



1
00:00:04,329 --> 00:00:02,450
the controllers in Africa that I had

2
00:00:06,499 --> 00:00:04,339
were trace rescued by the nigerian army

3
00:00:08,750 --> 00:00:06,509
Zanzibar we'd work under the protection

4
00:00:10,129 --> 00:00:08,760
of the Queen's royal rifles or the

5
00:00:11,839 --> 00:00:10,139
gordon highlanders who would surround

6
00:00:13,430 --> 00:00:11,849
the tracking station during contact

7
00:00:15,410 --> 00:00:13,440
periods bring the controllers back to

8
00:00:17,510 --> 00:00:15,420
the quarters station to gunner at the

9
00:00:19,670 --> 00:00:17,520
top of the stairs became so violent at

10
00:00:22,730 --> 00:00:19,680
that site that we shut it down after

11
00:00:24,470 --> 00:00:22,740
only three years but these young folks

12
00:00:27,230 --> 00:00:24,480
at the sites where I as our ears and

13
00:00:28,429 --> 00:00:27,240

voice as the spacecraft passed overhead

14

00:00:30,800 --> 00:00:28,439

and for their age they were given

15

00:00:32,959 --> 00:00:30,810

incredible responsibilities and many of

16

00:00:36,530 --> 00:00:32,969

them grew to be the leaders of project

17

00:00:37,819 --> 00:00:36,540

Apollo he first ventured into space in

18

00:00:39,350 --> 00:00:37,829

Project Mercury and each one of our

19

00:00:41,389 --> 00:00:39,360

launches was a chapter in the history

20

00:00:43,790 --> 00:00:41,399

book a space flight our mistakes were

21

00:00:45,440 --> 00:00:43,800

violent they're brutal there are visible

22

00:00:46,910 --> 00:00:45,450

two of our first three Atlas rockets

23

00:00:48,920 --> 00:00:46,920

blew up shortly after they left the

24

00:00:50,840 --> 00:00:48,930

launchpad then we launched our first

25

00:00:52,520 --> 00:00:50,850

redstone rocket we sent the firing

26

00:00:54,200 --> 00:00:52,530

command the engine ignited lifted

27

00:00:56,779 --> 00:00:54,210

florence's off the launch pad then the

28

00:00:58,189 --> 00:00:56,789

engine shut down to some miracle

29

00:00:59,840 --> 00:00:58,199

remained upright in the launch day of

30

00:01:01,939 --> 00:00:59,850

the escape tower fire going up to about

31

00:01:03,560 --> 00:01:01,949

4,000 feet and then came plummeting down

32

00:01:06,560 --> 00:01:03,570

to viewing stand senators and

33

00:01:09,289 --> 00:01:06,570

congressmen ran for cover our rocket

34

00:01:10,940 --> 00:01:09,299

engineers were speaking in German we

35

00:01:14,420 --> 00:01:10,950

didn't understand what they're saying we

36

00:01:16,399 --> 00:01:14,430

literally did not know what to do but we

37

00:01:17,929 --> 00:01:16,409

were fortunate those days because our

38

00:01:20,179 --> 00:01:17,939

nation understood there is no

39

00:01:21,859 --> 00:01:20,189

achievement without risk and there

40

00:01:24,850 --> 00:01:21,869

certainly weren't any guarantees in this

41

00:01:27,350 --> 00:01:24,860

new business that we called space light

42

00:01:28,700 --> 00:01:27,360

but six Americans and space and our

43

00:01:30,530 --> 00:01:28,710

first two years and there were close

44

00:01:32,929 --> 00:01:30,540

calls and every one of those missions

45

00:01:35,990 --> 00:01:32,939

especially in John Glenn's and Scotty

46

00:01:39,020 --> 00:01:36,000

carpenters but we got every one of our

47

00:01:41,120 --> 00:01:39,030

crewmen back and by the time that we had

48

00:01:42,980 --> 00:01:41,130

finished with Project Mercury we had

49

00:01:45,499 --> 00:01:42,990

learned that man could live in could

50

00:01:47,859 --> 00:01:45,509

