
PAO

1
00:00:05,430 --> 00:00:03,189
one of the big activities for the last

2
00:00:08,390 --> 00:00:05,440
two weeks has been the upgrades to the

3
00:00:09,750 --> 00:00:08,400
iss k.u and communications systems and

4
00:00:11,190 --> 00:00:09,760
there's been a team behind the scenes

5
00:00:12,310 --> 00:00:11,200
who's been working this for years we

6
00:00:13,990 --> 00:00:12,320
have one of the

7
00:00:15,509 --> 00:00:14,000
leads of that team joining us here this

8
00:00:17,029 --> 00:00:15,519
is penny roberts from the international

9
00:00:18,550 --> 00:00:17,039
space station software and avionics

10
00:00:20,870 --> 00:00:18,560
group thanks so much for joining us

11
00:00:22,710 --> 00:00:20,880
you're welcome so this has been a big

12
00:00:24,390 --> 00:00:22,720
endeavor it's been the focus of the

13
00:00:25,670 --> 00:00:24,400

activities largely for the ground

14
00:00:28,230 --> 00:00:25,680
control team and as well for the

15
00:00:29,990 --> 00:00:28,240
on-orbit crew but it started upwards of

16
00:00:31,830 --> 00:00:30,000
seven years ago can you kind of tell us

17
00:00:33,510 --> 00:00:31,840
what was the genesis for all of this and

18
00:00:34,630 --> 00:00:33,520
how did it begin

19
00:00:36,630 --> 00:00:34,640
well we had to

20
00:00:39,030 --> 00:00:36,640
consider when the space shuttle retired

21
00:00:41,750 --> 00:00:39,040
how we would spare the vehicle

22
00:00:44,229 --> 00:00:41,760
and so we went to build a bunch of spare

23
00:00:45,990 --> 00:00:44,239
boxes to make sure we had adequate

24
00:00:47,990 --> 00:00:46,000
resources to keep the space station

25
00:00:50,069 --> 00:00:48,000
going for the life of the program

26
00:00:51,270 --> 00:00:50,079
and we reconsidered doing that for this

27
00:00:53,510 --> 00:00:51,280
particular

28
00:00:55,750 --> 00:00:53,520
system instead we looked at upgrading it

29
00:00:57,830 --> 00:00:55,760
to provide enhanced capabilities to

30
00:00:59,830 --> 00:00:57,840
ensure we had the full utility of all

31
00:01:01,750 --> 00:00:59,840
the payloads and experiments and

32
00:01:03,990 --> 00:01:01,760
international partners onboard the space

33
00:01:06,310 --> 00:01:04,000
station to to make sure we could get the

34
00:01:08,469 --> 00:01:06,320
data to the ground and so we looked at

35
00:01:10,950 --> 00:01:08,479
upgrading this system instead of just

36
00:01:13,429 --> 00:01:10,960
building the same box to print

37
00:01:15,030 --> 00:01:13,439
and so for for an endeavor like that how

38
00:01:16,390 --> 00:01:15,040

did you guys even start facing the

39
00:01:18,149 --> 00:01:16,400
challenge bringing the teams together

40
00:01:19,270 --> 00:01:18,159
and figuring out what was needed

41
00:01:21,429 --> 00:01:19,280
well the first thing you got to do is

42
00:01:23,990 --> 00:01:21,439
contact the users find out what they

43
00:01:25,670 --> 00:01:24,000
need look at the program in the future

44
00:01:27,190 --> 00:01:25,680
and what's coming and what data needs to

45
00:01:29,429 --> 00:01:27,200
get to the ground and

46
00:01:30,630 --> 00:01:29,439
where the data is going to be located at

47
00:01:32,310 --> 00:01:30,640
and then you have to figure out how do

48
00:01:34,550 --> 00:01:32,320
you deploy it in such a way that you

49
00:01:36,230 --> 00:01:34,560
meet the needs as the program evolves

50
00:01:37,590 --> 00:01:36,240
and that you don't take down the system

51
00:01:39,190 --> 00:01:37,600
for too long while you're trying to

52
00:01:41,190 --> 00:01:39,200
upgrade it because it's it's a challenge

53
00:01:42,630 --> 00:01:41,200
to upgrade a moving platform

54
00:01:45,190 --> 00:01:42,640
and so we pulled together the right

55
00:01:48,230 --> 00:01:45,200
people we we talked through the issues

56
00:01:49,190 --> 00:01:48,240
and the needs and we we came up with a

57
00:01:51,190 --> 00:01:49,200
phased

58
00:01:52,230 --> 00:01:51,200
design and development approach that

59
00:01:54,550 --> 00:01:52,240
would get us

60
00:01:55,910 --> 00:01:54,560
to the end of the program and it sounds

61
00:01:58,709 --> 00:01:55,920
like you were saying that this started

62
00:02:00,389 --> 00:01:58,719
