1
00:00:04,550 --> 00:00:01,829
station this is houston are you ready

2
00:00:04,560 --> 00:00:08,150
we are ready for the event

3
00:00:11,509 --> 00:00:09,669
marshall space flight center this is

4
00:00:18,230 --> 00:00:11,519
mission control houston please call

5
00:00:22,630 --> 00:00:20,310
station this is don reid at marshall

6
00:00:26,070 --> 00:00:22,640
space flight center for voice check how

7
00:00:33,190 --> 00:00:27,429
hey donny read you loud and clear but

8
00:00:41,190 --> 00:00:35,190
huntsville copies and with that we'll

9
00:00:44,709 --> 00:00:43,350
gentlemen this is rj helen i just wanted

10
00:00:49,510 --> 00:00:44,719
to say it's an honor

11
00:00:57,350 --> 00:00:51,670
hey rj we're really happy to be able to

12
00:01:02,310 --> 00:01:00,069
um the first question i have is what was

13
00:01:04,549 --> 00:01:02,320

your impression of my design of the

14
00:01:06,149 --> 00:01:04,559
multi-purpose precision maintenance tool

15
00:01:10,149 --> 00:01:06,159
do you think it will

16
00:01:12,870 --> 00:01:11,510
you know i think this tool will be

17
00:01:14,870 --> 00:01:12,880
useful we were just talking about it

18
00:01:16,950 --> 00:01:14,880
jeff and i were you know and what's

19
00:01:18,390 --> 00:01:16,960
what's cool about it is that oftentimes

20
00:01:20,070 --> 00:01:18,400
we're having to look for a deep well

21
00:01:21,670 --> 00:01:20,080
socket well you don't really need a deep

22
00:01:23,190 --> 00:01:21,680
well socket when you have this because

23
00:01:26,630 --> 00:01:23,200
you can hold it in your hand and put it

24
00:01:28,870 --> 00:01:26,640
down and so it has lots of useful pieces

25
00:01:31,270 --> 00:01:28,880
on here you know one thing that uh that

26
00:01:33,270 --> 00:01:31,280
oftentimes with prototyping with 3d

27
00:01:34,950 --> 00:01:33,280
printing is there's a plastic version

28
00:01:37,190 --> 00:01:34,960
then a metal version but even this

29
00:01:39,670 --> 00:01:37,200
plastic version i think would work up to

30
00:01:44,870 --> 00:01:39,680
a certain torque value so uh well done

31
00:01:49,749 --> 00:01:47,190
thank you and um

32
00:01:51,270 --> 00:01:49,759
for the next question is mostly about

33
00:01:52,389 --> 00:01:51,280
your inspiration

34
00:01:54,389 --> 00:01:52,399
for you

35
00:01:57,109 --> 00:01:54,399
for both of you actually what inspired

36
00:01:57,910 --> 00:01:57,119
you to actually pursue your career path

37
00:02:02,230 --> 00:01:57,920
and

38
00:02:06,550 --> 00:02:03,990

actually i think we we both have very

39
00:02:07,910 --> 00:02:06,560
similar career paths we both

40
00:02:10,070 --> 00:02:07,920
graduated high school and went to the

41
00:02:11,430 --> 00:02:10,080
military academy at west point

42
00:02:13,670 --> 00:02:11,440
uh we were talking about this as a

43
00:02:15,589 --> 00:02:13,680
matter of fact just a week or two ago

44
00:02:18,869 --> 00:02:15,599
about getting to the military academy

45
00:02:21,030 --> 00:02:18,879
and for me discovering that the army had

46
00:02:23,910 --> 00:02:21,040
aviation assets and you could become a

47
00:02:25,830 --> 00:02:23,920
pilot and i immediately latched on to

48
00:02:28,470 --> 00:02:25,840
that as an interest and then that

49
00:02:30,550 --> 00:02:28,480
extended to uh to later learning about

50
00:02:32,630 --> 00:02:30,560
the opportunity to become a test pilot

51
00:02:35,350 --> 00:02:32,640
and do some of the unique work uh

52
00:02:37,190 --> 00:02:35,360
inherent in that field and of course

53
00:02:38,229 --> 00:02:37,200
since the beginning of the space program

54
00:02:40,229 --> 00:02:38,239
that's been

55
00:02:42,390 --> 00:02:40,239
a a path

56
00:02:46,790 --> 00:02:42,400
to

57
00:02:49,350 --> 00:02:46,800
pursue a career as an astronaut and that

58