perform in space but we learned much

51
00:01:50,600 --> 00:01:47,869
more we learned of leaders in leadership

52
00:01:52,249 --> 00:01:50,610
leaders must have integrity their

53
00:01:54,260 --> 00:01:52,259
teachers their team builders they're

54
00:01:57,709 --> 00:01:54,270
great listeners and when there's trouble

55
00:01:59,539 --> 00:01:57,719
they're out front we also learned a lot

56
00:02:01,490 --> 00:01:59,549
about ourselves because many of us came

57
00:02:03,859 --> 00:02:01,500
in from aircraft flight testing our egos

58
00:02:05,800 --> 00:02:03,869
were bigger than this room it was tough

59
00:02:08,690 --> 00:02:05,810
at times to get people to work together

60
00:02:10,430 --> 00:02:08,700
but we knew that success would only come

61
00:02:11,750 --> 00:02:10,440
as a team so we became one and we

62
00:02:15,800 --> 00:02:11,760
learned to check our ego at the door

63
00:02:17,660 --> 00:02:15,810

every day when we came to work so he

64
00:02:19,640 --> 00:02:17,670
moved into the Gemini program and joomla

65
00:02:22,640 --> 00:02:19,650
was designed to develop and test and

66
00:02:25,070 --> 00:02:22,650
prove the technologies that we needed in

67
00:02:27,350 --> 00:02:25,080
order to go to the moon one of these

68
00:02:29,330 --> 00:02:27,360
technologies related to the tools and

69
00:02:32,180 --> 00:02:29,340
the techniques we used in designing our

70
00:02:34,070 --> 00:02:32,190
mission trajectories during Project

71
00:02:35,690 --> 00:02:34,080
Mercury for trajectory design we had a

72
00:02:37,400 --> 00:02:35,700
very large group of women about a

73
00:02:39,949 --> 00:02:37,410
hundred of them they were all

74
00:02:42,500 --> 00:02:39,959
mathematicians and we called these women

75
00:02:45,830 --> 00:02:42,510
computers computers were people to us in

76
00:02:47,630 --> 00:02:45,840
the early days not machines and we armed

77
00:02:49,280 --> 00:02:47,640
these women with computers and they

78
00:02:51,140 --> 00:02:49,290
traveled with us from a headquarters at

79
00:02:53,360 --> 00:02:51,150
Langley field and Virginia down to the

80
00:02:55,580 --> 00:02:53,370
Cape for the launches they get down

81
00:02:57,290 --> 00:02:55,590
there they punch away a keyboard and the

82
00:02:58,790 --> 00:02:57,300
machines they write the answers down

83
00:03:00,619 --> 00:02:58,800
they would plot it in graph paper and

84
00:03:03,589 --> 00:03:00,629
these women would do this endlessly day

85
00:03:07,040 --> 00:03:03,599
after day just to design a single

86
00:03:08,839 --> 00:03:07,050
mercury trajectory this approach wasn't

87
00:03:10,430 --> 00:03:08,849
going to get us to the moon it wouldn't

88
00:03:12,170 --> 00:03:10,440

even get to space class around the mood

89

00:03:14,869 --> 00:03:12,180

and Gemini so he finally did it

90

00:03:17,690 --> 00:03:14,879

computers and each one of these machines

91

00:03:19,490 --> 00:03:17,700

was a big as a house five of them filled

92

00:03:21,860 --> 00:03:19,500

the entire first floor no new Mission

93

00:03:24,170 --> 00:03:21,870

Control Center in Houston they even put

94

00:03:27,199 --> 00:03:24,180

a small 4,000 word computer on board the

95

00:03:30,740 --> 00:03:27,209

Gemini spacecraft but the problem was we

96

00:03:32,270 --> 00:03:30,750

had no computer experience so he went to

97

00:03:33,680 --> 00:03:32,280

the college's the universities

98

00:03:34,970 --> 00:03:33,690

throughout our nation brought in the

99

00:03:37,460 --> 00:03:34,980

