
PAO

1
00:00:05,829 --> 00:00:03,110
i'm joined right now by one of our

2
00:00:08,150 --> 00:00:05,839
mission controllers here in houston uh

3
00:00:09,669 --> 00:00:08,160
iss ground controller bill foster bill

4
00:00:11,430 --> 00:00:09,679
thank you so much for being here with me

5
00:00:13,589 --> 00:00:11,440
today well thank you for having me dan a

6
00:00:16,230 --> 00:00:13,599
real honor i've heard you called an icon

7
00:00:17,910 --> 00:00:16,240
of mission control and i know that gc

8
00:00:19,349 --> 00:00:17,920
you guys are kind of the gatekeepers to

9
00:00:20,710 --> 00:00:19,359
everything that goes on here so why

10
00:00:22,950 --> 00:00:20,720
don't you tell me you know how did you

11
00:00:24,870 --> 00:00:22,960
get that title okay well the ground

12
00:00:27,029 --> 00:00:24,880
control is just like you said it's the

13
00:00:28,550 --> 00:00:27,039

gatekeeper we're the the representative

14
00:00:29,990 --> 00:00:28,560
to the flight director for all the

15
00:00:31,910 --> 00:00:30,000
functioning of the mission control

16
00:00:33,750 --> 00:00:31,920
center and for the network

17
00:00:35,270 --> 00:00:33,760
so we work with people within the

18
00:00:36,790 --> 00:00:35,280
building our engineering support

19
00:00:38,950 --> 00:00:36,800
maintenance support

20
00:00:40,630 --> 00:00:38,960
backroom operations people

21
00:00:42,229 --> 00:00:40,640
to control the data flow through the

22
00:00:44,150 --> 00:00:42,239
building make sure the equipment's up

23
00:00:45,990 --> 00:00:44,160
running

24
00:00:48,150 --> 00:00:46,000
everything from the the front end

25
00:00:49,510 --> 00:00:48,160
processors to the bathrooms you know

26
00:00:51,830 --> 00:00:49,520
we're responsible to make sure the

27
00:00:53,590 --> 00:00:51,840
entire building is working properly

28
00:00:56,790 --> 00:00:53,600
uh we also work with people at the

29
00:00:58,389 --> 00:00:56,800
network at goddard space flight center

30
00:01:00,069 --> 00:00:58,399
white sands complex

31
00:01:01,029 --> 00:01:00,079
some of the ground stations around the

32
00:01:03,590 --> 00:01:01,039
country

33
00:01:05,109 --> 00:01:03,600
to ensure that we have data flowing

34
00:01:06,950 --> 00:01:05,119
through the space network the tdrs

35
00:01:08,310 --> 00:01:06,960
satellites so that we can communicate

36
00:01:09,670 --> 00:01:08,320
with the space station or other

37
00:01:10,870 --> 00:01:09,680
spacecraft

38
00:01:12,390 --> 00:01:10,880

and

39
00:01:14,149 --> 00:01:12,400
you know make sure everything is working

40
00:01:15,670 --> 00:01:14,159
properly okay and i mean that's that's

41
00:01:17,510 --> 00:01:15,680
something that a lot of people don't

42
00:01:19,590 --> 00:01:17,520
always recognize where it's not just you

43
00:01:21,350 --> 00:01:19,600
know the people in this room are not the

44
00:01:22,789 --> 00:01:21,360
only part of mission control there are

45
00:01:24,870 --> 00:01:22,799
people in back rooms all over this

46
00:01:27,429 --> 00:01:24,880
building and other centers you know

47
00:01:28,710 --> 00:01:27,439
other states even even other countries

48
00:01:30,789 --> 00:01:28,720
and you're kind of tying them all

49
00:01:32,469 --> 00:01:30,799
together that's correct uh last two

50
00:01:34,310 --> 00:01:32,479
nights i've been working at the ground

51
00:01:36,230 --> 00:01:34,320
control console in this room and we're

52
00:01:38,550 --> 00:01:36,240
dealing with people in in

53
00:01:40,390 --> 00:01:38,560
germany in moscow

54
00:01:42,550 --> 00:01:40,400
in japan

55
00:01:44,230 --> 00:01:42,560
the canadian space agency we're dealing

56
00:01:45,910 --> 00:01:44,240
with people all over we've got the

57
00:01:48,550 --> 00:01:45,920
marshall space flight center which is

58
00:01:49,990 --> 00:01:48,560
our primary payload operations center

59
00:01:51,990 --> 00:01:50,000
for all the science that goes on with

60
00:01:53,429 --> 00:01:52,000
the space station so

61
00:01:55,429 --> 00:01:53,439
yeah if they have a problem with

62
00:01:57,670 --> 00:01:55,439
anything dealing with getting data to

63
00:01:59,429 --> 00:01:57,680

them then it's our responsibility as the

