



1
00:00:45,260 --> 00:00:43,250
the crew arrived in their p38 training

2
00:00:48,560 --> 00:00:45,270
aircraft from the Johnson Space Center

3
00:00:49,970 --> 00:00:48,570
in Houston Texas this is a standard

4
00:00:53,720 --> 00:00:49,980
operation for the crew to come in about

5
00:00:55,610 --> 00:00:53,730
three days before launch their arrival

6
00:00:57,470 --> 00:00:55,620
words again at about 3:30 p.m. Eastern

7
00:00:59,990 --> 00:00:57,480
Time

8
00:01:04,549 --> 00:01:00,000
flying in the lead 2:38 of course is the

9
00:01:08,630 --> 00:01:04,559
commander Andy Allen and he flying in

10
00:01:14,450 --> 00:01:08,640
the back seat is one of our astronauts

11
00:01:21,560 --> 00:01:14,460
from the Italian space agency Umberto we

12
00:01:30,840 --> 00:01:27,210
pilot Scott Horowitz arrived flying the

13
00:01:40,520 --> 00:01:30,850

t-38 and flying in his backseat is

14

00:01:46,830 --> 00:01:43,830

claude nicollier is preparing to make

15

00:01:50,730 --> 00:01:46,840

his third trip into space today Maurizio

16

00:01:57,450 --> 00:01:50,740

Kelly mission specialists is making his

17

00:01:59,190 --> 00:01:57,460

a first trip into space today we've been

18

00:02:00,690 --> 00:01:59,200

kind of busy coming across the Gulf here

19

00:02:02,520 --> 00:02:00,700

but it's a beautiful day to fly and we

20

00:02:05,310 --> 00:02:02,530

look forward to a day like this on

21

00:02:08,340 --> 00:02:05,320

Thursday afternoon so we can get back up

22

00:02:11,430 --> 00:02:08,350

and go fly again this time it will be on

23

00:02:13,710 --> 00:02:11,440

Columbia the Kennedy Space Center launch

24

00:02:16,890 --> 00:02:13,720

team is proceeding with plans to launch

25

00:02:56,559 --> 00:02:16,900

the space shuttle Columbia scheduled for

26

00:03:01,250 --> 00:02:58,760

this is shuttle launch control at

27

00:03:04,370 --> 00:03:01,260

t-minus three hours and holding and we

28

00:03:05,600 --> 00:03:04,380

do have a live television of our flight

29

00:03:07,040 --> 00:03:05,610

crew on the third floor of the

30

00:03:10,070 --> 00:03:07,050

operations check-out building just

31

00:03:12,020 --> 00:03:10,080

departing their suit up room and making

32

00:03:15,229 --> 00:03:12,030

their way toward the elevator which will

33

00:03:16,640 --> 00:03:15,239

take them to the base of the room there

34

00:03:19,930 --> 00:03:16,650

is a wide range of interest on this

35

00:03:21,860 --> 00:03:19,940

mission and its international crew

36

00:03:23,750 --> 00:03:21,870

workers at Kennedy Space Center of

37

00:03:38,060 --> 00:03:23,760

course are all anxious to see this one

38

00:03:44,730 --> 00:03:42,630

and the commander Andy Allen has emerged

39

00:03:47,970 --> 00:03:44,740

from the building followed by his pilot

40

00:03:50,370 --> 00:03:47,980

Scott Horowitz and payload commander

41

00:03:53,840 --> 00:03:50,380

Franklin chang-diaz mission specialist

42

00:03:56,820 --> 00:03:53,850

Jeffrey Hoffman mission specialist

43

00:04:01,500 --> 00:03:56,830

Moiseyev Kelly and payload specialist

44

00:04:03,180 --> 00:04:01,510

Umberto we don't everything continues to

45

00:04:05,520 --> 00:04:03,190

go well as the launch team works to

46

00:04:07,280 --> 00:04:05,530

finalize all aspects of preparations for

47

00:04:12,480 --> 00:04:07,290

the launch of space shuttle Columbia at

48

00:04:14,100 --> 00:04:12,490

3:18 p.m. Eastern Time at this time the

49

00:04:15,540 --> 00:04:14,110

booster test conductor is verifying that

50

00:04:16,949 --> 00:04:15,550

the chamber pressures and the solid