young people who are working with

100

00:03:39,080 --> 00:03:37,470

computers and laboratories we went to

101
00:03:40,820 --> 00:03:39,090
the army missile command at Fort Bliss

102
00:03:42,229 --> 00:03:40,830
and Texas and broaden the Corporal

103
00:03:43,759 --> 00:03:42,239
corporals and sergeants of their

104
00:03:45,410 --> 00:03:43,769
discharge because the army had been

105
00:03:47,990 --> 00:03:45,420
working with computers in the ground air

106
00:03:49,729 --> 00:03:48,000
missile program and we took these new

107
00:03:52,280 --> 00:03:49,739
recruits and merged him with the mercury

108
00:03:53,330 --> 00:03:52,290
veterans and we started working in the

109
00:03:57,410 --> 00:03:53,340
very edge of all knowledge all

110
00:03:59,539 --> 00:03:57,420
technology and all experience now he

111
00:04:01,070 --> 00:03:59,549
first started off in space Soviet Union

112
00:04:04,070 --> 00:04:01,080
had about a two-and-a-half-year lead on

113
00:04:06,350 --> 00:04:04,080

us but what had white stepped outside of

114

00:04:08,660 --> 00:04:06,360

a spacecraft and the Gemini 4 mission we

115

00:04:11,839 --> 00:04:08,670

had now narrowed that lead down to mere

116

00:04:14,570 --> 00:04:11,849

months and then on the next two missions

117

00:04:17,420 --> 00:04:14,580

for the first time we set american

118

00:04:18,890 --> 00:04:17,430

manned space flight records first for

119

00:04:21,229 --> 00:04:18,900

mission duration and then we were on

120

00:04:22,670 --> 00:04:21,239

dilute two spacecrafts when we had

121

00:04:24,530 --> 00:04:22,680

accomplished that round of a we had

122

00:04:26,150 --> 00:04:24,540

developed the technologies we needed to

123

00:04:28,010 --> 00:04:26,160

reach further into space

124

00:04:30,800 --> 00:04:28,020

and we had the confidence to use these

125

00:04:33,890 --> 00:04:30,810

new technologies but we continued to

126

00:04:36,380 --> 00:04:33,900

learn of ourselves and of our work we

127

00:04:38,360 --> 00:04:36,390

learned of discipline of focus so

128

00:04:39,650 --> 00:04:38,370

intense upon the objective that we would

129

00:04:41,180 --> 00:04:39,660

never do it I think personally that

130

00:04:43,610 --> 00:04:41,190

would compromise achieving that

131

00:04:45,380 --> 00:04:43,620

objective we also found the value of

132

00:04:47,300 --> 00:04:45,390

high morale because we now knew were

133

00:04:51,230 --> 00:04:47,310

succeeding because our beliefs and our

134

00:04:54,530 --> 00:04:51,240

mission our team and in ourselves so I

135

00:04:58,670 --> 00:04:54,540

moved into Apollo we're in the consul's

136

00:05:00,320 --> 00:04:58,680

Friday afternoon january 27th 1967 one

137

00:05:03,230 --> 00:05:00,330

month from launch testing the Apollo

138

00:05:04,670 --> 00:05:03,240

command and service module crew members

139

00:05:07,610 --> 00:05:04,680

were Gus Grissom and white and Roger

140

00:05:09,070 --> 00:05:07,620

Chaffee we had worked with gussa dead

141

00:05:12,140 --> 00:05:09,080

and the mercury in the Gemini program

142

00:05:13,730 --> 00:05:12,150

and Roger was a navy rookie preparing

143

00:05:15,230 --> 00:05:13,740

for as a first spaceflight but he was

144

00:05:17,150 --> 00:05:15,240

already pretty well known within the

145

00:05:18,890 --> 00:05:17,160

ranks because he is one of the pilots

146

00:05:21,680 --> 00:05:18,900

who took the pictures over Cuba during

147

00:05:23,600 --> 00:05:21,690

the missile crisis that's that Friday

148

00:05:25,370 --> 00:05:23,610