64
00:02:01,270 --> 00:01:59,439
ground controllers to coordinate

65
00:02:03,429 --> 00:02:01,280
whatever effort is necessary to resolve

66
00:02:05,590 --> 00:02:03,439
that problem and i know you guys have a

67
00:02:07,109 --> 00:02:05,600
really integral role and actually the

68
00:02:08,869 --> 00:02:07,119
the communication between the people

69
00:02:10,630 --> 00:02:08,879
here on the ground and

70
00:02:12,710 --> 00:02:10,640
everyone up in space you guys are kind

71
00:02:13,830 --> 00:02:12,720
of you know holding all the keys to who

72
00:02:15,190 --> 00:02:13,840
gets to

73
00:02:16,309 --> 00:02:15,200
talk to the astronauts while they're up

74
00:02:18,229 --> 00:02:16,319
there you have to do all the

75
00:02:19,910 --> 00:02:18,239
communication flips and things like that

76
00:02:21,350 --> 00:02:19,920
talk a little bit about that that's

77
00:02:23,670 --> 00:02:21,360
correct we have one of our backroom

78
00:02:25,670 --> 00:02:23,680
positions known as the houston comm tech

79
00:02:27,589 --> 00:02:25,680
controls the space to ground loops that

80
00:02:29,910 --> 00:02:27,599
let us talk to the crew

81
00:02:31,750 --> 00:02:29,920
if we need to set up for a private

82
00:02:33,589 --> 00:02:31,760
medical conference or family conference

83
00:02:35,509 --> 00:02:33,599
then it's our comm tech that coordinates

84
00:02:37,990 --> 00:02:35,519
with the the

85
00:02:39,750 --> 00:02:38,000
medical people and in terms of getting

86
00:02:41,190 --> 00:02:39,760
the right phone calls patched in and

87
00:02:42,070 --> 00:02:41,200
then at the time that the conference

88
00:02:44,070 --> 00:02:42,080

starts

89
00:02:46,390 --> 00:02:44,080
moving it into a private area so that

90
00:02:48,470 --> 00:02:46,400
the only people hearing that are the two

91
00:02:50,470 --> 00:02:48,480
parties involved the medical or the

92
00:02:51,910 --> 00:02:50,480
family and the crew

93
00:02:53,509 --> 00:02:51,920
now we also

94
00:02:55,190 --> 00:02:53,519
secure the space to grounds when the

95
00:02:57,270 --> 00:02:55,200
crew goes to sleep so we don't

96
00:02:59,509 --> 00:02:57,280
inadvertently send something up to them

97
00:03:00,790 --> 00:02:59,519
and wake them up that's never a popular

98
00:03:03,110 --> 00:03:00,800
thing to do

99
00:03:05,030 --> 00:03:03,120
although i remember several years ago

100
00:03:07,030 --> 00:03:05,040
we were doing some testing in here and i

101
00:03:08,470 --> 00:03:07,040
actually did set a a test message up

102
00:03:09,990 --> 00:03:08,480
during crew sleep

103
00:03:13,830 --> 00:03:10,000
that you get some attention when you do

104
00:03:15,430 --> 00:03:13,840
that but they weren't too happy oh no

105
00:03:18,390 --> 00:03:15,440
okay well um

106
00:03:20,790 --> 00:03:18,400
that kind of covers our day-to-day now

107
00:03:23,430 --> 00:03:20,800
uh as a gc you're kind of integral in

108
00:03:25,430 --> 00:03:23,440
the role of not only maintaining but

109
00:03:28,149 --> 00:03:25,440
also you know looking ahead towards the

110
00:03:30,149 --> 00:03:28,159
future and i understand you're getting

111
00:03:32,229 --> 00:03:30,159
heavily involved with mission control's

112
00:03:35,509 --> 00:03:32,239
role in the upcoming orion test flight

113
00:03:36,789 --> 00:03:35,519

eft one that's correct um

114
00:03:38,710 --> 00:03:36,799
before

115
00:03:40,309 --> 00:03:38,720
shuttle ended i spent most of my time

116
00:03:41,990 --> 00:03:40,319
down there working launch and landing

117
00:03:43,910 --> 00:03:42,000
for the last

118
00:03:44,949 --> 00:03:43,920
13 14 years for all the space shuttle

119
00:03:47,430 --> 00:03:44,959
missions

120
00:03:48,789 --> 00:03:47,440
and now that it's retired

121
00:03:50,710 --> 00:03:48,799
the room that we

122
00:03:52,949 --> 00:03:50,720
used to support shuttle from is being

123
00:03:56,309 --> 00:03:52,959
primarily used for testing but it will

124
00:03:59,670 --> 00:03:56,319
come back into a mission support mode in

125
00:04:01,670 --> 00:03:59,680
2014 when we do the eft-1 flight

126
00:04:04,789 --> 00:04:01,680
right now we're working with lockheed

127
