
TOUR A PLANE THAT
LAUNCHES ROCKETS

1
00:00:00,000 --> 00:00:00,980
HELLO AND WELCOME

2
00:00:01,000 --> 00:00:03,917
WE ARE HERE AT CAPE CANAVERAL

3
00:00:03,937 --> 00:00:05,485
AIR FORCE STATION IN FLORIDA.

4
00:00:05,505 --> 00:00:09,556
GETTING READY FOR THE LAUNCH OF NASA's

5
00:00:09,576 --> 00:00:10,924
IONOSPHERIC CONNECTION EXPLORER. THAT IS ICON FOR SHORT.

6
00:00:10,944 --> 00:00:12,692
I AM KAREN FOX AND WE'RE GOING TO

7
00:00:12,712 --> 00:00:15,328
BE TALKING ABOUT THIS PLANE

8
00:00:15,348 --> 00:00:18,198
RIGHT BEHIND ME. THAT'S AN L1011.

9
00:00:18,218 --> 00:00:19,866
THAT'S GOING TO HELP LAUNCH ICON UP INTO SPACE

10
00:00:19,886 --> 00:00:22,602
WE'RE GOING TO GO INSIDE AND

11
00:00:22,622 --> 00:00:22,936
WE'RE GOING TO WALK AROUND.

12
00:00:22,956 --> 00:00:25,505
BUT BEFORE THAT, WE ARE TALKING TO

13
00:00:25,525 --> 00:00:27,407

SCOTT ENGLAND. HE IS THE PROJECT

14
00:00:27,427 --> 00:00:29,476
SCIENTIST FOR ICON FROM VIRGINIA

15
00:00:29,496 --> 00:00:34,114
TECH IN BLACKSBERG, VIRGINIA.

16
00:00:35,915 --> 00:00:34,447
WELCOME.

17
00:00:35,935 --> 00:00:39,420
>> START OUT JUST TELLING US ABOUT THE

18
00:00:39,440 --> 00:00:40,420
IONOSPHERIC CONNECTION EXPLORER.

19
00:00:40,440 --> 00:00:42,555
WHAT IS THE IONOSPHERE?

20
00:00:42,575 --> 00:00:45,024
>> THE IONOSPHERE IS THE VERY TOP OF EARTH'S ATMOSPHERE.

21
00:00:45,044 --> 00:00:47,360
IT'S THIS REGION WHERE OUR ATMOSPHERE REACHES SPACE.

22
00:00:47,380 --> 00:00:51,064
THE FIRST REGION THAT SUNLIGHT

23
00:00:51,084 --> 00:00:52,150
HITS WHEN IT REACHES OUR ATMOSPHERE.

24
00:00:52,170 --> 00:00:53,580
AND AT THESE ALTITUDES

25
00:00:53,600 --> 00:00:54,800
THE SUNLIGHT IS ABLE TO BREAK APART

26
00:00:54,820 --> 00:00:59,070
THE ATOMS AND MOLECULES AND

27
00:00:59,090 --> 00:01:00,870
ENERGIZE THEM AND IONIZE THEM

28
00:01:00,890 --> 00:01:03,140
FORMING CHARGED

29
00:01:03,160 --> 00:01:04,610
PARTICLES AND WE CALL THESE CHARGED PARTICLES THE IONOSPHERE.

30
00:01:04,630 --> 00:01:06,045
BECAUSE THEY'RE CHARGED

31
00:01:06,065 --> 00:01:07,440
THIS CAN INTERACT WITH

32
00:01:07,460 --> 00:01:09,480
SPACECRAFT AND RADIO SIGNALS SUCH AS

33
00:01:09,500 --> 00:01:12,852
AS GPS THAT TRY TO PASS THROUGH THIS REGION.

34
00:01:12,872 --> 00:01:14,650
WE WANT TO UNDERSTAND THESE

35
00:01:14,670 --> 00:01:16,890
CHARGE PARTICLES AND THEIR

36
00:01:16,910 --> 00:01:17,250
BEHAVIOR.

37
00:01:17,270 --> 00:01:18,850
ANOTHER PHENOMENA THAT WE GET IN

38
00:01:18,870 --> 00:01:21,990

THIS REGION AS THE SUNLIGHT

39
00:01:22,010 --> 00:01:24,030
ENERGIZES AND IONIZES THE

40
00:01:24,050 --> 00:01:27,460
PARTICLES THEY'RE ABLE TO EMIT

41
00:01:27,480 --> 00:01:28,100
LIGHT.

42
00:01:28,120 --> 00:01:29,800
WE CALL THIS AIRGLOW AND THIS

43
00:01:29,820 --> 00:01:31,330
IS A REALLY FASCINATING PHENOMENA OF THIS REGION.

44
00:01:31,350 --> 00:01:33,230
AN EXAMPLE OF AIRGLOW THAT PEOPLE MAY HAVE

45
00:01:33,250 --> 00:01:35,370
SEEN CALLED AURORA WHICH WE

46
00:01:35,390 --> 00:01:37,470
GET NEAR THE NORTH AND SOUTH

47
00:01:37,490 --> 00:01:39,910
POLE AND THAT'S A VERY BRIGHT FORM OF AIRGLOW

48
00:01:39,930 --> 00:01:42,180
BUT THERE IS ACTUALLY AIRGLOW ALL OVER

49
00:01:42,200 --> 00:01:43,650
THE PLANET EVEN ABOVE US RIGHT

50
00:01:43,670 --> 00:01:43,910
NOW.

51
00:01:43,930 --> 00:01:45,350
>> IS IT SOMETHING WE CAN SEE UP THERE

52
00:01:45,370 --> 00:01:46,085
RIGHT NOW?