00:02:51,430 --> 00:02:49,360
happened to me it was in the late 70s in

59
00:02:52,869 --> 00:02:51,440
fact i i remember reading the book the

60
00:02:54,790 --> 00:02:52,879
right stuff

61
00:02:56,790 --> 00:02:54,800
which is a crown which chronicles the

62
00:02:57,990 --> 00:02:56,800
early history of

63
00:03:00,869 --> 00:02:58,000

test flight

64
00:03:02,149 --> 00:03:00,879
and in the early astronauts

65
00:03:09,350 --> 00:03:02,159
and i knew right then and there that

66
00:03:13,830 --> 00:03:11,509
that's awesome

67
00:03:16,390 --> 00:03:13,840
so the third question i have is actually

68
00:03:18,630 --> 00:03:16,400
mostly about 3d printing the 3d printing

69
00:03:20,550 --> 00:03:18,640
technology is starting to

70
00:03:22,550 --> 00:03:20,560
advance

71
00:03:25,509 --> 00:03:22,560
and so i believe it's going to have a

72
00:03:27,830 --> 00:03:25,519
huge impact in the space industry do you

73
00:03:33,110 --> 00:03:27,840
believe it's going to become a vital

74
00:03:36,869 --> 00:03:34,789
you know rj i believe that it will

75
00:03:38,550 --> 00:03:36,879
because uh one of the things that is

76
00:03:39,990 --> 00:03:38,560
very evident from our time up here on

77
00:03:42,309 --> 00:03:40,000
space station and frankly through our

78
00:03:44,390 --> 00:03:42,319
entire time with nasa and training and

79
00:03:46,710 --> 00:03:44,400
getting ready for space flight is how

80
00:03:49,110 --> 00:03:46,720
complicated it is to support a vehicle

81
00:03:52,149 --> 00:03:49,120
like this the logistical train in order

82
00:03:54,390 --> 00:03:52,159
to make this vehicle run is phenomenal

83
00:03:55,670 --> 00:03:54,400
and the planning that's required and we

84
00:03:57,190 --> 00:03:55,680
have so many smart people that are

85
00:03:59,750 --> 00:03:57,200
involved in making sure that all

86
00:04:01,589 --> 00:03:59,760
logistics are here for us and a lot of

87
00:04:03,589 --> 00:04:01,599
times it takes months and even years in

88
00:04:05,509 --> 00:04:03,599

advance of planning but if you're able

89
00:04:07,830 --> 00:04:05,519
to print the parts that you need for

90
00:04:10,309 --> 00:04:07,840
replacement and other devices i mean

91
00:04:11,190 --> 00:04:10,319
really it's a it's almost an unbounded

92
00:04:13,190 --> 00:04:11,200
uh

93
00:04:14,949 --> 00:04:13,200
sort of capability that you could have

94
00:04:17,030 --> 00:04:14,959
in order to produce the things that you

95
00:04:19,830 --> 00:04:17,040
need so i think as the technology

96
00:04:23,189 --> 00:04:19,840
develops and becomes less expensive and

97
00:04:29,189 --> 00:04:23,199
easier and more compact i think it has a

98
00:04:31,830 --> 00:04:30,950
um kind of to add on to that do you

99
00:04:34,310 --> 00:04:31,840
believe

100
00:04:36,310 --> 00:04:34,320
that there's going to be a single part

101
00:04:38,310 --> 00:04:36,320
of space exploration that this will be

102
00:04:47,670 --> 00:04:38,320
vitally important for like

103
00:04:59,030 --> 00:04:48,469
i

104
00:05:01,110 --> 00:04:59,040
one of the challenges

105
00:05:03,189 --> 00:05:01,120
related to what he was talking about is

106
00:05:05,670 --> 00:05:03,199
we have a lot of equipment a lot of

107
00:05:07,510 --> 00:05:05,680
tools a lot of spare parts on board

108
00:05:09,430 --> 00:05:07,520
trying to predict what we might need at

109
00:05:10,870 --> 00:05:09,440
any given time and then with the

110
00:05:12,790 --> 00:05:10,880
logistics train

111
00:05:14,790 --> 00:05:12,800
it can take months to get something here

112
00:05:16,230 --> 00:05:14,800
that we don't have on board

113
00:05:18,150 --> 00:05:16,240

or even longer

114
00:05:20,150 --> 00:05:18,160
depending upon what it is

115
00:05:23,189 --> 00:05:20,160
so with this capability

116