00:04:06,229 --> 00:04:04,799
martin out of denver who is the the

128
00:04:07,270 --> 00:04:06,239
company that's building the orion

129
00:04:09,830 --> 00:04:07,280
capsule

130
00:04:11,509 --> 00:04:09,840
and they're they're managing all of the

131
00:04:14,550 --> 00:04:11,519
the flights for nasa

132
00:04:15,350 --> 00:04:14,560
uh eft one is

133
00:04:17,110 --> 00:04:15,360
again

134
00:04:19,830 --> 00:04:17,120
we think going to go up in the april

135
00:04:21,670 --> 00:04:19,840
2014 time frame

136
00:04:24,150 --> 00:04:21,680
eventually orion will launch on the new

137
00:04:25,990 --> 00:04:24,160
space launch system the sls that nasa is

138
00:04:26,830 --> 00:04:26,000

building but for this flight

139
00:04:29,909 --> 00:04:26,840
they're

140
00:04:32,469 --> 00:04:29,919
um buying the services from

141
00:04:34,790 --> 00:04:32,479
united launch associations delta iv out

142
00:04:36,950 --> 00:04:34,800
of cape canaveral so it'll launch on a

143
00:04:37,909 --> 00:04:36,960
delta iv it'll make two orbits of the

144
00:04:40,150 --> 00:04:37,919
earth

145
00:04:41,430 --> 00:04:40,160
on the second orbit it will

146
00:04:44,950 --> 00:04:41,440
um

147
00:04:47,749 --> 00:04:44,960
for its reentry burn it will actually

148
00:04:50,870 --> 00:04:47,759
go up into a highly elliptical

149
00:04:53,030 --> 00:04:50,880
orbit going up to about 3 600 miles

150
00:04:55,189 --> 00:04:53,040
and this is the farthest we've sent

151
00:04:58,070 --> 00:04:55,199
anything intended for human you know

152
00:04:59,670 --> 00:04:58,080
occupation since the the days of apollo

153
00:05:00,950 --> 00:04:59,680
that's correct the last time we had

154
00:05:02,550 --> 00:05:00,960
people up that high and of course there

155
00:05:04,550 --> 00:05:02,560
won't be there will not be people on

156
00:05:06,710 --> 00:05:04,560
this particular mission but the last

157
00:05:09,830 --> 00:05:06,720
time we've sent a spacecraft designed

158
00:05:12,070 --> 00:05:09,840
for humans up that high was the apollo

159
00:05:13,510 --> 00:05:12,080
17 mission and the reason we're sending

160
00:05:16,070 --> 00:05:13,520
it up that high is so that when it

161
00:05:17,270 --> 00:05:16,080
re-enters it's coming in it'll be coming

162
00:05:19,830 --> 00:05:17,280
in at about

163
00:05:21,670 --> 00:05:19,840

20 000 miles an hour not quite the

164
00:05:23,110 --> 00:05:21,680
apollo speeds but close enough that we

165
00:05:24,790 --> 00:05:23,120
can get a good test

166
00:05:27,110 --> 00:05:24,800
of the heat shield and control of the

167
00:05:29,270 --> 00:05:27,120
capsule to make sure that

168
00:05:30,790 --> 00:05:29,280
the design is correct and those speeds

169
00:05:32,629 --> 00:05:30,800
are something that you experience when

170
00:05:33,830 --> 00:05:32,639
you do go out much further that's

171
00:05:37,110 --> 00:05:33,840
correct when you're just in low earth

172
00:05:38,469 --> 00:05:37,120
orbit they come in about 17 500 so

173
00:05:40,790 --> 00:05:38,479
coming back from the moon you're going

174
00:05:42,550 --> 00:05:40,800
well over 20 000 miles right now around

175
00:05:43,909 --> 00:05:42,560
25 000 miles

176
00:05:45,830 --> 00:05:43,919
when you're coming back from the moon so

177
00:05:47,590 --> 00:05:45,840
it's it's it's close it's closer than

178
00:05:48,710 --> 00:05:47,600
what you experienced you know from low

179
00:05:50,070 --> 00:05:48,720
earth orbit

180
00:05:52,550 --> 00:05:50,080
okay well why don't you tell me a little

181
00:05:54,790 --> 00:05:52,560
bit about what you guys are doing uh to

182
00:05:55,430 --> 00:05:54,800
to prepare for this test flight and kind

183
00:05:56,390 --> 00:05:55,440
of

184
00:05:58,150 --> 00:05:56,400
uh

185
00:05:59,749 --> 00:05:58,160
i mean you you mentioned that the old

186
00:06:01,350 --> 00:05:59,759
shuttle mission control room is kind of

187
00:06:03,029 --> 00:06:01,360
being converted over for testing and

188
00:06:04,629 --> 00:06:03,039

it's going to be used for this flight

189
00:06:06,309 --> 00:06:04,639
what's actually going to be happening in

190
00:06:08,150 --> 00:06:06,319