53
00:01:46,105 --> 00:01:48,120
>> IF WE WENT ABOVE THE

54
00:01:48,140 --> 00:01:49,320
ATMOSPHERE LIKE ASTRONAUTS AT THE SPACE STATION

55
00:01:49,340 --> 00:01:51,320
AND THEY LOOK OUTSIDE OF THE SPACE

56
00:01:51,340 --> 00:01:52,792
STATION AN AT NIGHT THEY SEE

57
00:01:52,812 --> 00:01:55,290
THIS BEAUTIFUL GREEN GLOW, RIGHT

58
00:01:55,310 --> 00:01:56,329
AROUND 60 MILES ABOVE THE

59
00:01:56,349 --> 00:01:59,090
SURFACE ON THE EDGE OF SPACE.

60
00:01:59,110 --> 00:02:00,930
>> SO YOU'VE EXPLAINED ABOUT THE

61
00:02:00,950 --> 00:02:02,300
IONOSPHERE AND HOW THERE

62
00:02:02,320 --> 00:02:04,400
IS A LOT GOING ON THERE AND WE

63
00:02:04,420 --> 00:02:06,330

HAVE TO KNOW ABOUT IT TO PROTECT

64
00:02:06,350 --> 00:02:08,140
OUR COMMUNICATIONS IN SPACE AND

65
00:02:08,160 --> 00:02:09,540
ASTRONAUTS ARE UP THERE TOO.

66
00:02:09,560 --> 00:02:11,440
WE'RE LOOKING OUT FOR THEM.

67
00:02:11,460 --> 00:02:12,810
TELL US WHAT ICON IS BRINGING TO

68
00:02:12,830 --> 00:02:13,746
THE TABLE.

69
00:02:13,766 --> 00:02:15,081
WHAT KIND OF OBSERVATIONS WILL

70
00:02:15,101 --> 00:02:16,040
IT HELP WITH?

71
00:02:16,060 --> 00:02:18,785
>> THIS REGION AROUND 60 MILES

72
00:02:18,805 --> 00:02:22,020
OFF THE SURFACE IS REALLY

73
00:02:22,040 --> 00:02:23,420
INACCESSIBLE. IT'S MUCH TOO HIGH

74
00:02:23,440 --> 00:02:25,750
TO FLY AN AIRPLANE LIKE THIS AND GET

75
00:02:25,770 --> 00:02:27,260
MEASUREMENTS. IT'S ALSO TOO LOW TO FLY A

76
00:02:27,280 --> 00:02:30,060
SPACECRAFT THROUGH THIS REGION.

77
00:02:30,080 --> 00:02:31,690
IT'S ALSO THE REGION WHERE WE

78
00:02:31,710 --> 00:02:32,460
THINK THE REAL CONNECTION

79
00:02:32,480 --> 00:02:35,200
BETWEEN OUR ATMOSPHERE AND THE

80
00:02:35,220 --> 00:02:37,130
IONOSPHERE IS TAKING

81
00:02:37,150 --> 00:02:37,437
PLACE.

82
00:02:37,457 --> 00:02:42,240
ICON WILL MAKE USE OF THIS AIR

83
00:02:42,260 --> 00:02:44,440
GLOW SO ICON WILL BE FLYING IN

84
00:02:44,460 --> 00:02:46,940
LOW-EARTH ORBIT AROUND THE TOP OF THE IONOSPHERE, MAKING

85
00:02:46,960 --> 00:02:48,410
MEASUREMENTS FROM ITS ALTITUDE AND DOWN INTO THIS

86
00:02:48,430 --> 00:02:50,010
INACCESSIBLE REGION AND TAKING

87
00:02:50,030 --> 00:02:52,310
IMAGES AND SPECTRA OF THIS AIRGLOW AND

88
00:02:52,330 --> 00:02:54,750

SEEING HOW IS THE AIR MOVING,

89
00:02:54,770 --> 00:02:56,420
WHAT'S THE WIND SPEED, WHAT IS THE

90
00:02:56,440 --> 00:02:57,750
TEMPERATURE AND THEN WHERE ARE

91
00:02:57,770 --> 00:02:58,790
THESE CHARGE PARTICLES BEING

92
00:02:58,810 --> 00:03:00,320
FORMED AND HOW ARE THEY MOVING

93
00:03:00,340 --> 00:03:02,290
AND REALLY SHOW US THIS

94
00:03:02,310 --> 00:03:03,220
CONNECTION BETWEEN THE NEUTRAL

95
00:03:03,240 --> 00:03:05,090
PART OF THE ATMOSPHERE THAT WE

96
00:03:05,110 --> 00:03:09,760
LIVE IN AND THESE IONS ON THE

97
00:03:09,780 --> 00:03:10,530
EDGE OF SPACE.

98
00:03:10,550 --> 00:03:11,570
>> SO YOU'RE DESCRIBING THIS AREA, IT'S CHANGING ALL THE TIME

99
00:03:11,590 --> 00:03:13,270
THERE'S A LOT GOING ON THERE.

100
00:03:13,290 --> 00:03:14,640
WHAT IS MAKING IT CHANGE?

101
00:03:14,660 --> 00:03:15,870
WHAT's DRIVING ALL THAT?

102
00:03:15,890 --> 00:03:20,040
>> SO, WE KNOW THAT THE IONOSPHERE IS FORMED

103
00:03:20,060 --> 00:03:21,880
WHEN SUNLIGHT HITS THE

104
00:03:21,900 --> 00:03:24,010
ATMOSPHERE AND BREAKS APART THE

105
00:03:24,030 --> 00:03:24,480
ATOMS AND MOLECULES.

106
00:03:24,500 --> 00:03:26,650
WE KNOW THAT THE SUN PLAYS A REALLY

107
00:03:26,670 --> 00:03:31,190
IMPORTANT ROLE IN TRANSFORMING

108
00:03:31,210 --> 00:03:33,220
THE IONOSPHERE.

