00:20,320 --> 00:00:22,730
a new effort to characterize that fainter

9
00:00:22,750 --> 00:00:25,870
side of sonic booms in the Farfield Investigation

10
00:00:25,890 --> 00:00:28,500
of No Boom Threshold project, or FaINT.

11
00:00:28,960 --> 00:00:31,010
Principal investigator Larry Cliatt at

12
00:00:31,030 --> 00:00:33,380
NASA's Dryden Flight Research Center says

13
00:00:33,400 --> 00:00:35,980

FaINT is designed to enable engineers to better

14
00:00:36,000 --> 00:00:38,510
understand evanescent waves, an acoustic

15
00:00:38,530 --> 00:00:40,820
phenomenon that occurs at the very edges

16
00:00:40,840 --> 00:00:42,720
of the normal sonic boom envelope.

17
00:00:42,740 --> 00:00:44,420
Then, you have your evanescent waves which is

18
00:00:44,440 --> 00:00:47,390
on the other side of that. They tend to be a

19
00:00:47,410 --> 00:00:50,830
lot quieter, probably about five to 10 times

20
00:00:50,850 --> 00:00:52,930
quieter than that of your normal N-wave

21
00:00:52,950 --> 00:00:54,400
sonic boom. And they kind of sound like

22
00:00:54,420 --> 00:00:55,830
a distant thunder rumble.

23
00:00:56,080 --> 00:00:58,770
Supersonic shockwaves produced by an aircraft

24
00:00:58,790 --> 00:01:01,670
flying at a speed of about Mach 1.2 or less,

25
00:01:01,690 --> 00:01:04,410
and at an altitude above 35,000 feet,

26
00:01:04,790 --> 00:01:07,180
typically do not reach the ground, so no

27
00:01:07,200 --> 00:01:09,950
sonic boom is heard. This is because the

28
00:01:09,970 --> 00:01:12,650
supersonic shockwaves created at higher altitudes

29
00:01:12,670 --> 00:01:15,480
are refracted, or bent upwards, as they enter

30
00:01:15,500 --> 00:01:17,390
the warmer air closer to the ground.

31
00:01:18,040 --> 00:01:20,520
When these shockwaves curve upward, they create

32
00:01:20,540 --> 00:01:22,920
a series of sonic boom waves that are focused

33
00:01:22,940 --> 00:01:25,460
along what is called a caustic line.

34
00:01:25,950 --> 00:01:27,930
Another phenomenon that produces evanescent waves

35
00:01:27,950 --> 00:01:30,700
is called lateral cutoff. And there you have the

36
00:01:30,720 --> 00:01:33,070
aircraft flying and the sonic boom carpet that's

37
00:01:33,090 --> 00:01:35,140
produced on the ground laterally to that.

38
00:01:35,160 --> 00:01:37,510

you also have another disturbance,

39
00:01:37,530 --> 00:01:38,910
and those are evanescent waves.

40
00:01:39,760 --> 00:01:42,340
Linear and spiral microphone arrays laid out

41
00:01:42,360 --> 00:01:44,750
on the dry lakebed at Edwards Air Force Base,

42
00:01:45,070 --> 00:01:47,680
along with microphones on a blimp-shaped balloon

43
00:01:47,700 --> 00:01:50,150
and a motor glider flying above the arrays,

44
00:01:50,170 --> 00:01:52,190
record the faint sonic booms.

45
00:01:52,670 --> 00:01:55,090
Project manager Brett Pauer says the overarching

46
00:01:55,110 --> 00:01:57,990
goal of NASA's sonic boom reduction research is

47
00:01:58,010 --> 00:02:00,000
to collect data that could help make commercial

48
00:02:00,020 --> 00:02:02,430
supersonic flight over land practical.

49
00:02:02,980 --> 00:02:05,100
The purpose of the FaINT project in general is

50
00:02:05,120 --> 00:02:07,040
just an additional piece of research that we're

51
00:02:07,060 --> 00:02:09,770
working on for having a supersonic commercial

52
00:02:09,790 --> 00:02:12,040
transport that can fly over land.

53
00:02:12,290 --> 00:02:15,440
NASA's always trying to push research,

54
00:02:15,460 --> 00:02:16,680
push boundaries, and one to the things

55
00:02:16,700 --> 00:02:18,510
we're trying to do is to bring commercial