51
00:04:22,320 --> 00:04:16,959
rocket motors is at the appropriate

52
00:04:23,700 --> 00:04:22,330
levels also air-to-ground voice checks

53
00:04:25,530 --> 00:04:23,710
have been completed between the crew and

54
00:04:28,050 --> 00:04:25,540
mission managers here in the firing room

55
00:04:31,380 --> 00:04:28,060
and the crew cabin close outs are about

56
00:04:32,700 --> 00:04:31,390
to begin all checks of the payloads

57
00:04:34,500 --> 00:04:32,710
instruments have been completed and

58
00:04:44,280 --> 00:04:34,510
engineers and managers are reporting no

59
00:04:48,230 --> 00:04:44,290
technical concerns the city often

60
00:04:50,190 --> 00:04:48,240
approve plan sheet I tell you to do it

61
00:04:51,540 --> 00:04:50,200
currently at the pad and here in the

62
00:04:53,100 --> 00:04:51,550
firing room all continues to go on

63
00:04:57,510 --> 00:04:53,110

schedule for the launch of space shuttle

64

00:05:00,180 --> 00:04:57,520

Columbia this afternoon at 3:18 at

65

00:05:19,920 --> 00:05:00,190

t-minus one hour 27 minutes and Counting

66

00:05:31,620 --> 00:05:23,999

we are continuing with the count not

67

00:05:37,050 --> 00:05:34,280

Alexis coho orbiter access arm retract

68

00:05:39,180 --> 00:05:37,060

the orbiter access arm is now being

69

00:05:41,250 --> 00:05:39,190

retracted away from the vehicle this is

70

00:05:43,980 --> 00:05:41,260

the walkway used by the crew to gain

71

00:05:45,570 --> 00:05:43,990

entry into and out of the vehicle and it

72

00:05:59,090 --> 00:05:45,580

can be returned to position within

73

00:06:03,700 --> 00:06:01,490

t-minus two minutes 30 seconds and

74

00:06:06,890 --> 00:06:03,710

counting

75

00:06:08,600 --> 00:06:06,900

and the gaseous oxygen vent hood is

76
00:06:21,200 --> 00:06:08,610
slowly being retracted away from the top

77
00:06:24,260 --> 00:06:22,850
we're transferring to your orbital

78
00:06:26,330 --> 00:06:24,270
internal power at this time

79
00:06:31,310 --> 00:06:26,340
Columbia is now laying off its three

80
00:06:37,060 --> 00:06:31,320
main onboard fuel cells coming up for a

81
00:06:40,600 --> 00:06:39,550
yellow cocoa products and we have a go

82
00:06:42,100 --> 00:06:40,610
for autosequence start

83
00:06:43,420 --> 00:06:42,110
Columbia's onboard computers have

84
00:06:51,160 --> 00:06:43,430
primary control of all the vehicles

85
00:07:01,059 --> 00:06:54,879
t-minus 15 seconds

86
00:07:09,550 --> 00:07:01,069
t-minus 12 11 10 9 8 7 we have a gopher

87
00:07:11,589 --> 00:07:09,560
manager 2 1 and we have liftoff of the

88
00:07:13,029 --> 00:07:11,599

space shuttle Columbia continuing Space

89

00:07:22,660 --> 00:07:13,039

Research through another satellite

90

00:07:27,800 --> 00:07:25,180

modulo Columbia

91

00:07:29,330 --> 00:07:27,810

Houston now controlling Colombia rolling

92

00:07:32,570 --> 00:07:29,340

on course for a twenty eight point five

93

00:07:38,089 --> 00:07:32,580

degree inclination of it it showing that

94

00:07:41,020 --> 00:07:38,099

for five percent on the left rajasthan

95

00:07:47,620 --> 00:07:43,930

Herschel bit up okay Justin we copy that

96

00:07:53,370 --> 00:07:47,630

was just up eyes on the PC cage and

97

00:07:55,750 --> 00:07:53,380

clever you're going throw up go alive

98

00:07:59,380 --> 00:07:55,760

three inches on board now back at full

99

00:08:01,420 --> 00:07:59,390

throttle the crew reporting a gauge on

100

00:08:03,430 --> 00:08:01,430

board however all indications for the

101
00:08:04,180 --> 00:08:03,440
Indians operating well again back at

102