109
00:03:33,240 --> 00:03:35,190
BUT OVER THE LAST TEN YEARS OR SO, WE'VE HAD THESE OBSERVATIONS OF THE IONOSPHERE

110
00:03:35,210 --> 00:03:38,030
WE CAN REALLY SAY THAT IT's NOT

111
00:03:38,050 --> 00:03:40,090
JUST CHANGES IN THE SUN THAT ARE

112
00:03:40,110 --> 00:03:42,360
DRIVING WHAT WE SEE IN THE EYE

113
00:03:42,380 --> 00:03:43,500

IONOSPHERE.

114
00:03:43,520 --> 00:03:45,300
THROUGH PIECING TOGETHER THESE OBSERVATIONS OF THE IONOSPHERE

115
00:03:45,320 --> 00:03:48,070
AND BRINGING TOGETHER

116
00:03:48,090 --> 00:03:49,770
OBSERVATIONS OF THE ATMOSPHERE AT MUCH

117
00:03:49,790 --> 00:03:53,680
LOWER ALTITUDES, DOWN NEAR THE SURFACE HERE, WE CAN SEE

118
00:03:53,700 --> 00:03:56,680
REFLECTIONS OF PATTERNS WE SEE,

119
00:03:56,700 --> 00:03:57,880
ESPECIALLY IN LARGE SCALE

120
00:03:57,900 --> 00:04:00,620
WEATHER SYSTEMS LIKE TROPICAL

121
00:04:00,640 --> 00:04:01,420
THUNDERSTORMS AND HOW THEY

122
00:04:01,440 --> 00:04:02,650
CHANGE OVER TIME.

123
00:04:02,670 --> 00:04:05,220
WE THEN SEE AN IMPRINT OF THAT

124
00:04:05,240 --> 00:04:07,090
ON WHERE THE CHARGE PARTICLES

125
00:04:07,110 --> 00:04:08,560
ARE IN THE IONOSPHERE.

126
00:04:08,580 --> 00:04:10,690
WHAT WE THINK IS HAPPENING IS

127
00:04:10,710 --> 00:04:13,333
NOT THAT THE TROPICAL WEATHER

128
00:04:13,353 --> 00:04:14,560
PATTERNS ARE REACHING ALL THE

129
00:04:14,580 --> 00:04:16,600
WAY UP TO THE IONOSPHERE DIRECTLY BUT WE THINK

130
00:04:16,620 --> 00:04:20,000
THAT THEIR INFORMATION IS BEING

131
00:04:20,020 --> 00:04:22,370
COMMUNICATED THERE THROUGH

132
00:04:22,390 --> 00:04:23,500
ATMOSPHERIC WAVES.

133
00:04:23,520 --> 00:04:24,877
LIKE THIS AIRPLANE BEHIND US IF

134
00:04:24,897 --> 00:04:26,410
YOU SEE IT UP IN THE SKY YOU CAN

135
00:04:26,430 --> 00:04:27,410
HEAR ITS ENGINES.

136
00:04:27,430 --> 00:04:28,540
WHAT IS HAPPENING IS NOT THAT

137
00:04:28,560 --> 00:04:29,882
THE AIR FROM THE ENGINES IS

138
00:04:29,902 --> 00:04:32,018

COMING DOWN TO YOUR EARS, BUT

139
00:04:32,038 --> 00:04:33,410
SOUND WAVES ARE TRAVELING

140
00:04:33,430 --> 00:04:35,250
THROUGH THE ATMOSPHERE FROM THE

141
00:04:35,270 --> 00:04:37,890
ENGINES BRINGING THAT ENERGY AND

142
00:04:37,910 --> 00:04:38,992
THAT INFORMATION TO YOU AND WE

143
00:04:39,012 --> 00:04:42,160
THINK THE SAME SORT OF THING IS

144
00:04:42,180 --> 00:04:44,190
HAPPENING VERY LARGE SCALES

145
00:04:44,210 --> 00:04:47,400
BETWEEN THESE LARGE-SCALE LOWER

146
00:04:47,420 --> 00:04:50,400
ATMOSPHERE WEATHER SYSTEMS

147
00:04:50,420 --> 00:04:51,530
COMMUNICATING ENERGY AND ENERGY

148
00:04:51,550 --> 00:04:53,539
UP TO THE IONOSPHERE

149
00:04:53,559 --> 00:04:55,541
THROUGH ATMOSPHERIC WAVES. AND ICON'S GOING TO GET US

150
00:04:55,561 --> 00:04:57,810
OBSERVATIONS OF THESE BY MEASURING HOW THE

151
00:04:57,830 --> 00:05:00,446
ATMOSPHERE IS MOVING AND HOW THE

152
00:05:00,466 --> 00:05:01,848
IONOSPHERE IS REALLY RESPONDING AND

153
00:05:01,868 --> 00:05:02,682
HOW THE CONNECTION TAKES PLACE.

154
00:05:02,702 --> 00:05:03,483
>> WELL, THANK YOU SO MUCH.

155
00:05:03,503 --> 00:05:06,319
WE'RE LOOKING FORWARD TO

156
00:05:06,339 --> 00:05:08,154
LEARNING MORE ABOUT HOW THE

157
00:05:08,174 --> 00:05:10,556
TERRESTRIAL WEATHER AND SPACE

158
00:05:10,576 --> 00:05:11,157
WEATHER ARE CONNECTED WITH ICON.

159
00:05:11,177 --> 00:05:11,724
THANK YOU FOR BEING HERE TODAY.

160
00:05:11,744 --> 00:05:12,425
>> THANK YOU.

161
00:05:12,445 --> 00:05:14,093
>> ALRIGHT. WE'RE NOW GOING TO GO OVER TO

162
00:05:14,113 --> 00:05:15,795
THE PLANE AND LEARN A LITTLE BIT

163
00:05:15,815 --> 00:05:22,035

MORE. WE'RE GOING TO GO TALK TO ED DUNLAP WITH

164
00:05:22,055 --> 00:05:23,136
NORTHROP GRUMMAN. COME ON ALONG!

