



1  
00:00:00,736 --> 00:00:04,456  
Well, that also, the -- I guess  
you'd call it the weirdest

2  
00:00:04,796 --> 00:00:05,886  
training we ever did.

3  
00:00:06,556 --> 00:00:09,946  
And it was -- we had a thing.

4  
00:00:10,026 --> 00:00:11,866  
They had -- there  
were some problems.

5  
00:00:13,716 --> 00:00:16,836  
It was a space crafter  
dealing with a new medium now.

6  
00:00:16,836 --> 00:00:18,446  
You're not dealing  
with air flows.

7  
00:00:19,256 --> 00:00:20,736  
You're dealing with  
working in a vacuum.

8  
00:00:21,786 --> 00:00:26,306  
And to control that type craft,  
once it was up to speed going

9  
00:00:26,306 --> 00:00:28,856  
around the earth, you  
were controlled --

10  
00:00:28,856 --> 00:00:33,306  
you wanted to control  
roll and pitch and yaw,

11  
00:00:34,126 --> 00:00:39,816

and you had rate instruments  
on the instrument panel.

12

00:00:40,946 --> 00:00:43,866

And there was a big question  
about what the -- what --

13

00:00:43,866 --> 00:00:46,846

if you had a runaway  
control system, say,

14

00:00:46,846 --> 00:00:51,296

in yaw or in pitch,  
could you control it?

15

00:00:51,466 --> 00:00:53,906

If you were sitting in the  
middle of this thing --

16

00:00:54,486 --> 00:00:56,486

here you are in a cockpit  
and this thing is gone

17

00:00:56,486 --> 00:01:02,226

into uncontrolled pitch  
or uncontrollable roll

18

00:01:02,226 --> 00:01:03,476

or uncontrollable yaw.

19

00:01:04,096 --> 00:01:07,356

Would you be able to control it?

20

00:01:07,356 --> 00:01:09,456

And so it was developed  
at the -- at --

21

00:01:09,726 --> 00:01:12,646

Cleveland was what we  
called the gimbal rig.

22

00:01:13,736 --> 00:01:18,956

And it had roll, pitch, and  
yaw in three axis in the roll

23

00:01:18,956 --> 00:01:22,756

in this axis, of course,  
and pitch in this axis here,

24

00:01:23,376 --> 00:01:25,466

and yaw in this axis here.

25

00:01:26,196 --> 00:01:28,346

Now those were the three  
axes you were going to have

26

00:01:28,346 --> 00:01:29,986

to control if you're  
in the spacecraft.

27

00:01:29,986 --> 00:01:35,016

So the graduation exercise,  
more or less, as I remember now,

28

00:01:35,556 --> 00:01:38,946

that each of us went  
through, was when they did --

29

00:01:39,036 --> 00:01:42,386

you had worked up at the  
lower rates to see whether

30

00:01:42,386 --> 00:01:46,426

if you could control it or not,  
and combinations of roll, pitch,

31

00:01:46,426 --> 00:01:50,576

and yaw and then they  
did 30 rpm in roll,

32

00:01:50,696 --> 00:01:53,056

pitch and yaw at the same time.

33

00:01:53,376 --> 00:02:00,006

If you can imagine, you're doing  
30 rpm in pitch and in roll

34

00:02:00,006 --> 00:02:02,416

and in yaw all at the same time.

35

00:02:03,126 --> 00:02:05,746

And then there you sit  
watching your rate instruments

36

00:02:05,836 --> 00:02:08,376

and bringing this  
thing back to zero.

37

00:02:08,456 --> 00:02:11,096

And we could do that, which --

38

00:02:11,096 --> 00:02:14,976

and I suppose in that regard  
it was excellent training.

39

00:02:15,046 --> 00:02:18,086

-- that gimbal rig is --

40

00:02:18,206 --> 00:02:20,426

that was one of the  
more demanding test

41

00:02:20,426 --> 00:02:23,516

or training exercises  
we went through anywhere

42

00:02:23,516 --> 00:02:26,586

in the whole training  
for space flight,

43

00:02:27,376 --> 00:02:28,626

and that was at Cleveland.

44

00:02:28,626 --> 00:02:32,986

We spent -- I think when we went

up, we were up there a couple

45

00:02:32,986 --> 00:02:37,036

of times, oh, for three

or four days at a time,