that room what kind of data are you guys

191
00:06:09,749 --> 00:06:08,160
going to be tracking from there and you

192
00:06:12,070 --> 00:06:09,759
know what's your role going to be okay

193
00:06:13,749 --> 00:06:12,080
um for for eft one

194
00:06:15,510 --> 00:06:13,759
we're there's a couple of things going

195
00:06:17,189 --> 00:06:15,520
on one we're trying to do at this the

196
00:06:18,870 --> 00:06:17,199
lowest cost possible

197
00:06:21,590 --> 00:06:18,880
because there's not a lot of budget

198
00:06:23,430 --> 00:06:21,600
right now so we're going to be using

199
00:06:25,990 --> 00:06:23,440
many of the same systems we use to

200
00:06:27,749 --> 00:06:26,000
support shuttle now we are using a

201
00:06:30,230 --> 00:06:27,759
different front-end processor a

202
00:06:32,950 --> 00:06:30,240
commercial application from harris

203
00:06:35,590 --> 00:06:32,960
corporation called comet so one of the

204
00:06:37,430 --> 00:06:35,600
things the gcs are doing is we're trying

205
00:06:39,029 --> 00:06:37,440
to understand how to operate that it's

206
00:06:40,150 --> 00:06:39,039
it's different from what we've done in

207
00:06:41,270 --> 00:06:40,160
the past

208
00:06:43,670 --> 00:06:41,280
and

209
00:06:45,430 --> 00:06:43,680
we're holding weekly data flows in the

210
00:06:47,590 --> 00:06:45,440
white figure the white flight control

211
00:06:49,670 --> 00:06:47,600
room which is the old shuttle room

212
00:06:51,670 --> 00:06:49,680
where we're basically just trying to

213
00:06:54,629 --> 00:06:51,680

learn how to operate the system how to

214
00:06:56,790 --> 00:06:54,639
flow data how to run simulations as we

215
00:06:57,990 --> 00:06:56,800
get a little bit closer to the mission

216
00:07:00,309 --> 00:06:58,000
we're going to be doing end-to-end

217
00:07:03,350 --> 00:07:00,319
testing with

218
00:07:06,870 --> 00:07:03,360
an orion test rig up in denver also with

219
00:07:08,550 --> 00:07:06,880
the orion capsule when it moves to ksc

220
00:07:10,070 --> 00:07:08,560
it'll be in the operation and checkout

221
00:07:12,230 --> 00:07:10,080
building for several months and we'll

222
00:07:14,710 --> 00:07:12,240
flow data between that in here

223
00:07:16,309 --> 00:07:14,720
so you know basically just coming up to

224
00:07:17,589 --> 00:07:16,319
speed on what we need to do and the rest

225
00:07:19,830 --> 00:07:17,599
of the flight control team that will be

226
00:07:22,230 --> 00:07:19,840
supporting are developing display so

227
00:07:24,309 --> 00:07:22,240
while we're flowing data

228
00:07:26,309 --> 00:07:24,319
into the the new system

229
00:07:28,230 --> 00:07:26,319
they can be down in the room building

230
00:07:29,990 --> 00:07:28,240
displays so that they can you know have

231
00:07:31,189 --> 00:07:30,000
the right insight into the vehicle

232
00:07:33,510 --> 00:07:31,199
during the test

233
00:07:35,270 --> 00:07:33,520
okay we just showed a few a few views

234
00:07:36,950 --> 00:07:35,280
that you were just seeing now uh we're

235
00:07:39,189 --> 00:07:36,960
in that old shuttle mission control the

236
00:07:40,629 --> 00:07:39,199
white ficker as it's known around here

237
00:07:42,710 --> 00:07:40,639
and uh are they running kind of a

238
00:07:45,749 --> 00:07:42,720

simulation today i mean up on the screen

239
00:07:47,830 --> 00:07:45,759
you can see kind of models of uh

240
00:07:49,830 --> 00:07:47,840
of that eft one launch vehicle that's

241
00:07:52,790 --> 00:07:49,840
correct uh we we do have that running

242
00:07:56,150 --> 00:07:52,800
now the the models or the the graphics

243
00:07:57,749 --> 00:07:56,160
up there are not in sync with the data

244
00:07:59,749 --> 00:07:57,759
but we like to put that up just to give

245
00:08:01,510 --> 00:07:59,759
a little bit of a flavor of what we're

246
00:08:03,110 --> 00:08:01,520
doing and the more familiar we are with

247
00:08:04,469 --> 00:08:03,120
what the mission profile is then the

248
00:08:05,189 --> 00:08:04,479
better we're going to be able to support

249
00:08:07,189 --> 00:08:05,199
it

250
00:08:10,309 --> 00:08:07,199
now the data we're flowing today is from

251
00:08:12,390 --> 00:08:10,319