00:08:07,090 --> 00:08:04,190
full throttle

103
00:08:11,490 --> 00:08:07,100
altitude now 69 thousand feet down range

104
00:08:17,790 --> 00:08:14,230
plumb be already traveling 2,000 miles

105
00:08:22,000 --> 00:08:17,800
per hour my controllers are standing by

106
00:08:49,560 --> 00:08:22,010
at two minutes after launch for burnout

107
00:08:53,319 --> 00:08:51,519
booster officer confirms a good

108
00:08:55,180 --> 00:08:53,329
separation of the twin side rockets

109
00:08:56,530 --> 00:08:55,190
Columbia now in its second stage main

110
00:08:59,680 --> 00:08:56,540
engines three main engines again

111
00:09:10,410 --> 00:08:59,690
operating well at full throttle Columbia

112
00:09:16,680 --> 00:09:14,819
okay GC Roger okay can Co your

113
00:09:18,420 --> 00:09:16,690

commanding is complete correct for now

114

00:09:19,680 --> 00:09:18,430

but we got to manage about five or so

115

00:09:22,139 --> 00:09:19,690

okay

116

00:09:23,370 --> 00:09:22,149

GC what's going to save the system all

117

00:09:26,460 --> 00:09:23,380

fly control is coming around the room

118

00:09:30,150 --> 00:09:26,470

for a go/no-go per the LCC prop go

119

00:09:32,639 --> 00:09:30,160

GNC Oh guidance go Fido go I'll come

120

00:09:35,190 --> 00:09:32,649

back to you GC DPS we're go hey load so

121

00:09:38,670 --> 00:09:35,200

you go we're go he con we're go if I go

122

00:09:43,139 --> 00:09:38,680

go in go go max go booster he'll

123

00:09:44,940 --> 00:09:43,149

sergeant yeah okay all flight

124

00:09:51,840 --> 00:09:44,950

controllers if you're still go green

125

00:09:55,110 --> 00:09:51,850

please on your status lights GC what's

126

00:09:57,150 --> 00:09:55,120

unsafe the mark APD Houston flight broke

127

00:09:58,740 --> 00:09:57,160

right yes sir the dump data we just had

128

00:10:00,389 --> 00:09:58,750

a chance to look at it it is the same

129

00:10:03,139 --> 00:10:00,399

signature we saw earlier this morning

130

00:10:07,319 --> 00:10:03,149

and with that confirmation we are go I

131

00:10:10,500 --> 00:10:07,329

thought that once electricity I copy

132

00:10:13,340 --> 00:10:10,510

that automatically ready Jim Walker then

133

00:10:27,540 --> 00:10:15,290

yes

134

00:10:27,550 --> 00:10:36,200

this often farm copy

135

00:10:41,360 --> 00:10:39,350

here's egg pop yeah my guidance we see a

136

00:10:46,160 --> 00:10:41,370

good roll laughter man Roger roll

137

00:10:51,320 --> 00:10:46,170

Columbia booster flight no flying me a

138

00:10:55,460 --> 00:10:51,330

message at East entirely on now 45% on

139

00:10:57,860 --> 00:10:55,470

the left we got good data flight if I

140

00:10:59,690 --> 00:10:57,870

just stand by or copy showing left

141

00:11:00,230 --> 00:10:59,700

engine and will for far so good I'll

142

00:11:01,820 --> 00:11:00,240

prick

143

00:11:04,850 --> 00:11:01,830

plumpie we're showing good engines good

144

00:11:06,920 --> 00:11:04,860

commands at all three darling down

145

00:11:15,280 --> 00:11:06,930

flight good good commands all talk about

146

00:11:20,630 --> 00:11:15,290

copy he taught me to confirm copy

147

00:11:22,550 --> 00:11:20,640

staying about Fido life I own nominal

148

00:11:25,900 --> 00:11:22,560

Miko no almost one required I'm go for

149

00:11:30,200 --> 00:11:25,910

the photo tto copy in praat Rob screw

150

00:11:33,110 --> 00:11:30,210

ROG Capcom Columbia Louisville Oh Miko

151

00:11:37,269 --> 00:11:33,120

Holmes one not requiring them you have a

152

00:11:39,740 --> 00:11:37,279

go for the photo DT oh good job guys

153

00:12:03,150 --> 00:11:39,750