had been gone very well we had problems

149

00:05:27,950 --> 00:05:25,380

with communications with problem with

150

00:05:30,710 --> 00:05:27,960

life support crew reported noxious odor

151
00:05:33,440 --> 00:05:30,720
inside the spacecraft test procedures

152
00:05:35,660 --> 00:05:33,450
just didn't fit we struggled through

153
00:05:37,790 --> 00:05:35,670
that afternoon frequently calling a halt

154
00:05:41,600 --> 00:05:37,800
mcountdown sorted out write out the new

155
00:05:44,090 --> 00:05:41,610
sequence continue on to at 627 that

156
00:05:45,590 --> 00:05:44,100
evening we had to call another halt

157
00:05:48,230 --> 00:05:45,600
before we transferred from external

158
00:05:50,960 --> 00:05:48,240
power in the launchpad until internal

159
00:05:53,990 --> 00:05:50,970
power in the spacecraft and four minutes

160
00:05:56,030 --> 00:05:54,000
after entering that countdown hold we're

161
00:05:57,920 --> 00:05:56,040
startled by screams coming from our crew

162
00:06:00,920 --> 00:05:57,930
and we listen to our crews screams as

163
00:06:04,970 --> 00:06:00,930

they died and with their death came

164

00:06:08,030 --> 00:06:04,980

anger anger at ourselves because we knew

165

00:06:11,690 --> 00:06:08,040

we were responsible for America's first

166

00:06:13,520 --> 00:06:11,700

space disaster we wrote two more words

167

00:06:16,430 --> 00:06:13,530

into our vocabulary as mission

168

00:06:18,350 --> 00:06:16,440

controllers tough and competent tough

169

00:06:20,240 --> 00:06:18,360

meaning we will never get shook for my

170

00:06:23,000 --> 00:06:20,250

responsibilities because we are forever

171

00:06:24,770 --> 00:06:23,010

accountable for what we do or in the

172

00:06:27,470 --> 00:06:24,780

case of Apollo on and our crew what we

173

00:06:29,930 --> 00:06:27,480

fail to do competent will never again

174

00:06:31,880 --> 00:06:29,940

take anything for granted will never

175

00:06:34,820 --> 00:06:31,890

stop learning from now on the teams and

176

00:06:36,290 --> 00:06:34,830

Mission Control will be perfect we

177

00:06:38,029 --> 00:06:36,300

designed the badge the emblem of the

178

00:06:39,679 --> 00:06:38,039

Mission Control team and the price for

179

00:06:42,499 --> 00:06:39,689

admission to our ranks ins where this

180

00:06:45,019 --> 00:06:42,509

lapel pin discipline morale toughness

181

00:06:48,949 --> 00:06:45,029

competence commitment team work as a

182

00:06:50,239 --> 00:06:48,959

team we may never fail on our line of

183

00:06:52,429 --> 00:06:50,249

business the boss is the flight director

184

00:06:55,489 --> 00:06:52,439

he has a very simple job description it

185

00:06:57,439 --> 00:06:55,499

is only one sentence long it says the

186

00:07:00,259 --> 00:06:57,449

flight director it may take any actions

187

00:07:03,169 --> 00:07:00,269

necessary for crew safety and mission

188

00:07:05,469 --> 00:07:03,179

success during the course of the mission

189

00:07:08,029 --> 00:07:05,479

there is no higher authority and the

190

00:07:11,269 --> 00:07:08,039

flight director supported by a team of

191

00:07:12,829 --> 00:07:11,279

between 15 and 21 controllers people

192

00:07:14,899 --> 00:07:12,839

specialize in trajectories and

193

00:07:16,459 --> 00:07:14,909

spacecraft systems we have facility

194

00:07:18,829 --> 00:07:16,469

operators we have planners they have

195

00:07:20,869 --> 00:07:18,839

procedures writers who have a medical

196

00:07:23,299 --> 00:07:20,879