165
00:05:23,156 --> 00:05:28,307
WE ARE TALKING TO ED DUNLAP WITH

166
00:05:28,327 --> 00:05:29,342
NORTHROP GRUMMAN.

167
00:05:29,362 --> 00:05:30,777
HE MANAGES THE PLANE OPERATIONS.

168
00:05:30,797 --> 00:05:32,679
YOU STILL HAVE BEHIND US THE AIRPLANE

169
00:05:32,699 --> 00:05:35,848
AND OBVIOUSLY THIS IS NOT A

170
00:05:35,868 --> 00:05:37,216
STANDARD LAUNCH -- PEOPLE THINK

171
00:05:37,236 --> 00:05:39,385
OF A ROCKET GOING INTO SPACE.

172
00:05:39,405 --> 00:05:40,753
SO, TELL ME ABOUT THIS PLANE AND HOW

173
00:05:40,773 --> 00:05:42,188
IT'S GOING TO GET ICON INTO SPACE.

174
00:05:42,208 --> 00:05:46,492
>> SO, FIRST OF ALL THIS IS A LOCKHEED TRI-STAR

175
00:05:46,512 --> 00:05:48,428
MEANING IT HAS 3 ENGINES.

176
00:05:48,448 --> 00:05:50,763
IT WAS ORIGINALLY DESIGNED TO

177
00:05:50,783 --> 00:05:52,932
CARRY 3-400 PASSENGERS BUT MY

178
00:05:52,952 --> 00:05:56,636
COMPANY PURCHASED IT AND MODIFIED IT COMPLETELYCOMPANY PURCHASED IT AND MODIFIED

179
00:05:56,656 --> 00:05:58,471
STRUCTURALLY, SO THAT IT CAN MOUNT THIS 52,000-POUND ROCKET TO

180
00:05:58,491 --> 00:06:00,907
THE BELLY OF THE AIRPLANE.

181
00:06:00,927 --> 00:06:04,010
WHAT WE WILL DO, ON DAY OF LAUNCH, IS WE'LL TAKE OFF, FLY UP TO

182
00:06:04,030 --> 00:06:05,411
39,000 FEET WHICH IS OUR DROP

183
00:06:05,431 --> 00:06:06,479
ALTITUDE AND THEN THE AIRPLANE

184
00:06:06,499 --> 00:06:10,149
IS ESSENTIALLY THE FIRST STAGE

185
00:06:10,169 --> 00:06:13,680
SO IT'S A REUSABLE FIRST STAGE. WE CAN BRING IT BACK

186
00:06:13,700 --> 00:06:13,690
AND USE IT AGAIN AND AGAIN. THIS WILL BE OUR 38TH LAUNCH OFF

187
00:06:13,710 --> 00:06:16,980
OF THE L-1011. AND

188
00:06:17,000 --> 00:06:18,750

IN THAT TIME PERIOD BECAUSE NOT

189
00:06:18,770 --> 00:06:20,350
EVERY SATELLITE IS A

190
00:06:20,370 --> 00:06:23,290
SINGLE SATELLITE, THIS WILL BE

191
00:06:23,310 --> 00:06:25,790
THE 91ST SATELLITE THAT WE'LL LAUNCH OFF THIS AIRCRAFT.

192
00:06:25,810 --> 00:06:28,130
>> NOW, YOU SAID IT'S A PASSENGER

193
00:06:28,150 --> 00:06:28,430
PLANE. CAN YOU TELL ME A LITTLE MORE ABOUT THE HISTORY OF THIS PLANE?

194
00:06:28,450 --> 00:06:32,830
>> IT WAS BUILT IN 1974 AND FOR

195
00:06:32,850 --> 00:06:34,340
15 YEARS IT SERVED AIR CANADA

196
00:06:34,360 --> 00:06:36,540
AND THOUSANDS OF PEOPLE ALL

197
00:06:36,560 --> 00:06:37,440
ACROSS NORTH AMERICA, EVEN

198
00:06:37,460 --> 00:06:38,370
SPENT TIME IN INDIA, FLYING AROUND.

199
00:06:38,390 --> 00:06:39,779
WE PURCHASED IT AND HAD BEEN

200
00:06:39,799 --> 00:06:41,140
USING IT EVER SINCE.

201
00:06:41,160 --> 00:06:43,340
>> AND INSIDE, WHEN WE GO IN

202
00:06:43,360 --> 00:06:45,110
THERE WILL IT STILL HAVE SEATS? WHAT DOES IT LOOK

203
00:06:45,130 --> 00:06:48,550
LIKE IN THERE? >> ACTUALLY BECAUSE OF THE

204
00:06:48,570 --> 00:06:49,920
MODIFICATIONS, THIS AIRPLANE'S

205
00:06:49,940 --> 00:06:51,720
SOLE PURPOSE IS TO GET UP TO ALTITUDE AND

206
00:06:51,740 --> 00:06:52,050
DROP THE ROCKET.

207
00:06:52,070 --> 00:06:55,990
ALL THE PASSENGER ACCOMMODATIONS

208
00:06:56,010 --> 00:06:58,030
EXCEPT ONE LAVATORY, EVERYTHING

209
00:06:58,050 --> 00:07:00,230
ELSE WAS TAKEN OUT TO LIGHTEN

210
00:07:00,250 --> 00:07:00,630
THE LOAD TO GET TO ALTITUDE QUICKLY.