okay I'm glad thanks much for everything

154

00:12:09,150 --> 00:12:06,180

yes I was saying it never works that

155

00:12:10,860 --> 00:12:09,160

fans in the sim riders I don't know I'm

156

00:12:12,720 --> 00:12:10,870

hoping that you could see some of the

157

00:12:14,310 --> 00:12:12,730

particulate material that was coming out

158

00:12:17,610 --> 00:12:14,320

of the payload Bay there was quite a bit

159

00:12:18,810 --> 00:12:17,620

of it mostly just little white particles

160

00:12:21,630 --> 00:12:18,820

as far as we could tell

161

00:12:23,190 --> 00:12:21,640

yes sir we saw that Jeff that's an

162

00:12:29,960 --> 00:12:23,200

excellent image you've downlinked that's

163

00:12:29,970 --> 00:12:38,970

what a great earth

164

00:12:38,980 --> 00:12:57,400

this one's going to go in all the movies

165

00:13:05,319 --> 00:13:00,749

and the Houston the DVCS activation

166

00:13:47,200 --> 00:13:05,329

steps to it for our TSS activation our

167

00:13:47,210 --> 00:13:57,630

that's a great view of the glovebox

168

00:14:03,449 --> 00:14:01,440

okay Dave yeah I'm setting up everything

169

00:14:06,269 --> 00:14:03,459

lights you can see the lights right here

170

00:14:08,940 --> 00:14:06,279

and we got the little internal box

171

00:14:11,069 --> 00:14:08,950

already connected everything looks good

172

00:14:13,949 --> 00:14:11,079

and at the next to the power just are

173

00:14:16,710 --> 00:14:13,959

ready to power everything up let me I

174

00:14:21,780 --> 00:14:16,720

read you also some filter numbers which

175

00:14:25,800 --> 00:14:21,790

I figure is supposed to write down okay

176

00:14:28,440 --> 00:14:25,810

Houston for TSS real mother set out is

177

00:14:30,630 --> 00:14:28,450

complete and I'm sure you see the final

178

00:14:33,329 --> 00:14:30,640

output temperature is forty five point

179

00:14:36,170 --> 00:14:33,339

one rather that's greater than fifty

180

00:14:38,340 --> 00:14:36,180

aside from that everything looks good

181

00:14:42,569 --> 00:14:38,350

and we're waiting for the vernier motor

182

00:14:45,030 --> 00:14:42,579

to come on board the crew members are

183

00:14:46,800 --> 00:14:45,040

behind in their timeline just about by

184

00:14:48,389 --> 00:14:46,810

two and a half hours or so after they've

185

00:14:52,199 --> 00:14:48,399

spent some time attempting to resolve

186

00:14:54,360 --> 00:14:52,209

some issues with a computer referred to

187

00:14:56,400 --> 00:14:54,370

as smartflex that's a computer that

188

00:14:59,639 --> 00:14:56,410

processes data from the tethered

189

00:15:02,189 --> 00:14:59,649

satellite system apparently the one of

190

00:15:04,199 --> 00:15:02,199

two cores on that satellite failed it

191

00:15:06,780 --> 00:15:04,209

failed automatically over to the second

192

00:15:10,130 --> 00:15:06,790

core and currently the right core of

193

00:15:13,710 --> 00:15:10,140

that smartflex computer is being used it

194

00:15:15,780 --> 00:15:13,720

appears to be operating as expected that

195

00:15:17,699 --> 00:15:15,790

will allow satellite activation to begin

196

00:15:19,380 --> 00:15:17,709

for the tethered satellite system the

197

00:15:21,689 --> 00:15:19,390

crew members also have been working with

198

00:15:23,490 --> 00:15:21,699

a second unit called the D dcs that's a

199

00:15:25,889 --> 00:15:23,500

dedicated display unit that graphically

200

00:15:27,329 --> 00:15:25,899

displays information about the major

201
00:15:29,939 --> 00:15:27,339
components of the tethered satellite

202
