1
00:00:28,250 --> 00:00:25,880
three two one zero the Commercial Crew

2
00:00:29,720 --> 00:00:28,260
program is focused on launching humans

3
00:00:32,030 --> 00:00:29,730
safely to the International Space

4
00:00:35,180 --> 00:00:32,040
Station with our partners Boeing and

5
00:00:37,600 --> 00:00:35,190
SpaceX if you take a look above you you

6
00:00:40,220 --> 00:00:37,610
might see the station flying overhead

7
00:00:42,259 --> 00:00:40,230
today we're going to tour some of the

8
00:00:44,180 --> 00:00:42,269
facilities and tools that are being used

9
00:00:48,110 --> 00:00:44,190
to help prepare astronauts for the next

10
00:00:50,270 --> 00:00:48,120
generation of spacecraft hi i'm rachel

11
00:00:52,160 --> 00:00:50,280
power and today we're in building nine

12
00:00:55,340 --> 00:00:52,170
at the Johnson Space Center in Houston

13
00:00:58,490 --> 00:00:55,350

Texas this building is known as the

14
00:01:00,350 --> 00:00:58,500
space vehicle mock-up facility which is

15
00:01:03,380 --> 00:01:00,360
why you can see an impressive number of

16
00:01:04,729 --> 00:01:03,390
realistic space related vehicles here if

17
00:01:06,770 --> 00:01:04,739
you take a look down here on this side

18
00:01:08,810 --> 00:01:06,780
of the building this is the forward

19
00:01:11,180 --> 00:01:08,820
section of the station where you can see

20
00:01:13,910 --> 00:01:11,190
that Japanese the American and the

21
00:01:15,469 --> 00:01:13,920
European modules and over here on the

22
00:01:19,760 --> 00:01:15,479
other side of the building just out of

23
00:01:21,830 --> 00:01:19,770
you are the Russian modules let's head

24
00:01:23,540 --> 00:01:21,840
out and take a closer look at some of

25
00:01:26,930 --> 00:01:23,550
the other training tools that are used

26
00:01:28,430 --> 00:01:26,940
by our partners let's go we're making a

27
00:01:30,770 --> 00:01:28,440
quick stop here so you can see what the

28
00:01:32,690 --> 00:01:30,780
outside of the Starliner looks like this

29
00:01:34,160 --> 00:01:32,700
is a full-size mock-up of Boeing's

30
00:01:36,199 --> 00:01:34,170
brand-new space capsule

31
00:01:38,809 --> 00:01:36,209
although space capsules tend to look

32
00:01:40,969 --> 00:01:38,819
similar each one is extremely unique

33
00:01:42,529 --> 00:01:40,979
so mock-ups like this one allow

34
00:01:44,150 --> 00:01:42,539
astronauts to get acclimated to the

35
00:01:46,100 --> 00:01:44,160
physical elements of a spacecraft

36
00:01:47,359 --> 00:01:46,110
because you wouldn't want to get to

37
00:01:51,949 --> 00:01:47,369
launch day and not know how to get to

38
00:01:53,300 --> 00:01:51,959

your seat let's head inside now that

39
00:01:55,100 --> 00:01:53,310
you've seen what the outside of the

40
00:01:57,919 --> 00:01:55,110
Starliner looks like we are sitting

41
00:01:59,570 --> 00:01:57,929
inside Boeing's mission simulator part

42
00:02:02,229 --> 00:01:59,580
of the realistic atmosphere is you may

43
00:02:04,969 --> 00:02:02,239
hear reaction control jets firing as

44
00:02:08,660 --> 00:02:04,979
technology advances on earth it does in

45
00:02:10,729 --> 00:02:08,670
space as well a touchscreen has never

46
00:02:12,949 --> 00:02:10,739
been used on a spacecraft as a major

47
00:02:15,080 --> 00:02:12,959
instrument in the past and it certainly

48
00:02:16,940 --> 00:02:15,090
is a modern approach but you'll also

49
00:02:19,280 --> 00:02:16,950
notice there are still physical controls

50
00:02:20,660 --> 00:02:19,290
and these are used for critical systems

51
00:02:22,910 --> 00:02:20,670
that you wouldn't want to rely on a

52
00:02:23,590 --> 00:02:22,920
digital screen for especially in case of

53
00:02:25,720 --> 00:02:23,600
emergency

54
00:02:27,460 --> 00:02:25,730
