1
00:00:09,669 --> 00:00:07,349
late last week there was a new satellite

2
00:00:11,430 --> 00:00:09,679
launcher that got its first tryout

3
00:00:14,150 --> 00:00:11,440
aboard the international space station

4
00:00:16,790 --> 00:00:14,160
the device is known as cyclops and it

5
00:00:19,510 --> 00:00:16,800
helped with the deployment of a

6
00:00:23,189 --> 00:00:19,520
naval research laboratory payload called

7
00:00:25,670 --> 00:00:23,199
spinsat and this morning we're going to

8
00:00:28,630 --> 00:00:25,680
learn more about cyclops

9
00:00:31,029 --> 00:00:28,640
from nasa's cyclops project manager

10
00:00:32,950 --> 00:00:31,039
daniel newswander

11
00:00:34,709 --> 00:00:32,960
he is from the structural engineering

12
00:00:36,069 --> 00:00:34,719
division here at the johnson space

13
00:00:38,069 --> 00:00:36,079

center and he's

14
00:00:40,709 --> 00:00:38,079
taken some time to come by and join us

15
00:00:42,310 --> 00:00:40,719
here to talk about that uh danny thanks

16
00:00:44,150 --> 00:00:42,320
a lot for joining us coming by you're

17
00:00:45,190 --> 00:00:44,160
welcome it's great to be here uh well

18
00:00:47,590 --> 00:00:45,200
let's see

19
00:00:48,549 --> 00:00:47,600
let's start out by just a few questions

20
00:00:51,510 --> 00:00:48,559
to say

21
00:00:53,430 --> 00:00:51,520
where did this idea come from why why is

22
00:00:54,950 --> 00:00:53,440
there a need for this type of

23
00:00:57,189 --> 00:00:54,960
deployer when we have you know other

24
00:00:58,630 --> 00:00:57,199
ones that we've used in the past well

25
00:01:00,389 --> 00:00:58,640
that's a good question

26
00:01:01,830 --> 00:01:00,399
early on it came from

27
00:01:04,149 --> 00:01:01,840
several engineers sitting in a room

28
00:01:06,390 --> 00:01:04,159
trying to come up with ideas to

29
00:01:08,149 --> 00:01:06,400
enhance or take advantage of the space

30
00:01:09,510 --> 00:01:08,159
station the capability it has it's a

31
00:01:11,350 --> 00:01:09,520
great resource and we wanted to take

32
00:01:12,870 --> 00:01:11,360
advantage of that

33
00:01:15,550 --> 00:01:12,880
we were aware the japanese were building

34
00:01:18,230 --> 00:01:15,560
a cubesat deployer the cubesat is a

35
00:01:19,830 --> 00:01:18,240
standardized cube if you will but we

36
00:01:21,670 --> 00:01:19,840
were also aware of several satellites

37
00:01:23,670 --> 00:01:21,680
out there that were if you want to call

38
00:01:25,670 --> 00:01:23,680

them geometrically challenging for

39
00:01:27,830 --> 00:01:25,680
example spin set is a big sphere it's

40
00:01:31,429 --> 00:01:27,840
about a 22 inch

41
00:01:33,350 --> 00:01:31,439
diameter 52 kilogram sphere so

42
00:01:35,590 --> 00:01:33,360
that doesn't really fit into a cubesat

43
00:01:37,749 --> 00:01:35,600
deployer so we came up with an idea to

44
00:01:39,510 --> 00:01:37,759
try to utilize take advantage of as much

45
00:01:41,270 --> 00:01:39,520
of the airlock as we could

46
00:01:43,830 --> 00:01:41,280
and take advantage of some of these

47
00:01:45,830 --> 00:01:43,840
geometrically challenging or larger

48
00:01:48,469 --> 00:01:45,840
satellites well you uh

49
00:01:50,149 --> 00:01:48,479
you touched on already with japan being

50
00:01:52,310 --> 00:01:50,159
involved obviously but

51
00:01:54,469 --> 00:01:52,320
the japanese and the canadian hardware

52
00:01:56,310 --> 00:01:54,479
that's on the station obviously

53
00:01:57,670 --> 00:01:56,320
obviously there was a big development

54
00:01:59,749 --> 00:01:57,680
team and you mentioned it who who