just as you know a plan to enhance it

63
00:02:02,230 --> 00:02:00,399

but really the timing worked out perfect

64
00:02:04,389 --> 00:02:02,240
because it seems like it's really been

65
00:02:05,830 --> 00:02:04,399
needed to have that additional bandwidth

66
00:02:06,870 --> 00:02:05,840
at least for the science and experiment

67
00:02:08,710 --> 00:02:06,880
data

68
00:02:11,110 --> 00:02:08,720
yeah we're positive that the bandwidth

69
00:02:13,110 --> 00:02:11,120
will be filled and is already filled by

70
00:02:14,710 --> 00:02:13,120
the the payloads that are needing to get

71
00:02:15,589 --> 00:02:14,720
data to the ground

72
00:02:17,990 --> 00:02:15,599
so

73
00:02:19,430 --> 00:02:18,000
these uh initial conversations concept

74
00:02:21,350 --> 00:02:19,440
started about seven years ago but you

75
00:02:23,270 --> 00:02:21,360
said it started in earnest about four

76
00:02:25,910 --> 00:02:23,280
years ago walk us through

77
00:02:27,190 --> 00:02:25,920
what what happens over four years to for

78
00:02:29,430 --> 00:02:27,200
something like this

79
00:02:31,589 --> 00:02:29,440
well we started by first

80
00:02:32,630 --> 00:02:31,599
looking at the robustness of the system

81
00:02:39,190 --> 00:02:32,640
and

82
00:02:41,430 --> 00:02:39,200
to improve the robustness we we first

83
00:02:42,550 --> 00:02:41,440
actually deployed an antenna a new

84
00:02:43,270 --> 00:02:42,560
antenna

85
00:02:47,190 --> 00:02:43,280
to

86
00:02:49,350 --> 00:02:47,200
a robustness outside where we had single

87
00:02:51,430 --> 00:02:49,360
point failures we actually put a new

88
00:02:53,190 --> 00:02:51,440

boom outside we put a new antenna on it

89
00:02:54,869 --> 00:02:53,200
and a new um

90
00:02:56,869 --> 00:02:54,879
transmitter receiver controller and so

91
00:02:59,830 --> 00:02:56,879
that happened several years ago and then

92
00:03:01,589 --> 00:02:59,840
we looked at the the payload data path

93
00:03:03,910 --> 00:03:01,599
and we upgraded one of our boxes that

94
00:03:05,990 --> 00:03:03,920
are on orbit tube to aggregate data into

95
00:03:07,750 --> 00:03:06,000
a single channel and get us multiple

96
00:03:09,270 --> 00:03:07,760
channels to the ground and then now

97
00:03:11,670 --> 00:03:09,280
we're doing the big one which is the

98
00:03:14,309 --> 00:03:11,680
integrated communications unit and this

99
00:03:17,110 --> 00:03:14,319
one actually expands the the bandwidth

100
00:03:19,350 --> 00:03:17,120
of data getting to the ground as well as

101
00:03:21,190 --> 00:03:19,360
data coming up to the space station

102
00:03:23,750 --> 00:03:21,200
and the ability to

103
00:03:25,430 --> 00:03:23,760
send video down using modern techniques

104
00:03:26,789 --> 00:03:25,440
and so there was several enhancements

105
00:03:28,149 --> 00:03:26,799
that were part of this and we just pull

106
00:03:30,390 --> 00:03:28,159
a community of people together from

107
00:03:31,990 --> 00:03:30,400
across the country to make that happen

108
00:03:34,390 --> 00:03:32,000
as well as work with the space network

109
00:03:36,149 --> 00:03:34,400
folks to get the tdrs and utilize

110
00:03:38,630 --> 00:03:36,159
capabilities that we've never used in

111
00:03:40,869 --> 00:03:38,640
our communication satellite

112
00:03:42,949 --> 00:03:40,879
um so yeah speaking of the team how many

113
00:03:45,110 --> 00:03:42,959

people are we talking about

114
00:03:47,509 --> 00:03:45,120
well we're trying to procure about 500

115
00:03:49,190 --> 00:03:47,519
patches right now for the team and i'm

116
00:03:51,030 --> 00:03:49,200
not sure that's going to be enough

117
00:03:52,550 --> 00:03:51,040
because we had members in california

118
00:03:54,710 --> 00:03:52,560
members in denver

119
00:03:56,229 --> 00:03:54,720
members in white sands marshall space

120
00:03:58,630 --> 00:03:56,239
flight center has been a major player in

121
00:04:01,190 --> 00:03:58,640
this activity as well as the folks here

122
00:04:03,750 --> 00:04:01,200
even maryland florida so we've got a lot

123
00:04:06,070 --> 00:04:03,760
of a lot of people contributed to this

124
00:04:07,670 --> 00:04:06,080