now while the astronauts do receive

55
00:02:29,620 --> 00:02:27,470
plenty of training on the systems here

56
00:02:31,570 --> 00:02:29,630
each astronaut will also receive

57
00:02:33,160 --> 00:02:31,580
extensive training on the spacesuit that

58
00:02:35,650 --> 00:02:33,170
they'll wear while operating these

59
00:02:38,710 --> 00:02:35,660
systems Boeing's spacesuit is a

60
00:02:41,650 --> 00:02:38,720
brand-new custom design major features

61
00:02:44,620 --> 00:02:41,660
include advanced designs at the joints

62
00:02:47,230 --> 00:02:44,630
for flexibility a soft helmet with a

63
00:02:50,140 --> 00:02:47,240

zipper enclosure and lightweight and

64
00:02:52,060 --> 00:02:50,150
comfortable boots the astronauts will

65
00:02:53,620 --> 00:02:52,070
receive plenty of support while they're

66
00:02:55,240 --> 00:02:53,630
training so we're going to head down the

67
00:02:58,810 --> 00:02:55,250
hall where we can see where the trainer

68
00:03:01,210 --> 00:02:58,820
said this area is sometimes referred to

69
00:03:03,010 --> 00:03:01,220
as the bridge where a team of engineers

70
00:03:04,570 --> 00:03:03,020
and technicians will support astronauts

71
00:03:07,660 --> 00:03:04,580
while they're operating the training

72
00:03:10,390 --> 00:03:07,670
devices this team is able to monitor the

73
00:03:12,880 --> 00:03:10,400
instrumentation the systems and the

74
00:03:14,860 --> 00:03:12,890
astronaut movements the data gathered

75
00:03:17,980 --> 00:03:14,870
will help improve the hardware the

76
00:03:20,650 --> 00:03:17,990
software the interfaces the overall

77
00:03:23,710 --> 00:03:20,660
quality of the training process and the

78
00:03:25,480 --> 00:03:23,720
actual Starliner in addition to helping

79
00:03:28,060 --> 00:03:25,490
the astronauts become familiar with the

80
00:03:30,040 --> 00:03:28,070
basics and gain confidence with using

81
00:03:32,170 --> 00:03:30,050
the systems this is also a great

82
00:03:34,810 --> 00:03:32,180
opportunity to simulate when things

83
00:03:36,850 --> 00:03:34,820
don't go well so the operators are able

84
00:03:38,920 --> 00:03:36,860
to throw in failures and hazards into

85
00:03:40,450 --> 00:03:38,930
the simulation so that astronauts can be

86
00:03:43,030 --> 00:03:40,460
prepared for when things don't go

87
00:03:45,400 --> 00:03:43,040
according to plan now that we've had a

88
00:03:47,380 --> 00:03:45,410

closer look at Boeing's tools for

89
00:03:50,680 --> 00:03:47,390
training let's head over to Hawthorne

90
00:03:54,750 --> 00:03:50,690
California where SpaceX is preparing

91
00:03:57,300 --> 00:03:54,760
astronauts for their crew Dragon

92
00:04:00,149 --> 00:03:57,310
one of the best ways to help train and

93
00:04:03,000 --> 00:04:00,159
plan for operating a brand new system or

94
00:04:06,030 --> 00:04:03,010
technology is to build a replica of it

95
00:04:08,820 --> 00:04:06,040
this is a simulator of the crew dragon

96
00:04:12,089 --> 00:04:08,830
with a fully functioning avionics system

97
00:04:14,190 --> 00:04:12,099
inside here the trainers and astronauts

98
00:04:17,460 --> 00:04:14,200
will be able to walk through an entire

99
00:04:21,569 --> 00:04:17,470
cycle of suiting up climbing on board

100
00:04:24,210 --> 00:04:21,579
getting seated strapping in and walking

101
00:04:27,689 --> 00:04:24,220
through the entire check-out launch and

102
00:04:29,879 --> 00:04:27,699
orbital procedures the control interface

103
00:04:32,450 --> 00:04:29,889
is streamlined with many of the

104
00:04:34,980 --> 00:04:32,460
operations taking place on touch screens

105
00:04:36,870 --> 00:04:34,990
there are still those physical buttons

106
00:04:38,909 --> 00:04:36,880
that are essential to flight operations