a a simulator

252
00:08:15,270 --> 00:08:12,400
that's built into the workstations

253
00:08:17,110 --> 00:08:15,280
that basically just generates the

254
00:08:18,710 --> 00:08:17,120
basic onboard status during different

255
00:08:21,350 --> 00:08:18,720
mission phases

256
00:08:22,710 --> 00:08:21,360
okay uh well then aside from you know

257
00:08:25,350 --> 00:08:22,720
all these upgrades being done to the

258
00:08:27,830 --> 00:08:25,360
white figure i know that uh miss control

259
00:08:29,510 --> 00:08:27,840
is kind of in a 21st century

260
00:08:31,350 --> 00:08:29,520
revolutionary stage right now where you

261
00:08:33,350 --> 00:08:31,360
guys are looking to kind of you know

262
00:08:34,870 --> 00:08:33,360
upgrade everything

263
00:08:36,389 --> 00:08:34,880

that we're operating on i mean i know

264
00:08:39,670 --> 00:08:36,399
recently in this room we just got our

265
00:08:40,709 --> 00:08:39,680
new uh device systems so replacing some

266
00:08:43,269 --> 00:08:40,719
of the old

267
00:08:45,750 --> 00:08:43,279
uh divas which i mean how long have we

268
00:08:48,470 --> 00:08:45,760
been using the divas deepest that's the

269
00:08:51,269 --> 00:08:48,480
digital voice interface subsystem it

270
00:08:54,230 --> 00:08:51,279
came on the floor in 1993 originally it

271
00:08:56,630 --> 00:08:54,240
replaced the old viz system voice

272
00:08:59,190 --> 00:08:56,640
interface subsystem which was hard push

273
00:09:00,870 --> 00:08:59,200
buttons and a rotary dial phone

274
00:09:02,310 --> 00:09:00,880
which is it's kind of funny when

275
00:09:04,150 --> 00:09:02,320
tourists come in here because up on the

276
00:09:06,949 --> 00:09:04,160
third floor of the building we we have

277
00:09:08,150 --> 00:09:06,959
preserved the apollo control room

278
00:09:10,389 --> 00:09:08,160
then

279
00:09:12,389 --> 00:09:10,399
in that room we have the old viz key

280
00:09:14,710 --> 00:09:12,399
sets in so when when kids come through

281
00:09:16,230 --> 00:09:14,720
there they look at this round thing with

282
00:09:17,190 --> 00:09:16,240
holes in it and have no clue what it's

283
00:09:18,630 --> 00:09:17,200
for

284
00:09:20,630 --> 00:09:18,640
and then once you explain it to them

285
00:09:22,150 --> 00:09:20,640
it's funny just saying you know

286
00:09:23,990 --> 00:09:22,160
go ahead try and dial your phone number

287
00:09:26,150 --> 00:09:24,000
and after about three or four numbers

288
00:09:30,389 --> 00:09:26,160

they get fed up and quit

289
00:09:32,550 --> 00:09:30,399
but yeah so divas came in in 1993 it was

290
00:09:34,230 --> 00:09:32,560
originally designed to last about seven

291
00:09:37,030 --> 00:09:34,240
to ten years

292
00:09:39,670 --> 00:09:37,040
we've gone way beyond that time frame

293
00:09:41,670 --> 00:09:39,680
the device digital voice interface

294
00:09:43,430 --> 00:09:41,680
communication equipment i think

295
00:09:44,470 --> 00:09:43,440
is what that stands for

296
00:09:46,790 --> 00:09:44,480
um

297
00:09:49,430 --> 00:09:46,800
has been on the drawing boards for many

298
00:09:51,590 --> 00:09:49,440
years it's it's a commercial product as

299
00:09:53,590 --> 00:09:51,600
opposed to divas which was

300
00:09:55,430 --> 00:09:53,600
custom designed and built by ford

301
00:09:56,150 --> 00:09:55,440
aerospace back when they controlled the

302
00:09:58,230 --> 00:09:56,160
the

303
00:10:00,870 --> 00:09:58,240
control center

304
00:10:02,310 --> 00:10:00,880
but it's almost completely

305
00:10:04,790 --> 00:10:02,320
integrated into the building now we're

306
00:10:06,949 --> 00:10:04,800
still pulling out a few old divas key

307
00:10:09,030 --> 00:10:06,959
sets and installing some device key sets

308
00:10:10,949 --> 00:10:09,040
and some of the back rooms that aren't

309
00:10:13,269 --> 00:10:10,959
currently being used but as far as all

310
00:10:16,710 --> 00:10:13,279
the operational areas

311
00:10:18,150 --> 00:10:16,720
we've moved over to device so it's it's

312
00:10:19,430 --> 00:10:18,160
interesting getting used to it its

313
00:10:21,269 --> 00:10:19,440

characteristics are a little bit

314
00:10:22,790 --> 00:10:21,279