project to make it a success so you all

125
00:04:09,670 --> 00:04:07,680
must be really really happy everything

126
00:04:11,350 --> 00:04:09,680
seems to have been going really smoothly

127
00:04:14,550 --> 00:04:11,360
last week and this week the installation

128
00:04:16,789 --> 00:04:14,560
of the the new calm one unit

129
00:04:19,189 --> 00:04:16,799
yeah everybody's been very happy

130
00:04:21,030 --> 00:04:19,199
we you know you're cautiously optimistic

131
00:04:22,950 --> 00:04:21,040
and hope nothing will go wrong and you

132
00:04:25,030 --> 00:04:22,960
encounter problems but you find a team

133
00:04:28,629 --> 00:04:25,040
who can can solve those problems so

134
00:04:30,310 --> 00:04:28,639
quickly and and we we've been very much

135
00:04:31,670 --> 00:04:30,320
happy we've been pulling in the entire

136
00:04:34,310 --> 00:04:31,680
team because some of the team has left

137
00:04:35,590 --> 00:04:34,320
many years ago and so we've been letting

138
00:04:37,270 --> 00:04:35,600

them know what's going on and they've

139
00:04:38,710 --> 00:04:37,280
been sharing in the deployment and

140
00:04:40,469 --> 00:04:38,720
enjoying

141
00:04:41,270 --> 00:04:40,479
the success that we've had the past two

142
00:04:42,790 --> 00:04:41,280
weeks

143
00:04:43,909 --> 00:04:42,800
so i think there's still some more steps

144
00:04:45,909 --> 00:04:43,919
next week can you kind of walk us

145
00:04:47,830 --> 00:04:45,919
through where we are at now and what is

146
00:04:49,590 --> 00:04:47,840
yet remaining for this

147
00:04:51,590 --> 00:04:49,600
well we've done most of the work the

148
00:04:53,670 --> 00:04:51,600
crew has plugged in both of the boxes

149
00:04:55,510 --> 00:04:53,680
that were added to the avionics rack iii

150
00:04:57,990 --> 00:04:55,520
all the cabling has been laid out for

151
00:04:59,909 --> 00:04:58,000
the past year over the past year we've

152
00:05:01,909 --> 00:04:59,919
been putting the cables on board and so

153
00:05:04,310 --> 00:05:01,919
what's left to go is to activate the

154
00:05:06,230 --> 00:05:04,320
final box and and that just means to

155
00:05:08,070 --> 00:05:06,240
check out the performance of that box

156
00:05:09,990 --> 00:05:08,080
make sure it's all of its functions are

157
00:05:12,550 --> 00:05:10,000
performing as we expected and then we

158
00:05:14,710 --> 00:05:12,560
plan to stay on using that box versus

159
00:05:17,270 --> 00:05:14,720
the the one we were using right this

160
00:05:19,909 --> 00:05:17,280
moment and so that's next week on

161
00:05:21,510 --> 00:05:19,919
thursday and then it's just you know

162
00:05:24,550 --> 00:05:21,520
enjoying the capability that we've

163
00:05:25,909 --> 00:05:24,560

provided to not only the u.s lab but the

164
00:05:27,270 --> 00:05:25,919
entire

165
00:05:29,590 --> 00:05:27,280
partnership that we have on the space

166
00:05:31,749 --> 00:05:29,600
station so it enhances everybody's

167
00:05:33,990 --> 00:05:31,759
capabilities to get data to the ground

168
00:05:36,310 --> 00:05:34,000
absolutely um so

169
00:05:37,830 --> 00:05:36,320
once it is complete then i'm imagining

170
00:05:39,830 --> 00:05:37,840
there's some sort of you know some

171
00:05:41,749 --> 00:05:39,840
remaining tasks and phase down but

172
00:05:42,629 --> 00:05:41,759
after that what what's up for you after

173
00:05:44,469 --> 00:05:42,639
this

174
00:05:45,189 --> 00:05:44,479
well we made the box so we can upgrade

175
00:05:46,870 --> 00:05:45,199
it

176
00:05:48,390 --> 00:05:46,880
and we can upgrade a lot easier than

177
00:05:51,110 --> 00:05:48,400
what we've done this time we've we've

178
00:05:53,909 --> 00:05:51,120
used state-of-the-art technology taking

179
00:05:56,230 --> 00:05:53,919
ourselves from a tape deck recorder to

180
00:05:57,749 --> 00:05:56,240
solid state recording capability and one

181
00:06:00,070 --> 00:05:57,759
of the bigger things we did was we're

182
00:06:01,909 --> 00:06:00,080
using what's called filled programmable

183
00:06:03,909 --> 00:06:01,919
gate arrays and that allows us the

184
00:06:05,830 --> 00:06:03,919
capability to take encoding techniques