55
00:02:01,670 --> 00:01:59,759
actually made up that team that you're

56
00:02:03,429 --> 00:02:01,680
that you're on wow um

57
00:02:05,350 --> 00:02:03,439
yeah we had a very good group we had a

58
00:02:07,190 --> 00:02:05,360
very big group as you mentioned we

59
00:02:08,869 --> 00:02:07,200
interfaced with the japanese airlock the

60
00:02:10,710 --> 00:02:08,879
robotic airlock we interface with the

61
00:02:12,390 --> 00:02:10,720
japanese robotic arm

62
00:02:14,630 --> 00:02:12,400
the canadian arm was another interface

63
00:02:16,150 --> 00:02:14,640

of ours so there was a lot of

64
00:02:17,510 --> 00:02:16,160
interaction with their engineering

65
00:02:18,710 --> 00:02:17,520
communities their operational

66
00:02:20,470 --> 00:02:18,720
communities so there was a big

67
00:02:22,309 --> 00:02:20,480
international effort here in essence

68
00:02:23,830 --> 00:02:22,319
cyclops is an international project when

69
00:02:25,510 --> 00:02:23,840
you really look at it

70
00:02:28,070 --> 00:02:25,520
we also had

71
00:02:29,990 --> 00:02:28,080
a very extensive nasa team

72
00:02:31,830 --> 00:02:30,000
engineers we worked a lot with the

73
00:02:33,589 --> 00:02:31,840
international space station program with

74
00:02:36,710 --> 00:02:33,599
their engineers so the logistics their

75
00:02:38,710 --> 00:02:36,720
operations their payload safety tod stp

76
00:02:40,710 --> 00:02:38,720
the space test program that's here

77
00:02:42,949 --> 00:02:40,720
locally they helped us get the

78
00:02:44,470 --> 00:02:42,959
satellites uh spins as you said was an

79
00:02:46,309 --> 00:02:44,480
av satellite but they really helped us

80
00:02:48,070 --> 00:02:46,319
interface with that

81
00:02:50,229 --> 00:02:48,080
they also provided a lot of experience

82
00:02:52,390 --> 00:02:50,239
and expertise to really help us be

83
00:02:54,949 --> 00:02:52,400
successful so you're right it was a huge

84
00:02:56,390 --> 00:02:54,959
team it was very it was actually my

85
00:02:57,589 --> 00:02:56,400
favorite part of the whole process is

86
00:03:00,309 --> 00:02:57,599
interfacing with all these different

87
00:03:02,830 --> 00:03:00,319
entities and coming together as a as an

88
00:03:03,990 --> 00:03:02,840

international community and the teamwork

89
00:03:06,229 --> 00:03:04,000
yeah um

90
00:03:08,309 --> 00:03:06,239
let's take an opportunity because uh the

91
00:03:10,949 --> 00:03:08,319
japan aerospace exploration agency

92
00:03:13,509 --> 00:03:10,959
provided us some animation of the

93
00:03:15,990 --> 00:03:13,519
procedure so uh if you will walk us

94
00:03:18,630 --> 00:03:16,000
through this while we look at it here uh

95
00:03:21,030 --> 00:03:18,640
danny most definitely so actually what

96
00:03:24,470 --> 00:03:21,040
you're seeing here is uh footage of the

97
00:03:26,550 --> 00:03:24,480
astronauts uh installing cyclops and

98
00:03:29,030 --> 00:03:26,560
spin set into the airlock

99
00:03:31,030 --> 00:03:29,040
um i believe that is butch he's doing

100
00:03:33,110 --> 00:03:31,040
some final maneuvers there to make sure

101
00:03:35,350 --> 00:03:33,120
that everything is good to go once it's

102
00:03:37,270 --> 00:03:35,360
installed by the astronauts it is

103
00:03:39,509 --> 00:03:37,280
processed through the airlock and here

104
00:03:42,229 --> 00:03:39,519
you actually see some deployment

105
00:03:44,070 --> 00:03:42,239
the deployment of the satellite um as

106
00:03:45,670 --> 00:03:44,080
you can see it went off fairly smooth it

107
00:03:46,390 --> 00:03:45,680