00:15:31,889 --> 00:15:29,949
system that unit is functioning however

203
00:15:35,750 --> 00:15:31,899
it is processing data at a very low

204
00:15:42,060 --> 00:15:35,760
level due to a low performance level

205
00:15:46,220 --> 00:15:42,070
Clementi is this then you are in the

206
00:15:52,019 --> 00:15:46,230
process of reconfiguring for KCA ops

207
00:15:54,360 --> 00:15:52,029
we're going to be up linking the DDS DCs

208
00:15:58,019 --> 00:15:54,370
timeline files for your one day late

209
00:16:01,640 --> 00:15:58,029
deploy and I got a procedure to read to

210
00:16:01,650 --> 00:17:16,980
yeah captain stand by one okay

211
00:17:23,650 --> 00:17:21,250
Columbia Huntsville for free as a 1 no

212
00:17:28,320 --> 00:17:23,660
response necessary you have a go for

213
00:18:31,000 --> 00:17:31,510

Columbia Houston like you to perform a

214

00:18:37,720 --> 00:18:34,230

come through Columbia the sets is

215

00:18:50,850 --> 00:18:37,730

activated in we're standing by for your

216

00:19:13,630 --> 00:18:53,370

we copy and we'll be doing that DEP

217

00:19:17,650 --> 00:19:15,400

go for deploy right now we're no

218

00:19:20,050 --> 00:19:17,660

constraint to fly we're at Nazca DPS or

219

00:19:24,580 --> 00:19:20,060

go Inc oh we're going to okay Capcom

220

00:19:26,170 --> 00:19:24,590

you're up go surgeon go KGC

221

00:19:30,580 --> 00:19:26,180

sounds like a good work let's make sure

222

00:19:36,130 --> 00:19:33,040

stand by Myrtle Columbia you are go for

223

00:19:50,330 --> 00:19:36,140

satellite attitude verification 3 - 14

224

00:19:56,780 --> 00:19:52,799

from BIA Houston you're go to unlatch

225

00:23:21,419 --> 00:20:00,299

okay David bye welcome aboard and go to

226

00:23:29,480 --> 00:23:26,789

will there be an attitude at 23 in two

227

00:23:30,690 --> 00:23:29,490

minutes will be an attitude GNC concurs

228

00:23:35,629 --> 00:23:30,700

okay

229

00:23:44,220 --> 00:23:40,680

there's an echo up here now Columbia we

230

00:23:54,419 --> 00:23:44,230

verify good flyaway attitude and or

231

00:23:56,159 --> 00:23:54,429

Bravo should look right now tail

232

00:23:58,259 --> 00:23:56,169

operators I skin don't get too

233

00:24:00,029 --> 00:23:58,269

mesmerized by the TV we are twenty

234

00:24:03,330 --> 00:24:00,039

minutes away from flyaway let's keep an

235

00:24:22,660 --> 00:24:03,340

eye on what's going on but it does look

236

00:24:27,580 --> 00:24:25,600

prop no Jin see we're gonna max tell

237

00:24:30,970 --> 00:24:27,590

people go you come go

238

00:24:35,950 --> 00:24:30,980

FAO oh hey loads no GPS no link Oh goo

239

00:24:37,570 --> 00:24:35,960

Capcom occurs go for deploy Columbia

240

00:24:42,960 --> 00:24:37,580

Houston you're go for release per

241

00:24:45,540 --> 00:24:42,970

performance gate 1 0 1 copy go and

242

00:24:52,380 --> 00:24:45,550

things look fine up here

243

00:24:57,390 --> 00:24:54,970

we will be uniform through the handover

244

00:25:00,280 --> 00:24:57,400

to Milan

245

00:25:03,010 --> 00:25:00,290

ok and we show both sets of thrusters on

246

00:25:04,780 --> 00:25:03,020

and we're looking good kicker thrusters

247

00:25:07,900 --> 00:25:04,790

and the APF cedars are both on looking

248

00:25:35,900 --> 00:25:07,910

good we concur thrusters and ApS heaters

249

00:25:40,210 --> 00:25:37,940

we're only about 1 degree out in y'all

250

00:25:42,590 --> 00:25:40,220

fight everything else is less than 1

251

00:25:44,690 --> 00:25:42,600

okay if you see the crew starting to

252

00:25:50,630 --> 00:25:44,700