211
00:07:00,650 --> 00:07:02,401
THERE ARE ABOUT A DOZEN

212
00:07:02,421 --> 00:07:03,236
PASSENGER SEATS YOU'LL SEE IN

213
00:07:03,256 --> 00:07:04,871

THE CABIN AND THAT's BECAUSE WE

214
00:07:04,891 --> 00:07:08,770
DO -- LIKE WHEN WE CAME HERE

215
00:07:08,790 --> 00:07:10,770
FROM CALIFORNIA WE DID A CAPTIVE

216
00:07:10,790 --> 00:07:13,710
CARRY FLIGHT. SO WE HAVE EXTRA CREW MEMBERS, ROCKET

217
00:07:13,730 --> 00:07:15,340
TECHNICIANS AND ENGINEERS THAT ACCOMPANY US.

218
00:07:15,360 --> 00:07:16,610
THERE'S ALWAYS A POSSIBILITY WE MIGHT

219
00:07:16,630 --> 00:07:18,384
HAVE TO OFF LAND AND EVERYTHING

220
00:07:18,404 --> 00:07:20,010
ON BOARD OF THE AIRPLANE WE MAY

221
00:07:20,030 --> 00:07:21,880
NEED FOR ANY CONTINGENCY THAT

222
00:07:21,900 --> 00:07:22,480
MAY HAPPEN.

223
00:07:22,500 --> 00:07:24,320
>> ALRIGHT, YOU TOLD US ABOUT THE PLANE.

224
00:07:24,340 --> 00:07:25,992
TELL US ABOUT THAT ROCKET.

225
00:07:26,012 --> 00:07:27,690
>> THIS IS A GREAT ROCKET.

226
00:07:27,710 --> 00:07:30,120
IT'S A 3-STAGE SOLID BOOSTER ROCKET.

227
00:07:30,140 --> 00:07:33,130
YOU CAN SEE THE FIRST STAGE,

228
00:07:33,150 --> 00:07:34,033
SEPARATION POINT JUST IN FRONT

229
00:07:34,053 --> 00:07:34,700
OF THE WINGS.

230
00:07:34,720 --> 00:07:37,570
THAT GETS TO 180,000 FEET.

231
00:07:37,590 --> 00:07:39,070
THERE'S A SECOND STAGE, THE METAL RING, GETS IT OUT

232
00:07:39,090 --> 00:07:42,008
OF EARTH's ORBIT AND THEN THE

233
00:07:42,028 --> 00:07:43,500
THIRD STAGE GETS IT INTO ITS

234
00:07:43,520 --> 00:07:44,410
PROPER ORBIT.

235
00:07:44,430 --> 00:07:45,770
THE SATELLITE IS IN THE VERY

236
00:07:45,790 --> 00:07:46,940
FRONT OF IT, AND IN THIS PARTICULAR

237
00:07:46,960 --> 00:07:49,480
CASE, IT's GOING UP TO 360 MILES

238
00:07:49,500 --> 00:07:51,150

IN SPACE.

239
00:07:51,170 --> 00:07:51,880
>> THANK YOU SO MUCH.

240
00:07:51,900 --> 00:07:53,486
WE'LL GO INSIDE NOW TO CHECK OUT

241
00:07:53,506 --> 00:07:53,920
THAT PLANE.

242
00:07:53,940 --> 00:08:04,490
I ENJOYED TALKING TO YOU.

243
00:08:04,510 --> 00:08:06,190
THANKS A LOT.

244
00:08:06,210 --> 00:08:08,260
SO NOW HERE WE ARE ABOUT TO

245
00:08:08,280 --> 00:08:10,200
ENTER THE L-1011 AND TALK TO THE

246
00:08:10,220 --> 00:08:12,505
CREW WHO WILL BE WITH THE PLANE

247
00:08:12,525 --> 00:08:13,139
DURING THE LAUNCH.

248
00:08:13,159 --> 00:08:15,640
WE ARE TALKING NOW TO JIM

249
00:08:15,660 --> 00:08:18,040
STOWERS, HE IS THE LAUNCH PLANEL

250
00:08:18,060 --> 00:08:19,810
OPERATOR WHO WILL BE IN THIS

251
00:08:19,830 --> 00:08:22,410
PLANE WHEN ICON LAUNCHES.

252
00:08:22,430 --> 00:08:24,680
HERE WE ARE, I SEE A LOT OF LAUNCH

253
00:08:24,700 --> 00:08:25,010
PANELS.

254
00:08:25,030 --> 00:08:28,320
>> THIS IS THE LAUNCH PANEL

255
00:08:28,340 --> 00:08:28,920
OPERATOR STATION. WHAT WE DO HERE IS

256
00:08:28,940 --> 00:08:32,850
WE MONITOR THE TELEMETRY, STATUS OF THE

257
00:08:32,870 --> 00:08:38,560
ROCKET, THE HEALTH OF SATELLITE. WE ALSO PROVIDE POWER

258
00:08:38,580 --> 00:08:39,430
TO THE FUNCTIONS THAT THE LAUNCH CONDUCTOR HAS US DO ON LAUNCH DAY.

259
00:08:39,450 --> 00:08:42,230
>> SO HERE WE ARE. WE'RE ON LAUNCH DAY, WHAT ARE

260
00:08:42,250 --> 00:08:43,660
YOU ACTUALLY DOING DURING THE

261
00:08:43,680 --> 00:08:44,000
LAUNCH?

262
00:08:44,020 --> 00:08:45,930
>> IT GETS BUSY AT TIMES.

263
00:08:45,950 --> 00:08:47,440

WE'LL MONITOR THE

264
00:08:47,460 --> 00:08:48,274
AIR-CONDITIONING SYSTEM TO MAKE

265
00:08:48,294 --> 00:08:53,710
SURE WE'RE PROVIDING THE RIGHT

266
00:08:53,730 --> 00:08:54,914
TEMPERATURE INTO THE FARING

267
00:08:54,934 --> 00:08:55,740
FOR THE SATELLITE AND POWERING

268
00:08:55,760 --> 00:08:57,250
UP THE ROCKET AND DOING OUR

269
00:08:57,270 --> 00:08:58,380
SYSTEMS CHECK AS WE GO THROUGH

270
00:08:58,400 --> 00:08:59,819
THE CHECKLIST AND WATCHING

271
00:08:59,839 --> 00:09:01,250
EVERYTHING THAT GOES ON.