doctor who looks after the team on the

197

00:07:24,469 --> 00:07:23,309

ground as well as the crew in space we

198

00:07:26,299 --> 00:07:24,479

have an astronaut provides

199

00:07:28,699 --> 00:07:26,309

communications during the course of the

200

00:07:30,049 --> 00:07:28,709

mission mission controllers a young

201
00:07:32,809 --> 00:07:30,059
they're generally in the early to the

202
00:07:36,259 --> 00:07:32,819
mid 20s flight directors in their early

203
00:07:39,169 --> 00:07:36,269
to mid thirties and in July twentieth

204
00:07:42,679 --> 00:07:39,179
nineteen sixty-nine a team of young

205
00:07:46,669 --> 00:07:42,689
Americans average age 26 took Neil

206
00:07:48,829 --> 00:07:46,679
Armstrong Buzz Aldrin and and the crew

207
00:07:51,619 --> 00:07:48,839
at the world to the surface of the Moon

208
00:07:53,749 --> 00:07:51,629
and we literally fought every step of

209
00:07:55,519 --> 00:07:53,759
the way to get there when we finally

210
00:07:58,040 --> 00:07:55,529
shut the engine down the lunar surface

211
00:07:59,959 --> 00:07:58,050
that day we had less than 17 seconds of

212
00:08:02,419 --> 00:07:59,969
fuel remaining and we're in the process

213
00:08:06,379 --> 00:08:02,429

of counting down to a very difficult and

214

00:08:08,569 --> 00:08:06,389

very risky land abort decision but when

215

00:08:10,429 --> 00:08:08,579

they shot that engine down and when the

216

00:08:12,199 --> 00:08:10,439

crew walked on the surface and then they

217

00:08:15,259 --> 00:08:12,209

lifted off and we got those guys back

218

00:08:17,209 --> 00:08:15,269

home we had fulfilled the pledge that we

219

00:08:21,169 --> 00:08:17,219

had made to are now dead president john

220

00:08:23,569 --> 00:08:21,179

f kennedy in the crew of apollo 1 we

221

00:08:25,189 --> 00:08:23,579

launched again in november apollo 12 as

222

00:08:27,829 --> 00:08:25,199

we left the launchpad we hit twice by

223

00:08:29,899 --> 00:08:27,839

lightning we had three crewmen inside a

224

00:08:31,249 --> 00:08:29,909

dead spacecraft thundering up towards

225

00:08:32,949 --> 00:08:31,259

orbit the other thing working was

226

00:08:35,389 --> 00:08:32,959

booster propulsion booster guidance

227

00:08:37,279 --> 00:08:35,399

Mission Control had two minutes to save

228

00:08:39,589 --> 00:08:37,289

that mission if the reacted bells to the

229

00:08:42,199 --> 00:08:39,599

fuel cells had closed we voice

230

00:08:45,379 --> 00:08:42,209

instructions up to the crew to throw a

231

00:08:47,240 --> 00:08:45,389

very obscure switch SCE docs who didn't

232

00:08:49,220 --> 00:08:47,250

understand what we wanted repeated over

233

00:08:50,829 --> 00:08:49,230

and over and over and finally all being

234

00:08:53,300 --> 00:08:50,839

caught on through the proper switch

235

00:08:55,760 --> 00:08:53,310

telemetry came back online

236

00:08:57,620 --> 00:08:55,770

team could get to work the verified

237

00:08:59,420 --> 00:08:57,630

reactants were flown in the fuel cells

238

00:09:00,800 --> 00:08:59,430

we brought the fuel cells back online in

239

00:09:03,350 --> 00:09:00,810

the power system we secured the

240

00:09:06,110 --> 00:09:03,360

navigation system everything kept

241

00:09:08,510 --> 00:09:06,120

working got the corrupt in orbit did he

242

00:09:09,829 --> 00:09:08,520

laid injection to the moon by one Rev

243

00:09:11,800 --> 00:09:09,839

that day so we could check the

244

00:09:14,900 --> 00:09:11,810

spacecraft out as thoroughly as possible