does have a little bit of a rotation to

108
00:03:50,550 --> 00:03:46,400
it

109
00:03:52,630 --> 00:03:50,560
was actually speechless we had worked on

110
00:03:55,509 --> 00:03:52,640
this for about three years where are you

111
00:03:57,030 --> 00:03:55,519
when actually when this is going on we

112
00:03:59,110 --> 00:03:57,040
had a good team that supported down in

113
00:04:00,789 --> 00:03:59,120

the mission evaluation room okay so

114
00:04:01,990 --> 00:04:00,799
you're you're right below us we were

115
00:04:04,229 --> 00:04:02,000
there we were listening to the whole

116
00:04:06,390 --> 00:04:04,239
thing we heard the japanese applaud as

117
00:04:08,149 --> 00:04:06,400
the satellite went off um this is the

118
00:04:10,070 --> 00:04:08,159
first time they'd used their small fine

119
00:04:11,990 --> 00:04:10,080
armor their japanese robotic arm and so

120
00:04:13,509 --> 00:04:12,000
they were extremely excited about this

121
00:04:15,830 --> 00:04:13,519
well obviously what we just watched was

122
00:04:17,030 --> 00:04:15,840
the actual footage from the preparation

123
00:04:19,270 --> 00:04:17,040
that you mentioned by butch in the

124
00:04:21,349 --> 00:04:19,280
actual deployment um now let's take a

125
00:04:23,270 --> 00:04:21,359
look at the animation and you can talk a

126
00:04:24,790 --> 00:04:23,280
little bit through that procedure

127
00:04:26,150 --> 00:04:24,800
okay so here's an animation this is

128
00:04:29,590 --> 00:04:26,160
courtesy of the

129
00:04:31,030 --> 00:04:29,600
of the japanese it shows cyclops and

130
00:04:33,830 --> 00:04:31,040
spin set coming out of the airlock the

131
00:04:36,390 --> 00:04:33,840
robotic arm coming over and attaching to

132
00:04:37,830 --> 00:04:36,400
cyclops and picking cyclops up then what

133
00:04:40,310 --> 00:04:37,840
it does is it takes it out to its

134
00:04:41,909 --> 00:04:40,320
deployment position it initiates the

135
00:04:43,430 --> 00:04:41,919
deployment as you'll see here in a sec

136
00:04:44,870 --> 00:04:43,440
and then that video we just watched

137
00:04:46,469 --> 00:04:44,880
previously where you actually see the

138
00:04:48,469 --> 00:04:46,479

deployment

139
00:04:50,710 --> 00:04:48,479
this is what we envisioned it to look

140
00:04:52,870 --> 00:04:50,720
like you did have a different angle in

141
00:04:55,189 --> 00:04:52,880
the previous one notice in the animation

142
00:04:56,870 --> 00:04:55,199
there is no rotation to the satellite

143
00:04:59,670 --> 00:04:56,880
we did notice some rotation to the

144
00:05:01,670 --> 00:04:59,680
satellite were you expecting rotation or

145
00:05:03,110 --> 00:05:01,680
or does it really matter in the in this

146
00:05:04,950 --> 00:05:03,120
case um

147
00:05:06,469 --> 00:05:04,960
we weren't really expecting a lot of i

148
00:05:08,790 --> 00:05:06,479
mean you always learned something from

149
00:05:11,270 --> 00:05:08,800
anything that happens i mean but one of

150
00:05:13,110 --> 00:05:11,280
the challenges of something like this is

151
00:05:15,430 --> 00:05:13,120
you're trying to develop a system down

152
00:05:16,870 --> 00:05:15,440
here on the ground in earth that you're

153
00:05:19,110 --> 00:05:16,880
going to be using up in space and they

154
00:05:20,790 --> 00:05:19,120
don't always behave exactly like you

155
00:05:22,870 --> 00:05:20,800
think so you put a lot of effort and

156
00:05:24,550 --> 00:05:22,880
robustness into trying to figure out all

157
00:05:25,749 --> 00:05:24,560
the variables figure out all the things

158
00:05:27,350 --> 00:05:25,759