107
00:04:40,800 --> 00:04:38,919
the things that you wouldn't want to

108
00:04:43,710 --> 00:04:40,810
lose the ability to do if your display

109
00:04:45,120 --> 00:04:43,720
went down the spacesuits that the

110
00:04:47,400 --> 00:04:45,130
astronauts will wear aboard the crew

111
00:04:49,860 --> 00:04:47,410
dragon they may look like something out

112
00:04:52,170 --> 00:04:49,870
of a science-fiction movie but they are

113
00:04:54,570 --> 00:04:52,180

designed to meet the rigorous standards

114
00:04:57,390 --> 00:04:54,580
set by NASA to protect the astronauts

115
00:05:00,150 --> 00:04:57,400
wearing them they combine the ability to

116
00:05:03,750 --> 00:05:00,160
pressurize with flexibility of movement

117
00:05:06,420 --> 00:05:03,760
which is key to astronaut safety the

118
00:05:08,839 --> 00:05:06,430
plan is always the spacesuit is a backup

119
00:05:11,839 --> 00:05:08,849
which contains basic life support and

120
00:05:14,779 --> 00:05:11,849
communications in case of an emergency

121
00:05:17,460 --> 00:05:14,789
now let's head over to Mission Control

122
00:05:20,029 --> 00:05:17,470
where SpaceX teams will monitor the

123
00:05:22,320 --> 00:05:20,039
Dragon spacecraft and the crew aboard

124
00:05:25,890 --> 00:05:22,330
throughout its mission to space and

125
00:05:29,580 --> 00:05:25,900
return to Earth we're standing in front

126
00:05:31,469 --> 00:05:29,590
of SpaceX's Mission Control prior to any

127
00:05:33,420 --> 00:05:31,479
launch the flight control team will

128
00:05:35,400 --> 00:05:33,430
undertake a significant amount of

129
00:05:38,790 --> 00:05:35,410
training in order to prepare for an

130
00:05:40,860 --> 00:05:38,800
actual mission just as training helps

131
00:05:42,930 --> 00:05:40,870
astronauts better understand the systems

132
00:05:45,240 --> 00:05:42,940
the flight controllers get a ton of

133
00:05:47,100 --> 00:05:45,250
great experience training and working

134
00:05:49,409 --> 00:05:47,110
with the people who will be using their

135
00:05:52,650 --> 00:05:49,419
systems while in space both the

136
00:05:55,529 --> 00:05:52,660
astronaut and flight control teams will

137
00:05:57,330 --> 00:05:55,539
have an opportunity to become familiar

138
00:05:59,210 --> 00:05:57,340

with how the other operates learning

139
00:06:01,350 --> 00:05:59,220
their tendencies and preferences

140
00:06:03,529 --> 00:06:01,360
understanding each other

141
00:06:05,939 --> 00:06:03,539
is a beneficial experience all around

142
00:06:07,830 --> 00:06:05,949
now it's said that practice makes

143
00:06:10,619 --> 00:06:07,840
perfect and that's what we count on at

144
00:06:14,040 --> 00:06:10,629
NASA whether it's training in a pool a

145
00:06:17,189 --> 00:06:14,050
classroom or a full-size space craft

146
00:06:20,459 --> 00:06:17,199
simulator we train hard so when it comes

147
00:06:22,050 --> 00:06:20,469
time for the real thing we're ready now

148
00:06:23,760 --> 00:06:22,060
that just about does it for today and

149
00:06:26,760 --> 00:06:23,770
we've only covered a fraction of it

150
00:06:29,399 --> 00:06:26,770
there's always more astronaut training

151
00:06:31,980 --> 00:06:29,409
is a process that constantly evolves and

152
00:06:34,830 --> 00:06:31,990
as we better understand new techniques

153
00:06:37,559 --> 00:06:34,840
we work to put them into practice so

154
00:06:41,159 --> 00:06:37,569
just like you we never stop working and

155
00:06:44,749 --> 00:06:41,169
never stop learning we'll see you next

156
00:06:47,640 --> 00:06:44,759
time as we prepare to launch America

157
00:06:49,980 --> 00:06:47,650
hello I'm Cathy leaders Commercial Crew

158
00:06:52,940 --> 00:06:49,990
program manager thank you for taking a