chase the librarian like that LEM give

253

00:25:52,430 --> 00:25:50,640

me a blow-by-blow on foods we put the

254

00:25:54,650 --> 00:25:52,440

avoid words off we're putting the

255

00:25:57,289 --> 00:25:54,660

satellited y'all hold there's a slight

256

00:26:01,610 --> 00:25:57,299

drift towards the orbiter starboard and

257

00:26:03,740 --> 00:26:01,620

Andy is controlling it and we copy copy

258

00:28:20,490 --> 00:26:03,750

we see a tinker in line one off my

259

00:28:20,500 --> 00:28:26,850

a PS heater awfully happy

260

00:28:32,159 --> 00:28:29,830

hopefully we see the attention go way

261

00:28:35,850 --> 00:28:32,169

down but the Ted is still going outside

262

00:28:41,769 --> 00:28:35,860

very slight lateral oscillations but

263

00:28:47,700 --> 00:28:41,779

it's looking real good copy fine copy

264

00:28:53,019 --> 00:28:51,070

hi Chauncey go ahead

265

00:29:54,240 --> 00:28:53,029

Debbie ten is configured for the

266

00:30:01,799 --> 00:29:59,000

so the terror has broken at the apical

267

00:30:03,120 --> 00:30:01,809

the better has broken it is going away

268

00:30:05,490 --> 00:30:03,130

from us get it open

269

00:30:25,690 --> 00:30:05,500

get on the TV cord please get on the TV

270

00:30:35,409 --> 00:30:27,879

quite a photograph exploding away from

271

00:30:45,669 --> 00:30:35,419

us and Jeff we're tracking it with the

272

00:30:50,499 --> 00:30:45,679

radar and we do read zero tension okay

273

00:30:53,729 --> 00:30:50,509

Dave take all the tether is outside of

274

00:30:58,169 --> 00:30:53,739

the boom and well away from the orbiter

275

00:31:00,519 --> 00:30:58,179

we've got some feather inside the bill

276

00:31:03,159 --> 00:31:00,529

maybe it looks like about eight or ten

277

00:31:09,609 --> 00:31:03,169

meters so it broke inside the boom it

278

00:31:11,229 --> 00:31:09,619

seems we've got the brake on and we

279

00:31:13,139 --> 00:31:11,239

don't see any tether move this is laying

280

00:31:18,789 --> 00:31:13,149

inside the boom

281

00:31:21,069 --> 00:31:18,799

copy all Andy and stand by okay and Ian

282

00:31:24,310 --> 00:31:21,079

we want to completely verify you have a

283

00:31:26,409 --> 00:31:24,320

visual on the satellite and the tether

284

00:31:31,869 --> 00:31:26,419

is moving away from the shuttle and like

285

00:31:35,310 --> 00:31:31,879

those some words on that okay well we

286

00:31:38,019 --> 00:31:35,320

had a visual on the satellite up until

287

00:31:39,459 --> 00:31:38,029

up until we got into darkness here we'll

288

00:31:42,369 --> 00:31:39,469

go ahead try to pick it back up but at

289

00:31:44,499 --> 00:31:42,379

the time that we had it all the chatter

290

00:31:49,389 --> 00:31:44,509

was heading up towards the satellite and

291

00:31:51,190 --> 00:31:49,399

was well away from us stop Dave looks

292

00:31:52,659 --> 00:31:51,200

like we saw a laid out a lot so we could

293

00:31:55,979 --> 00:31:52,669

keep that for a little bit unless you

294

00:31:59,829 --> 00:31:55,989

guys are tracking it better than we are

295

00:32:05,169 --> 00:31:59,839

we have an image okay what you see now

296

00:32:07,629 --> 00:32:05,179

we were using the 350 and from you you

297

00:32:11,049 --> 00:32:07,639

are seeing a picture permit of Jeff's

298

00:32:14,049 --> 00:32:11,059

good image okay this is taken through

299

00:32:15,729 --> 00:32:14,059

the EOS 350 millimeter land we were

300

00:32:17,319 --> 00:32:15,739

photographing the shades of the tether

301
00:32:20,079 --> 00:32:17,329
and you can see it is starting to go

302