different than the diva so we're all

315
00:10:24,710 --> 00:10:22,800
going through growing pains with that

316
00:10:26,949 --> 00:10:24,720
but it's it offers a lot of capability

317
00:10:28,310 --> 00:10:26,959
but yeah but again we're we're upgrading

318
00:10:29,670 --> 00:10:28,320
you know we're working on the new

319
00:10:31,750 --> 00:10:29,680
technology what are some of the other

320
00:10:32,870 --> 00:10:31,760
you know 21st century innovations you

321
00:10:34,630 --> 00:10:32,880
guys are going to be looking to

322
00:10:36,310 --> 00:10:34,640
implement down the road yeah the the

323
00:10:38,550 --> 00:10:36,320
buzzword going on within mission

324
00:10:42,230 --> 00:10:38,560
operations directed is the 21 projects

325
00:10:45,910 --> 00:10:42,240
we have mcc 21 training systems 21 and

326
00:10:48,310 --> 00:10:45,920
user apps 21 all integrated together to

327
00:10:50,389 --> 00:10:48,320
give us a framework to move into the

328
00:10:53,350 --> 00:10:50,399
future programs

329
00:10:55,110 --> 00:10:53,360
at lower cost more capability a lot more

330
00:10:56,310 --> 00:10:55,120
automation

331
00:10:59,030 --> 00:10:56,320
right now

332
00:11:00,790 --> 00:10:59,040
the original iss control room down the

333
00:11:03,509 --> 00:11:00,800
hall from here has been outfitted with

334
00:11:04,790 --> 00:11:03,519
new consoles new displays

335
00:11:06,550 --> 00:11:04,800
and

336
00:11:09,190 --> 00:11:06,560
they're using that as a prototype

337
00:11:10,710 --> 00:11:09,200
environment to work up

338
00:11:12,949 --> 00:11:10,720

where we're going from here it's it's

339
00:11:14,710 --> 00:11:12,959
going to be another couple of years

340
00:11:15,670 --> 00:11:14,720
before it's fully integrated within the

341
00:11:17,350 --> 00:11:15,680
building

342
00:11:20,310 --> 00:11:17,360
but when we get there we're going to

343
00:11:22,389 --> 00:11:20,320
have various front room control

344
00:11:24,150 --> 00:11:22,399
facilities such as this room the the

345
00:11:25,750 --> 00:11:24,160
flight control room number one that iss

346
00:11:28,230 --> 00:11:25,760
runs out of

347
00:11:29,829 --> 00:11:28,240
the white ficker and the blue ficker

348
00:11:32,470 --> 00:11:29,839
blue flight control room which is the

349
00:11:34,550 --> 00:11:32,480
old iss room we're also going to build

350
00:11:35,590 --> 00:11:34,560
in what were some of our back room areas

351
00:11:37,910 --> 00:11:35,600
we're going to build what we call

352
00:11:39,750 --> 00:11:37,920
operation suites which are like smaller

353
00:11:40,870 --> 00:11:39,760
versions of a control room

354
00:11:43,269 --> 00:11:40,880
and we're going to make all this

355
00:11:45,910 --> 00:11:43,279
available not only for nasa programs

356
00:11:47,990 --> 00:11:45,920
supporting with the orion program and

357
00:11:49,430 --> 00:11:48,000
other projects that come up but also

358
00:11:51,590 --> 00:11:49,440
make it available for commercial

359
00:11:53,190 --> 00:11:51,600
customers to come in and and

360
00:11:54,790 --> 00:11:53,200
use the facilities

361
00:11:56,710 --> 00:11:54,800
so it's it's a

362
00:11:59,910 --> 00:11:56,720
it's a sort of a bold initiative that's

363
00:12:01,269 --> 00:11:59,920

going on and i think if i heard right

364
00:12:03,110 --> 00:12:01,279
y'all are going to be covering some of

365
00:12:04,790 --> 00:12:03,120
that in the in the near future showing

366
00:12:06,790 --> 00:12:04,800
some of the consoles and things i

367
00:12:08,470 --> 00:12:06,800
believe we are planning on showcasing so

368
00:12:10,310 --> 00:12:08,480
i mean it is really exciting to work

369
00:12:11,990 --> 00:12:10,320
anytime we get to you know show off

370
00:12:14,069 --> 00:12:12,000
whatever new systems are controlling our

371
00:12:15,430 --> 00:12:14,079
spacecraft yes and i mean that's what

372
00:12:18,790 --> 00:12:15,440
this room's doing

373
00:12:20,389 --> 00:12:18,800
and now bill again as as a gcu you've

374
00:12:21,829 --> 00:12:20,399
been exposed to a lot of the different

375
00:12:24,069 --> 00:12:21,839
not only the systems but also the

376
00:12:25,670 --> 00:12:24,079