00:05:24,550 --> 00:05:23,199
it gives you the opportunity to produce

117
00:05:27,270 --> 00:05:24,560
something

118
00:05:29,909 --> 00:05:27,280
that you hadn't anticipated and and make

119
00:05:32,070 --> 00:05:29,919
it a short notice it also reduces uh

120
00:05:34,550 --> 00:05:32,080
your stowage requirements

121
00:05:36,790 --> 00:05:34,560
stowage is a really

122
00:05:39,189 --> 00:05:36,800
presents a lot of overhead to life and

123
00:05:41,510 --> 00:05:39,199
work and um and being able to operate

124
00:05:43,510 --> 00:05:41,520
the space station so being able to do

125
00:05:45,110 --> 00:05:43,520
that just in general i think

126
00:05:46,230 --> 00:05:45,120
is is uh

127
00:05:48,710 --> 00:05:46,240
um

128
00:05:50,390 --> 00:05:48,720
is very promising a tool like this now

129
00:05:51,990 --> 00:05:50,400
we don't have a specific use for this

130
00:05:54,390 --> 00:05:52,000
tool we have a

131
00:05:57,110 --> 00:05:54,400
generic use for this tool obviously

132
00:05:59,510 --> 00:05:57,120
with the hex head interfaces and whatnot

133
00:06:01,830 --> 00:05:59,520
but we don't have a specific use when

134
00:06:04,230 --> 00:06:01,840
you have a specific problem that will

135
00:06:05,909 --> 00:06:04,240
drive specific requirements and the 3d

136
00:06:08,309 --> 00:06:05,919
printing then allows you to do a quick

137
00:06:10,790 --> 00:06:08,319
design to meet those requirements get it

138
00:06:13,430 --> 00:06:10,800

printed and meet the tool or

139
00:06:20,150 --> 00:06:13,440
make the tool to meet that specific need

140
00:06:25,749 --> 00:06:23,749
for my last question i i wanted to ask

141
00:06:28,070 --> 00:06:25,759
specifically about like living in space

142
00:06:29,670 --> 00:06:28,080
what is a small aspect of living a space

143
00:06:34,710 --> 00:06:29,680
that might be a little annoying and it's

144
00:06:39,110 --> 00:06:36,710
well you know i have to say that uh we

145
00:06:40,790 --> 00:06:39,120
are so well supported up here and not

146
00:06:42,870 --> 00:06:40,800
just in um

147
00:06:45,110 --> 00:06:42,880
the the means of living in space i mean

148
00:06:47,110 --> 00:06:45,120
obviously we have the food the air the

149
00:06:49,430 --> 00:06:47,120
environment which is phenomenal right

150
00:06:52,070 --> 00:06:49,440
we're going around the planet every 90

151
00:06:54,629 --> 00:06:52,080
minutes and outside of this thin hole is

152
00:06:56,710 --> 00:06:54,639
a vacuum so that's just amazing in

153
00:06:58,390 --> 00:06:56,720
itself and so there's lots of niceties

154
00:07:00,230 --> 00:06:58,400
that are also taken care of we have

155
00:07:01,589 --> 00:07:00,240
great food on board we even have

156
00:07:04,150 --> 00:07:01,599
internet access

157
00:07:13,749 --> 00:07:04,160
but if i could have one thing one small

158
00:07:17,749 --> 00:07:16,070
that's actually all the questions i had

159
00:07:19,749 --> 00:07:17,759
thank you for your time

160
00:07:20,870 --> 00:07:19,759
this has been a great opportunity

161
00:07:24,469 --> 00:07:20,880
and i hope you enjoyed the rest of your

162
00:07:28,629 --> 00:07:25,909
well it's been really fun talking with

163
00:07:30,790 --> 00:07:28,639

you rj and congratulations i think

164
00:07:33,029 --> 00:07:30,800
yeah this is so cool and uh you've got a

165
00:07:34,790 --> 00:07:33,039
bright future in front of you because uh

166
00:07:36,790 --> 00:07:34,800
you have a creative mind a technical

167
00:07:39,430 --> 00:07:36,800
mind and really the sky's the limit

168
00:07:46,869 --> 00:07:39,440
congratulations yeah keep it up

169
00:07:51,749 --> 00:07:48,390
station this is houston acr that

170
00:07:54,950 --> 00:07:53,270
thank you marshall space flight center

171
00:07:56,390 --> 00:07:54,960
station please stand by while we