00:32:21,940 --> 00:32:20,089
slack now unfortunately in all the

303
00:32:28,449 --> 00:32:21,950
excitement somebody bumped the camera

304
00:32:33,310 --> 00:32:28,459
and we lost it okay that's the view that

305
00:32:35,589 --> 00:32:33,320
we had of it as it was drifting away and

306
00:32:37,310 --> 00:32:35,599
we got it for a minute or so before

307
00:32:39,440 --> 00:32:37,320
sunset

308
00:32:46,670 --> 00:32:39,450
yes sir well those are some tethered

309
00:32:48,320 --> 00:32:46,680
dynamics we did not want to see well we

310
00:32:50,380 --> 00:32:48,330
have demonstrated that you can generate

311
00:32:52,670 --> 00:32:50,390
a lot of electricity with tether and

312
00:32:54,890 --> 00:32:52,680
fortunately we've also demonstrated that

313
00:32:58,540 --> 00:32:54,900

you can use feathers to launch a

314

00:33:00,980 --> 00:32:58,550

satellite and put my child orbit and

315

00:33:02,990 --> 00:33:00,990

Fido concurs that was one of our

316

00:33:10,130 --> 00:33:03,000

objectives two of our objectives at

317

00:33:15,940 --> 00:33:10,140

least in fact we can see it picked up

318

00:33:15,950 --> 00:33:25,290

without using any propellant

319

00:33:32,040 --> 00:33:29,310

okay bear the Sun was setting and I

320

00:33:33,720 --> 00:33:32,050

guess we lucked out as far as being able

321

00:34:54,370 --> 00:33:33,730

to capture some of it before the Sun

322

00:36:37,940 --> 00:34:57,850

two minutes to the co e back with you on

323

00:37:20,330 --> 00:36:40,620

that's a beautiful shot of an amazing

324

00:37:26,380 --> 00:37:23,240

because we can't send you in a birthday

325

00:37:31,330 --> 00:37:26,390

cake but here it is

326

00:37:31,340 --> 00:37:38,200

okay thanks for all the well wishes

327

00:37:38,210 --> 00:38:13,020

sorry - what Mak

328

00:38:13,030 --> 00:38:29,780

I think we thought - good morning

329

00:38:33,770 --> 00:38:32,510

and ritzy oh this one has a higher flow

330

00:38:41,680 --> 00:38:33,780

rate and I guess that's why we've got

331

00:38:48,440 --> 00:38:41,690

more eyes on this one okay and I feel

332

00:38:54,560 --> 00:38:48,450

for that one door he'll and we're still

333

00:39:00,440 --> 00:38:54,570

seeing the displaced Columbia don't let

334

00:39:17,670 --> 00:39:00,450

that thing get loose the story was

335

00:39:24,950 --> 00:39:19,860

it gets any bigger we're going to leave

336

00:39:31,980 --> 00:39:28,170

Columbia Houston like you to perform a

337

00:39:37,710 --> 00:39:31,990

maneuver for SLA cow at zero five hours

338

00:39:40,020 --> 00:39:37,720

that's just in a few minutes proper

339

00:40:21,520 --> 00:39:40,030

doable for any cow there were five hours

340

00:40:38,940 --> 00:40:25,440

and thanks Mauricio we do have live TV

341

00:40:47,450 --> 00:40:43,049

Oh Mia were 1 plus 30 from the co e back

342

00:40:49,770 --> 00:40:47,460

with you at 0 641 no response required

343

00:41:40,500 --> 00:40:49,780

we're with you on the mid-deck Franklin

344

00:41:40,510 --> 00:41:52,070

on my mark now 3 2 1 my dignity is up

345

00:41:52,080 --> 00:42:02,990

she can either release it

346

00:42:03,000 --> 00:42:17,410

- shooting up with

347

00:42:17,420 --> 00:42:28,030

pretty fast bad defense

348

00:44:29,230 --> 00:42:32,170

okay the filter stops on the top cameras

349

00:44:33,970 --> 00:44:31,810

at Columbia Houston we're two minutes to

350

00:46:32,510 --> 00:44:33,980

a teacher silhouettes will pick you back

351
00:46:32,520 --> 00:46:36,450
hello folks

352
00:47:02,010 --> 00:46:38,700
Oh Jeff hi Claude we're looking in the