culture here inside of mission control

377
00:12:27,910 --> 00:12:25,680
the culture in the in the mcc is

378
00:12:30,870 --> 00:12:27,920
something that's that's very unique the

379
00:12:32,629 --> 00:12:30,880
way we do business the way we train

380
00:12:34,069 --> 00:12:32,639
the the hours that we put in is

381
00:12:36,230 --> 00:12:34,079
something that you don't see in a lot of

382
00:12:38,230 --> 00:12:36,240
places

383
00:12:39,990 --> 00:12:38,240
if you look around the room you'll see a

384
00:12:41,430 --> 00:12:40,000
lot of plaques on the wall

385
00:12:43,350 --> 00:12:41,440
the whole tradition of hanging the

386
00:12:44,790 --> 00:12:43,360
plaques and then

387
00:12:47,030 --> 00:12:44,800
what that means

388
00:12:48,870 --> 00:12:47,040

is part of the culture you walk into the

389
00:12:49,750 --> 00:12:48,880
apollo control room

390
00:12:51,430 --> 00:12:49,760
and

391
00:12:53,350 --> 00:12:51,440
you know you can just fill the history

392
00:12:55,750 --> 00:12:53,360
that's there you can almost still see

393
00:12:57,269 --> 00:12:55,760
the smoke hanging from the ceiling

394
00:13:00,069 --> 00:12:57,279
back when they used to smoke here and

395
00:13:03,509 --> 00:13:00,079
then they used a we used a system called

396
00:13:07,430 --> 00:13:03,519
pneumatic tubes to move paperwork around

397
00:13:09,430 --> 00:13:07,440
and that was part of the the 1960s email

398
00:13:11,110 --> 00:13:09,440
right the bet if you wanted to print out

399
00:13:12,710 --> 00:13:11,120
you pushed a button on your console it

400
00:13:14,470 --> 00:13:12,720
went to a printer in another part of the

401
00:13:16,870 --> 00:13:14,480
building and about two minutes later it

402
00:13:18,069 --> 00:13:16,880
popped up at your console in a in a

403
00:13:20,550 --> 00:13:18,079
p-tube

404
00:13:23,590 --> 00:13:20,560
so kind of an interesting thing though

405
00:13:25,590 --> 00:13:23,600
one of the big cultural aspects

406
00:13:27,990 --> 00:13:25,600
of this is is our flight directors from

407
00:13:30,550 --> 00:13:28,000
the very beginning with chris kraft they

408
00:13:33,590 --> 00:13:30,560
picked names for their teams and chris

409
00:13:36,470 --> 00:13:33,600
craft was known as red flight he had the

410
00:13:40,310 --> 00:13:38,870
gene kranz became white flight you know

411
00:13:41,990 --> 00:13:40,320
from apollo 13

412
00:13:43,990 --> 00:13:42,000
fame if you saw the movie and he saw him

413
00:13:46,310 --> 00:13:44,000

in his white vest you know he he always

414
00:13:47,990 --> 00:13:46,320
wore the colors of his team

415
00:13:49,990 --> 00:13:48,000
john hodge was blue flight those were

416
00:13:52,870 --> 00:13:50,000
the first three flight directors

417
00:13:54,230 --> 00:13:52,880
and as others came online glen lunny was

418
00:13:55,269 --> 00:13:54,240
black flight and

419
00:13:57,829 --> 00:13:55,279
dumb

420
00:14:00,069 --> 00:13:57,839
they eventually ran out of useful colors

421
00:14:03,030 --> 00:14:00,079
to do so they they started picking

422
00:14:05,670 --> 00:14:03,040
either constellations or just something

423
00:14:07,750 --> 00:14:05,680
that was symbolic to what they are

424
00:14:09,829 --> 00:14:07,760
and a few years ago

425
00:14:11,750 --> 00:14:09,839
working with them i started designing

426
00:14:12,790 --> 00:14:11,760
some emblems to go along with their team

427
00:14:13,670 --> 00:14:12,800
names

428
00:14:15,829 --> 00:14:13,680
and

429
00:14:18,470 --> 00:14:15,839
have gotten to the point where i've got

430
00:14:20,310 --> 00:14:18,480
pretty much a emblem design for

431
00:14:22,629 --> 00:14:20,320
all the active flight directors and even

432
00:14:23,990 --> 00:14:22,639
a few of the past ones

433
00:14:26,230 --> 00:14:24,000
and i think you may have some that you

434
00:14:28,470 --> 00:14:26,240
can show for i think we do we have uh

435
00:14:30,870 --> 00:14:28,480
atlas flight here yeah atlas flight is

436
00:14:32,470 --> 00:14:30,880
paul hill he's the head of the mission

437
00:14:34,150 --> 00:14:32,480
operations

438
00:14:36,230 --> 00:14:34,160

directorate right now

439
00:14:39,269 --> 00:14:36,240