that could happen

159
00:05:29,189 --> 00:05:27,360
and so yeah we were a little surprised

160
00:05:30,550 --> 00:05:29,199
about the rotation there are a couple

161
00:05:32,230 --> 00:05:30,560
other things we're a little surprised

162
00:05:33,830 --> 00:05:32,240
about but we're going to go off and work

163
00:05:35,510 --> 00:05:33,840

though so that the next satellites that

164
00:05:37,110 --> 00:05:35,520
use it it'll be better understood and

165
00:05:39,510 --> 00:05:37,120
it'd be a better experience for well

166
00:05:42,230 --> 00:05:39,520
that leads me to my last

167
00:05:44,070 --> 00:05:42,240
major question for you and that is uh

168
00:05:46,469 --> 00:05:44,080
obviously you described already how that

169
00:05:49,909 --> 00:05:46,479
went and everybody's reaction to it but

170
00:05:53,749 --> 00:05:49,919
um so what's next for for the cyclops

171
00:05:54,870 --> 00:05:53,759
team in terms of future operations um

172
00:05:56,629 --> 00:05:54,880
cyclops is going to stay on the

173
00:05:59,029 --> 00:05:56,639
international space station it was built

174
00:06:00,870 --> 00:05:59,039
to be there for the duration and by the

175
00:06:02,550 --> 00:06:00,880
way you're seeing a photograph here and

176
00:06:03,749 --> 00:06:02,560
that's beautiful that's my favorite

177
00:06:05,830 --> 00:06:03,759
photograph of all the ones you're going

178
00:06:07,110 --> 00:06:05,840
to see and it's i kind of think of it as

179
00:06:08,550 --> 00:06:07,120
like when you see a sports team a

180
00:06:10,390 --> 00:06:08,560
football team going out to get on the

181
00:06:11,990 --> 00:06:10,400
field and play and they're all in the

182
00:06:14,150 --> 00:06:12,000
corridor there and the tunnel getting

183
00:06:15,909 --> 00:06:14,160
ready to go it's kind of like here we go

184
00:06:16,790 --> 00:06:15,919
we've been planning this for years here

185
00:06:18,870 --> 00:06:16,800
we go

186
00:06:20,550 --> 00:06:18,880
great shot of the deployment

187
00:06:21,990 --> 00:06:20,560
but pretty much what we

188
00:06:23,510 --> 00:06:22,000

built was for something to stay on the

189
00:06:24,870 --> 00:06:23,520
international space station like i

190
00:06:26,870 --> 00:06:24,880
mentioned for satellites in the

191
00:06:29,110 --> 00:06:26,880
satellite community that aren't the

192
00:06:30,150 --> 00:06:29,120
cubesat variety so they can use it so

193
00:06:32,070 --> 00:06:30,160
it's going to stay up there and be

194
00:06:34,710 --> 00:06:32,080
housed inside the space station and be

195
00:06:36,629 --> 00:06:34,720
used for future deployments

196
00:06:37,909 --> 00:06:36,639
we have three or four lined up right now

197
00:06:39,350 --> 00:06:37,919
that we're working with to try to get

198
00:06:41,990 --> 00:06:39,360
them up there and we're very very

199
00:06:44,390 --> 00:06:42,000
excited and anticipating their successes

200
00:06:46,309 --> 00:06:44,400
as well well danny i tell you we're as

201
00:06:48,070 --> 00:06:46,319
excited probably as you because we we

202
00:06:51,270 --> 00:06:48,080
just love watching stuff like that and

203
00:06:53,110 --> 00:06:51,280
seeing the success of the program and

204
00:06:54,629 --> 00:06:53,120
we really appreciate you stopping by

205
00:06:57,589 --> 00:06:54,639
this morning and talking to us a little

206
00:06:58,550 --> 00:06:57,599
bit about cyclops uh danny newswander

207
00:07:03,909 --> 00:06:58,560
the

208
00:07:05,029 --> 00:07:03,919
johnson space center and so now let's

209
00:07:07,350 --> 00:07:05,039
take a look