272
00:09:01,270 --> 00:09:02,989
>> SO YOU'RE WATCHING TO SEE IF

273
00:09:03,009 --> 00:09:04,250
THE SPACECRAFT IS HEALTHY AND

274
00:09:04,270 --> 00:09:06,425
THE ROCKET IS HEALTHY.

275
00:09:06,445 --> 00:09:07,093
WHAT HAPPENS IF YOU SEE

276
00:09:07,113 --> 00:09:09,362
SOMETHING THAT's CONCERNING?

277
00:09:09,382 --> 00:09:11,190
>> IF WE SEE SOMETHING WE'LL GET

278
00:09:11,210 --> 00:09:14,330
ON THE RADIO AND TELL THE LAUNCH

279
00:09:14,350 --> 00:09:15,360
CONDUCTOR AND BRING HIS ATTENTION TO IT. HE'LL GE

280
00:09:15,380 --> 00:09:17,500
HIS ENGINEERING TEAM LOOKING AT IT AS WELL.

281
00:09:17,520 --> 00:09:18,400
>> ALL RIGHT.

282
00:09:18,420 --> 00:09:19,830
AND IF EVERYTHING GOES

283
00:09:19,850 --> 00:09:22,040
PERFECTLY, YOU GET TO PUSH THE

284
00:09:22,060 --> 00:09:23,940
BUTTON TO LET IT GO OUT?

285
00:09:23,960 --> 00:09:26,170
>> I GET TO ARM THE RELEASE

286
00:09:26,190 --> 00:09:27,410
MECHANISM BUT DON'T GET TO PUSH

287
00:09:27,430 --> 00:09:28,580
THE BIG BUTTON.

288
00:09:28,600 --> 00:09:30,750

>> WE'LL FIND OUT MORE ABOUT

289
00:09:30,770 --> 00:09:32,010
PUSHING THE BUTTON SOON. THANK YOU VERY MUCH.

290
00:09:32,030 --> 00:09:41,060
NOW WE'LL GO TO THE COCKPIT.

291
00:09:41,080 --> 00:09:41,490
HELLO DON. >> HEY KAREN. THANKS FOR STOPPING BY.

292
00:09:41,510 --> 00:09:46,590
WE ARE TALKING TO DON WALTER. HE IS A PILOT WHO

293
00:09:46,610 --> 00:09:48,430
WILL BE PILOTING THE PLANE DURING THE LAUNCH.

294
00:09:48,450 --> 00:09:49,635
HOW COOL IS THIS?

295
00:09:49,655 --> 00:09:51,200
>> THIS IS THE BEST JOB IN THE

296
00:09:51,220 --> 00:09:52,830
ENTIRE WORLD ABSOLUTELY.

297
00:09:52,850 --> 00:09:53,900
>> SO WALK US THROUGH WHAT

298
00:09:53,920 --> 00:09:55,940
YOU'RE DOING DURING THE LAUNCH.

299
00:09:55,960 --> 00:09:57,510
>> WELL, A GREAT PART OF THE

300
00:09:57,530 --> 00:09:59,740
LAUNCH TAKES PLACE ON THE GROUND

301
00:09:59,760 --> 00:10:01,010
BEFORE WE TAKE OFF.

302
00:10:01,030 --> 00:10:04,350
WE DO A LOT OF FREE FLIGHT

303
00:10:04,370 --> 00:10:04,717
PLANNING.

304
00:10:04,737 --> 00:10:07,486
I BROUGHT ACTUALLY A LITTLE BIT

305
00:10:07,506 --> 00:10:10,189
HERE FOR YOU TO SEE.

306
00:10:10,209 --> 00:10:12,091
MOST OF OUR PLANNING INVOLVES

307
00:10:12,111 --> 00:10:13,492
GETTING TO THE POINT WHERE WE'RE

308
00:10:13,512 --> 00:10:15,261
ACTUALLY GOING TO LAUNCH THE

309
00:10:15,281 --> 00:10:15,594
ROCKET.

310
00:10:15,614 --> 00:10:16,595
THE POINT WE'RE GOING TO LAUNCH

311
00:10:16,615 --> 00:10:17,763
THE ROCKET IS OVER HERE. WE

312
00:10:17,783 --> 00:10:19,632
NEED A LITTLE BIT OF SPACE TO

313
00:10:19,652 --> 00:10:22,702

CLIMB UP TO OUR LAUNCH ALTITUDE.

314
00:10:22,722 --> 00:10:24,070
JUST TO GIVE YOU A PERSPECTIVE

315
00:10:24,090 --> 00:10:25,938
WE'RE SITTING RIGHT HERE IN THE

316
00:10:25,958 --> 00:10:26,806
SKID STRIP.

317
00:10:26,826 --> 00:10:28,841
YOU CAN SEE A LITTLE BLUE

318
00:10:28,861 --> 00:10:30,609
FLASHING LIGHT HERE. THE

319
00:10:30,629 --> 00:10:32,545
DISTANCE OUT TO HERE IS ABOUT

320
00:10:32,565 --> 00:10:33,913
114 MILES.

321
00:10:33,933 --> 00:10:37,116
SO ON A CLEAR NIGHT OUR

322
00:10:37,136 --> 00:10:38,017
SPECTATORS WILL BE ABLE TO STAY

323
00:10:38,037 --> 00:10:39,919
ON THE BEACH AND ACTUALLY SEE

324
00:10:39,939 --> 00:10:41,153
THE LAUNCH.