and he wanted his emblem to look a lot

440
00:14:41,829 --> 00:14:39,279
like the mod emblem

441
00:14:46,550 --> 00:14:43,750
so that was that was a fun one to build

442
00:14:47,910 --> 00:14:46,560
had had a lot of help from mike kuda

443
00:14:50,150 --> 00:14:47,920
a friend of mine that used to work at

444
00:14:53,430 --> 00:14:50,160
star trek and getting that one designed

445
00:14:55,110 --> 00:14:53,440
carbon flight and then zeiss

446
00:14:57,750 --> 00:14:55,120
that was a fun one to work on coming up

447
00:14:59,509 --> 00:14:57,760
with the sort of the carbon ball type

448
00:15:01,189 --> 00:14:59,519
background

449
00:15:03,590 --> 00:15:01,199
and then he the

450
00:15:05,430 --> 00:15:03,600
wording around the the side toughness

451
00:15:07,269 --> 00:15:05,440
competence vigilance discipline are all

452
00:15:10,710 --> 00:15:07,279
part of the the culture of the flight

453
00:15:14,550 --> 00:15:12,790
eagle flight john mccullough up until

454
00:15:16,470 --> 00:15:14,560
the last week or so was the head of the

455
00:15:19,189 --> 00:15:16,480
flight director office as he's moved on

456
00:15:20,150 --> 00:15:19,199
to other assignments here at jsc

457
00:15:25,350 --> 00:15:20,160
uh

458
00:15:28,470 --> 00:15:25,360
did this this were a fun two to work on

459
00:15:30,629 --> 00:15:28,480
this one and the next one onyx flight

460
00:15:32,389 --> 00:15:30,639
onyx flight is brian lunny which was

461
00:15:34,550 --> 00:15:32,399
glenn's son the first

462
00:15:36,230 --> 00:15:34,560
and only right now father-son flight

463
00:15:39,269 --> 00:15:36,240

director that's been out there but glenn

464
00:15:40,550 --> 00:15:39,279
supported the apollo missions and

465
00:15:42,949 --> 00:15:40,560
um

466
00:15:44,949 --> 00:15:42,959
brian until the time that he left nasa

467
00:15:47,509 --> 00:15:44,959
was supporting the shuttle ascent so i

468
00:15:48,949 --> 00:15:47,519
got to work with him quite a bit

469
00:15:50,389 --> 00:15:48,959
okay well

470
00:15:51,509 --> 00:15:50,399
uh

471
00:15:53,430 --> 00:15:51,519
like you said you've had kind of a

472
00:15:54,389 --> 00:15:53,440
direct role in designing a lot of those

473
00:15:57,030 --> 00:15:54,399
patches

474
00:15:59,189 --> 00:15:57,040
yeah it's been fun doing that

475
00:16:01,590 --> 00:15:59,199
i got involved with designing a little

476
00:16:02,790 --> 00:16:01,600
bit after the columbia accident

477
00:16:04,389 --> 00:16:02,800
when

478
00:16:06,310 --> 00:16:04,399
sitting on console during the

479
00:16:08,790 --> 00:16:06,320
investigation you had a lot of time on

480
00:16:10,870 --> 00:16:08,800
your hands as a gc because we weren't

481
00:16:12,710 --> 00:16:10,880
necessarily actively

482
00:16:14,949 --> 00:16:12,720
doing stuff we were more the gatekeepers

483
00:16:16,949 --> 00:16:14,959
of the data that got handed out

484
00:16:19,110 --> 00:16:16,959
and i came up with the idea of designing

485
00:16:21,509 --> 00:16:19,120
a an emblem to represent all of the

486
00:16:23,590 --> 00:16:21,519
crews that we've lost in space

487
00:16:25,990 --> 00:16:23,600
and that's where my kakuta really came

488
00:16:28,069 --> 00:16:26,000

in very handy he uh

489
00:16:29,670 --> 00:16:28,079
helped with that quite a bit and then i

490
00:16:30,470 --> 00:16:29,680
would give him some concepts and he

491
00:16:33,189 --> 00:16:30,480
would

492
00:16:35,110 --> 00:16:33,199
send back uh pretty quickly a lot of

493
00:16:37,910 --> 00:16:35,120
neat designs on that and eventually that

494
00:16:42,629 --> 00:16:39,910
space flight memorial emblem

495
00:16:43,910 --> 00:16:42,639
which is hanging in the room right now

496
00:16:46,389 --> 00:16:43,920
okay well

497
00:16:48,389 --> 00:16:46,399
again bill foster gc gatekeeper mission

498
00:16:49,990 --> 00:16:48,399
control and icon as well i want to

499
00:16:51,509 --> 00:16:50,000
really thank you for giving us an inside

500
00:16:53,749 --> 00:16:51,519
look to everything it is that you guys

501
00:16:55,269 --> 00:16:53,759
do the workings of this room and what we

502
00:16:56,629 --> 00:16:55,279
have to look forward to thanks for being