353
00:47:10,930 --> 00:47:07,030
the Atlantis Columbia Columbia Atlantis

354
00:47:12,970 --> 00:47:10,940
have you loud and clear any Tommy Wright

355
00:47:15,460 --> 00:47:12,980
jelly yeah how you doing we're just uh

356
00:47:17,140 --> 00:47:15,470
we're passively though right now will be

357
00:47:23,350 --> 00:47:17,150
over top of the Cape and I'm Adam and

358
00:47:24,730 --> 00:47:23,360
it's a half Oh Andy you all been up

359
00:47:36,330 --> 00:47:24,740
there too long we're missing you down

360
00:47:43,290 --> 00:47:40,590
the Amazon River of Brazil clearly

361
00:52:44,330 --> 00:47:43,300
visible with the Sun glint off of the

362
00:52:48,420 --> 00:52:46,380
environmental systems officer here in

363
00:52:51,240 --> 00:52:48,430

Mission Control reporting very good

364

00:52:53,520 --> 00:52:51,250

cooling for the orbiter as it passes now

365

00:52:57,200 --> 00:52:53,530

down to the final phase of its entry

366

00:52:59,430 --> 00:52:57,210

less than 11 minutes away from touchdown

367

00:53:01,170 --> 00:52:59,440

this view of Columbia from long-range

368

00:53:03,720 --> 00:53:01,180

tracking cameras at the Kennedy Space

369

00:53:18,400 --> 00:53:03,730

Center showing a very stable vehicle now

370

00:53:23,810 --> 00:53:20,600

plumpy uh we show you on energy

371

00:53:26,030 --> 00:53:23,820

approaching the hack wins our a330

372

00:53:35,920 --> 00:53:26,040

fifteen gusts tonight teen that's pretty

373

00:53:41,210 --> 00:53:38,800

Alan about to flare up the orbiters nose

374

00:53:57,920 --> 00:53:41,220

landing gear now beginning to be

375

00:54:12,560 --> 00:54:01,819

main gear touchdown Horowitz now

376

00:54:16,590 --> 00:54:14,580

nose gear touchdown

377

00:54:18,000 --> 00:54:16,600

Colombia now rolling out on runway three

378

00:54:19,860 --> 00:54:18,010

three at the Kennedy Space Center to

379

00:54:25,290 --> 00:54:19,870

wrap up a six and a half million mile

380

00:54:25,300 --> 00:55:00,400

Oh

381

00:55:08,440 --> 00:55:03,039

Suzanne someday will stop at the Kennedy

382

00:55:10,599 --> 00:55:08,450

Space Center Roger we copy your elation

383

00:55:13,740 --> 00:55:10,609

welcome back any great landing and we'll

384

00:55:16,089 --> 00:55:13,750

get your post-landing deltas shortly

385

00:55:20,700 --> 00:55:16,099

Justin Columbia standing by words

386

00:55:43,839 --> 00:55:24,279

Roger dock hydraulic load test if not

387

00:55:49,670 --> 00:55:46,220

I'm glide slope on Noi

388

00:55:54,349 --> 00:55:49,680

copy Columbia show you on glide slope on

389

00:55:54,769 --> 00:55:54,359

centerline daddy's usin their field in

390

00:56:18,910 --> 00:55:54,779

sight

391

00:56:27,039 --> 00:56:21,640

who said Sunday will stop at the Kennedy

392

00:56:29,230 --> 00:56:27,049

Space Center Roger we copy your elation

393

00:56:31,059 --> 00:56:29,240

welcome back any great landing and we'll

394

00:56:32,980 --> 00:56:31,069

get your post-landing deltas shortly

395

00:56:35,349 --> 00:56:32,990

okay max any immediate post-landing

396

00:56:37,210 --> 00:56:35,359

deltas not in flight eagle and he comm

397

00:56:38,799 --> 00:56:37,220

none will be going on ammonia real soon

398

00:56:39,250 --> 00:56:38,809

here though we'll get back with you copy

399

00:56:42,190 --> 00:56:39,260

that

400

00:56:43,180 --> 00:56:42,200

okay no immediate Delta's Capcom you

401

00:56:46,089 --> 00:56:43,190

fail to pick up with the postman

402

00:56:48,339 --> 00:56:46,099

procedures lamia

403

00:56:49,480 --> 00:56:48,349

Houston no media Delta's you have a go