325
00:10:41,173 --> 00:10:44,156
ALTHOUGH WE DO LAUNCH OFF AWAY

326
00:10:44,176 --> 00:10:45,891
FROM FLORIDA, BUT AGAIN THE

327
00:10:45,911 --> 00:10:47,460
MAJORITY WHAT WE DO IS PLANNING

328
00:10:47,480 --> 00:10:49,595
AND THEN ON LAUNCH DAY WE JUST

329
00:10:49,615 --> 00:10:50,997
EXECUTE THE PLAN.

330
00:10:51,017 --> 00:10:52,999
>> SO I'M SEEING THIS GIANT

331
00:10:53,019 --> 00:10:54,633
FIGURE 8 HERE. DOES THAT MEAN YOU CAN GO AROUND

332
00:10:54,653 --> 00:10:56,535
AND AROUND? HOW DO YOU DO THAT?

333
00:10:56,555 --> 00:11:00,673
>> IF YOU FOLOW MY FINGER ALONG,

334
00:11:00,693 --> 00:11:03,442
WHAT WE DO IS WE'VE GOING TO DEPART OUT OF HERE AND WE'VE GIVEN OURSELVES

335
00:11:03,462 --> 00:11:04,677
ABOUT 160 MILES BECAUSE WITH THE

336
00:11:04,697 --> 00:11:06,812
ROCKET ATTACHED TO THE OUTSIDE

337
00:11:06,832 --> 00:11:09,849
IT TAKES QUITE A WHILE TO CLIMB

338
00:11:09,869 --> 00:11:11,384

UP TO OUR LAUNCH ALTITUDE OF 39,000 FEET.

339
00:11:11,404 --> 00:11:12,752
SOMEWHERE AROUND HERE WE GET TO

340
00:11:12,772 --> 00:11:14,320
OUR LAUNCH ALTITUDE AND COME

341
00:11:14,340 --> 00:11:16,288
BACK THROUGH OUR LAUNCH POINT.

342
00:11:16,308 --> 00:11:17,990
CHECK THE WINDS, CHECK THE

343
00:11:18,010 --> 00:11:20,860
WEATHER AND CHECK THE TURBULENCE

344
00:11:20,880 --> 00:11:23,029
AND FROM THAT POINT I'D SAY IT'S

345
00:11:23,049 --> 00:11:25,398
ABOUT 30 MINUTES TO COME BACK

346
00:11:25,418 --> 00:11:26,832
AROUND THE PATTERN, BACK DOWN TO

347
00:11:26,852 --> 00:11:29,635
THE LAUNCH POINT AND ACTUALLY

348
00:11:29,655 --> 00:11:30,603
LAUNCH THE ROCKET.

349
00:11:30,623 --> 00:11:34,473
YOU SEE THERE'S SORT OF A HORSE

350
00:11:34,493 --> 00:11:36,876
RACE TRACK TYPE PATTERN HERE.

351
00:11:36,896 --> 00:11:39,512
DEPENDING ON WEATHER AND OTHER

352
00:11:39,532 --> 00:11:40,880
FACTORS, WE HAVE BASICALLY TWO

353
00:11:40,900 --> 00:11:42,815
ATTEMPTS TO LAUNCH THE ROCKET.

354
00:11:42,835 --> 00:11:44,316
GENERALLY WE TRY TO LAUNCH ON

355
00:11:44,336 --> 00:11:46,018
THE FIRST TIME BUT WE DO HAVE

356
00:11:46,038 --> 00:11:47,553
THE ABILITY WE CALL A RECYCLE TO

357
00:11:47,573 --> 00:11:50,056
COME BACK AROUND AND FLY THE

358
00:11:50,076 --> 00:11:51,624
PATTERN ONE MORE TIME AND LAUNCH

359
00:11:51,644 --> 00:11:53,459
AGAIN AND AFTERWARDS WE COME

360
00:11:53,479 --> 00:11:54,593
STRAIGHT BACK TO WHERE YOU'RE

361
00:11:54,613 --> 00:11:55,161
SITTING RIGHT NOW.

362
00:11:55,181 --> 00:11:55,761
>> ALL RIGHT.

363
00:11:55,781 --> 00:11:57,763

SO I HEARD THE BUTTON TO LAUNCH

364
00:11:57,783 --> 00:11:58,931
IS ACTUALLY UP HERE. IS THAT

365
00:11:58,951 --> 00:11:59,665
WHERE IT IS?

366
00:11:59,685 --> 00:12:03,002
>> IT'S UP HERE AND WE GET THE

367
00:12:03,022 --> 00:12:04,236
COMMAND FROM OUR LAUNCH

368
00:12:04,256 --> 00:12:05,638
COORDINATOR DOWN ON THE GROUND

369
00:12:05,658 --> 00:12:07,206
AND WHEN EVERYBODY AGREES WE'RE IN

370
00:12:07,226 --> 00:12:08,707
THE RIGHT PLACE AT THE RIGHT

371
00:12:08,727 --> 00:12:10,342
TIME AT THE RIGHT ALTITUDE WE'RE

372
00:12:10,362 --> 00:12:12,144
GIVEN THE GO AHEAD AND LAUNCH

373
00:12:12,164 --> 00:12:15,114
THE ROCKET AND THE BUTTON TO

374
00:12:15,134 --> 00:12:16,982
LAUNCH SITS RIGHT HERE. WE HAVE

375
00:12:17,002 --> 00:12:18,417
TWO PILOTS UP HERE. I'M

376
00:12:18,437 --> 00:12:20,719
FLYING THE AIRPLANE AND MY

377
00:12:20,739 --> 00:12:23,322
COPILOT STEVE, WILL ACTUALLY BE THE ONE

378
00:12:23,342 --> 00:12:25,124
WHO PUSHES THE BUTTON.

379
00:12:25,144 --> 00:12:26,325
>> WALK ME THROUGH THAT.

380
00:12:26,345 --> 00:12:29,595
PAINT ME A PICTURE.