185
00:06:08,629 --> 00:06:05,840
that we're using today and change them

186
00:06:10,710 --> 00:06:08,639
tomorrow so when the technology advances

187
00:06:12,230 --> 00:06:10,720
we can advance with it and so one of the

188
00:06:14,230 --> 00:06:12,240

first things we'd like to do quite

189
00:06:16,150 --> 00:06:14,240
frankly is upgrade it again through

190
00:06:18,150 --> 00:06:16,160
reprogramming it to get twice as much

191
00:06:19,830 --> 00:06:18,160
data to the ground and we're looking at

192
00:06:20,790 --> 00:06:19,840
whether we can increase the bandwidth up

193
00:06:23,110 --> 00:06:20,800
as well

194
00:06:25,350 --> 00:06:23,120
and then it's a card replaceable box so

195
00:06:27,270 --> 00:06:25,360
we may be able to pull out a memory card

196
00:06:30,390 --> 00:06:27,280
and put in a new memory card and have

197
00:06:31,909 --> 00:06:30,400
increased capacity and so it's it's a

198
00:06:34,309 --> 00:06:31,919
platform that allows us to grow for the

199
00:06:36,150 --> 00:06:34,319
future which is useful for for deep

200
00:06:37,670 --> 00:06:36,160
space missions where you can't fly a new

201
00:06:39,670 --> 00:06:37,680
box up there you have to be able to

202
00:06:41,350 --> 00:06:39,680
reprogram it to fix it or reprogram it

203
00:06:43,270 --> 00:06:41,360
to get more capabilities and that's what

204
00:06:45,270 --> 00:06:43,280
we have in this box right so it sounds

205
00:06:47,990 --> 00:06:45,280
like it's in itself it's a learning

206
00:06:50,390 --> 00:06:48,000
platform for longer missions and deeper

207
00:06:52,070 --> 00:06:50,400
space missions yes definitely but no

208
00:06:54,150 --> 00:06:52,080
rest for the weary already working on

209
00:06:54,950 --> 00:06:54,160
new and better enhancements

210
00:06:56,469 --> 00:06:54,960
well

211
00:06:57,510 --> 00:06:56,479
they pay us to work here and that's what

212
00:07:00,550 --> 00:06:57,520
we do

213
00:07:03,189 --> 00:07:00,560

and and it's great to be able to

214
00:07:05,270 --> 00:07:03,199
to do something that benefits

215
00:07:06,469 --> 00:07:05,280
the agency in our country and and the

216
00:07:08,070 --> 00:07:06,479
world as a whole

217
00:07:09,510 --> 00:07:08,080
well while we have you tell us a little

218
00:07:11,830 --> 00:07:09,520
bit about yourself your background and

219
00:07:14,230 --> 00:07:11,840
how you ended up working at nasa

220
00:07:16,710 --> 00:07:14,240
well let's see i i'm a physics major i

221
00:07:17,589 --> 00:07:16,720
went to a small university in florida

222
00:07:19,909 --> 00:07:17,599
and

223
00:07:22,550 --> 00:07:19,919
i was given an opportunity to hire

224
00:07:23,430 --> 00:07:22,560
directly into nasa almost 30 years ago

225
00:07:25,350 --> 00:07:23,440
now

226
00:07:27,350 --> 00:07:25,360
and i remember the phone call it came

227
00:07:28,390 --> 00:07:27,360
while i was about to deliver a pizza to

228
00:07:31,670 --> 00:07:28,400
a table

229
00:07:32,870 --> 00:07:31,680
at a pizza place and um and it was an

230
00:07:34,950 --> 00:07:32,880
easy decision when he said do you want

231
00:07:37,110 --> 00:07:34,960
to come work here and i had that pizza

232
00:07:38,710 --> 00:07:37,120
and i said yes

233
00:07:40,309 --> 00:07:38,720
and so i was here within about a month

234
00:07:43,749 --> 00:07:40,319
and i had a job here and i've been

235
00:07:45,589 --> 00:07:43,759
working here and never had a dull moment

236
00:07:46,790 --> 00:07:45,599
well great it's fascinating uh

237
00:07:49,110 --> 00:07:46,800
fascinating stuff what you guys have

238
00:07:50,790 --> 00:07:49,120

done congratulations on a great uh

239
00:07:52,309 --> 00:07:50,800
project and you know hopefully things

240
00:07:53,909 --> 00:07:52,319
will continue smoothly you're gonna wrap

241
00:07:55,909 --> 00:07:53,919
it up next week and it sounds like more

242
00:07:57,189 --> 00:07:55,919
to come so thanks so much for joining us

243
00:07:59,350 --> 00:07:57,199
and sharing with us a little bit about

244
00:08:01,189 --> 00:07:59,360
the background about this big task again

245
00:08:02,950 --> 00:08:01,199
it's a big accomplishment for the whole