381
00:12:29,615 --> 00:12:30,196
WHAT HAPPENS?

382
00:12:30,216 --> 00:12:33,999
>> WELL, SO A LITTLE BIT OF HIS

383
00:12:34,019 --> 00:12:36,068
BASIC PHYSICS.

384
00:12:36,088 --> 00:12:36,802
AS SOON AS STEVE PUSHES THE

385
00:12:36,822 --> 00:12:38,737
BUTTON THERE IS A HYDRAULIC

386
00:12:38,757 --> 00:12:39,538
RELEASE THAT OPENS AND ALLOWS

387
00:12:39,558 --> 00:12:41,607
THE ROCKET TO LEAVE THE

388
00:12:41,627 --> 00:12:41,974

AIRPLANE.

389
00:12:41,994 --> 00:12:44,477
THE ROCKET WEIGHS 52,000 POUNDS.

390
00:12:44,497 --> 00:12:47,746
YOU CAN IMAGINE IF YOU LOST

391
00:12:47,766 --> 00:12:50,082
52,000 POUNDS ALL AT ONCE THE

392
00:12:50,102 --> 00:12:51,016
AIRCRAFT STILL HAS THE SAME

393
00:12:51,036 --> 00:12:52,785
AMOUNT OF LIFT SO THE AIRCRAFT

394
00:12:52,805 --> 00:12:53,953
RISES BECAUSE WE DON'T HAVE THE

395
00:12:53,973 --> 00:12:56,355
WEIGHT ANYMORE AND THE ROCKET

396
00:12:56,375 --> 00:12:57,523
FALLS FOR ABOUT 5 SECONDS.

397
00:12:57,543 --> 00:12:58,891
AND IT'S THAT SEPARATION THAT

398
00:12:58,911 --> 00:13:01,494
GIVES US A PRETTY GOOD SAFETY

399
00:13:01,514 --> 00:13:03,596
MARGIN FROM THE TIME THE ROCKET

400
00:13:03,616 --> 00:13:06,165
LEAVES THE AIRPLANE UNTIL IT

401
00:13:06,185 --> 00:13:07,900
ACTUALLY LIGHTS UP AND MOTORS

402
00:13:07,920 --> 00:13:10,870
OUT A HEAD OF US.

403
00:13:10,890 --> 00:13:12,838
IT'S A FAIRLY ABRUPT DROP.

404
00:13:12,858 --> 00:13:16,208
WHEN IT RELEASES IT'S A FAIRLY

405
00:13:16,228 --> 00:13:17,676
GOOD SHAKE AND IT PUSHES US BACK

406
00:13:17,696 --> 00:13:19,478
IN OUR SEAT QUITE A BIT BECAUSE

407
00:13:19,498 --> 00:13:21,647
THE AIRPLANE IS RISING QUITE

408
00:13:21,667 --> 00:13:22,014
QUICKLY.

409
00:13:22,034 --> 00:13:24,016
THE REST OF IT IS JUST WE HAVE

410
00:13:24,036 --> 00:13:26,752
THE BEST VIEW OF ANYBODY AT NASA

411
00:13:26,772 --> 00:13:28,587
OR IN OUR COMPANY OF THE LAUNCH.

412
00:13:28,607 --> 00:13:31,557
IT'S AN ABSOLUTELY AMAZING

413
00:13:31,577 --> 00:13:33,025

SPECTACULAR VIEW AND AT NIGHT

414
00:13:33,045 --> 00:13:36,128
YOU CAN IMAGINE THE FIRE THAT

415
00:13:36,148 --> 00:13:36,929
COMES OFF THE THRUST OF THE

416
00:13:36,949 --> 00:13:40,032
ROCKET MOVING AHEAD OF US AND

417
00:13:40,052 --> 00:13:42,034
CLIMBING BASICALLY OFF INTO

418
00:13:42,054 --> 00:13:42,334
SPACE.

419
00:13:42,354 --> 00:13:44,537
WE CAN WATCH BOTH STAGES FIRST

420
00:13:44,557 --> 00:13:47,873
AND SECOND STAGE ON A CLEAR

421
00:13:47,893 --> 00:13:52,278
NIGHT WHICH IS QUITE -- IT's AN

422
00:13:52,298 --> 00:13:54,113
AMAZING EXPERIENCE AND WE'RE

423
00:13:54,133 --> 00:13:56,048
REALLY LUCKY TO BE IN A SEAT

424
00:13:56,068 --> 00:13:57,917
LIKE THIS AND CALL THIS OUR

425
00:13:57,937 --> 00:13:58,250
OFFICE.

426
00:13:58,270 --> 00:13:59,818
>> AND THEN OF COURSE AFTER IT

427
00:13:59,838 --> 00:14:01,287
LAUNCHES WE ARE GOING TO BE

428
00:14:01,307 --> 00:14:03,022
WAITING ONE MONTH FOR THAT

429
00:14:03,042 --> 00:14:05,724
INCREDIBLE RESEARCH THAT SCOTT

430
00:14:05,744 --> 00:14:09,361
ENGLAND TOLD US ABOUT TO

431
00:14:09,381 --> 00:14:10,763
UNDERSTAND HOW TERRESTRIAL

432
00:14:10,783 --> 00:14:12,398
WEATHER AND SPACE WEATHER

433
00:14:12,418 --> 00:14:12,765
INTERACT.

434
00:14:12,785 --> 00:14:17,036
GO TO NASA.GOV/ICON AND STAY

435
00:14:17,056 --> 00:14:18,370
TUNED FOR GREAT THINGS FROM THIS

436
00:14:18,390 --> 00:14:19,638
GREAT MISSION AND GREAT LAUNCH.

437
00:14:19,658 --> 00:14:20,172
THANK YOU SO MUCH.

438
00:14:20,192 --> 00:14:32,685

BYE!