



1
00:00:00,700 --> 00:00:07,974
[Airplane Sound]

2
00:00:07,974 --> 00:00:13,413
[Sonic Boom]

3
00:00:13,413 --> 00:00:22,455
[Music]

4
00:00:38,938 --> 00:00:40,673
>> I was born in
Bozeman, Montana.

5
00:00:40,673 --> 00:00:44,877
I don't have the stories that
everybody has about the whole,

6
00:00:44,877 --> 00:00:47,947
you know, wanting to be
an astronaut or wanting

7
00:00:47,947 --> 00:00:50,917
to be involved in
science and everything.

8
00:00:50,917 --> 00:00:52,985
I was not good with
math and science.

9
00:00:52,985 --> 00:00:57,623
My mother's father
was a photographer

10
00:00:57,623 --> 00:00:59,292
and when I was seven years old,

11
00:00:59,292 --> 00:01:01,527
he gave me a Kodak
Brownie camera.

12

00:01:01,527 --> 00:01:04,197

It's one of the little ones that
you just hold and look down,

13

00:01:04,197 --> 00:01:05,731

click, click, take pictures.

14

00:01:05,731 --> 00:01:09,001

One of the things that I did
photograph when I was growing

15

00:01:09,001 --> 00:01:11,104

up was sports because
I like the action

16

00:01:11,104 --> 00:01:13,039

and trying to stop the action.

17

00:01:13,039 --> 00:01:17,844

A lot of what we do here
is very similar to that.

18

00:01:17,844 --> 00:01:20,680

It's trying to stop the action,
whether it's the airplanes,

19

00:01:20,680 --> 00:01:22,615

or the tests they're
doing, or things like that.

20

00:01:22,615 --> 00:01:25,384

My name is Jim Ross and
I'm the photo lead here

21

00:01:25,384 --> 00:01:29,388

at Armstrong Flight
Research Center.

22

00:01:29,388 --> 00:01:33,025
[Music]

23

00:01:33,025 --> 00:01:36,395
To be a photographer in Montana,
there's not a lot of options

24

00:01:36,395 --> 00:01:38,431
because it's such a
small, rural area.

25

00:01:38,431 --> 00:01:40,066
I really don't miss
the snow up there.

26

00:01:40,066 --> 00:01:42,034
That was one of the
reasons I told my parents

27

00:01:42,034 --> 00:01:44,403
when I left I was
going to find an area

28

00:01:44,403 --> 00:01:46,739
that was the hottest
I could possibly find,

29

00:01:46,739 --> 00:01:51,043
which is probably pretty close
to what I found down here.

30

00:01:51,043 --> 00:01:54,747
Long story short, I was
hired as junior photographer

31

00:01:54,747 --> 00:01:57,683
at NASA Dryden Flight Research
Center, which was the predecessor

32

00:01:57,683 --> 00:01:59,385

to Armstrong Flight
Research Center.

33

00:01:59,385 --> 00:02:06,058

[Music]

34

00:02:06,058 --> 00:02:07,393

The photography that we do here

35

00:02:07,393 --> 00:02:11,164

at NASA Armstrong is a wide
range of different things.

36

00:02:11,164 --> 00:02:15,935

We cover anywhere from public
outreach, to educational events,

37

00:02:15,935 --> 00:02:20,873

to personnel situations
on up into adjustment

38

00:02:20,873 --> 00:02:25,645

of instrumentation in aircraft,
or the aircraft themselves,

39

00:02:25,645 --> 00:02:27,780

documented for the
project to use

40

00:02:27,780 --> 00:02:30,082

for various different
situations.

41

00:02:30,082 --> 00:02:31,884

Anytime they modify an aircraft,

42

00:02:31,884 --> 00:02:35,488

we are usually called before
the modification, we'll go in

43

00:02:35,488 --> 00:02:36,789
and shoot the aircraft.

44

00:02:36,789 --> 00:02:40,026
We'll go shoot the configuration
of what it currently is

45

00:02:40,026 --> 00:02:43,896
and then they will make
changes; put the instruments in

46

00:02:43,896 --> 00:02:46,165
or put the switches in,
or whatever they need

47

00:02:46,165 --> 00:02:47,667
to make the adjustments.

48

00:02:47,667 --> 00:02:49,735
And then we'll go in
and shoot the after.

49

00:02:49,735 --> 00:02:53,506
And they keep all that as
data for them to be able

50

00:02:53,506 --> 00:02:56,108
to know what different
configurations they've had.

51

00:02:56,108 --> 00:02:59,579
And if they have to tuck things
way back far in a bay,

52

00:02:59,579 --> 00:03:01,714
they know what's in there
so that they don't have

53

00:03:01,714 --> 00:03:03,382

to open everything
up and take things

54

00:03:03,382 --> 00:03:05,885
out to see what's in there.

55

00:03:05,885 --> 00:03:07,286
On the ground, often times,

56

00:03:07,286 --> 00:03:12,191
we'll shoot the fixture before
it flies and then do, like,

57

00:03:12,191 --> 00:03:15,194
a 360, shots all the way around.

58

00:03:15,194 --> 00:03:18,598
Then when they go fly at
Mach 2, they come back

59

00:03:18,598 --> 00:03:20,967
and then we shoot it again
and they compare the before

60

00:03:20,967 --> 00:03:23,336
and after to make sure that
they didn't do something

61

00:03:23,336 --> 00:03:26,672
to the fixture while they were
flying at the high speeds.

62

00:03:26,672 --> 00:03:29,909
We'll do takeoffs,
landings, aerials --

63

00:03:29,909 --> 00:03:31,143
[Background Noise]

64

00:03:31,143 --> 00:03:35,381

We also go on deployments where we will do science missions

65

00:03:35,381 --> 00:03:37,817

and document inside while they're doing their

66

00:03:37,817 --> 00:03:38,885

science work.

67

00:03:38,885 --> 00:03:41,020

Here, when we shoot, especially in the aircraft,

68

00:03:41,020 --> 00:03:44,257

we do a lot of data collection for the project.

69

00:03:44,257 --> 00:03:50,096

They will often times, like, put tufts or put some kind of grease

70

00:03:50,096 --> 00:03:53,266

or something on the aircraft and then they'll look at the flow

71

00:03:53,266 --> 00:03:55,434

of the air on the aircraft.

72

00:03:55,434 --> 00:03:57,169

So we'll end up shooting pictures

73

00:03:57,169 --> 00:03:59,839

of the different configurations that they'll have

74

00:03:59,839 --> 00:04:03,242

on the aircraft and those

pictures will be used

75

00:04:03,242 --> 00:04:04,810
by the engineers.

76

00:04:04,810 --> 00:04:07,813
Anything that pretty much
happens here photographically

77

00:04:07,813 --> 00:04:10,916
at Armstrong, we cover in
one way, shape, or form.

78

00:04:12,418 --> 00:04:15,187
When I first started out,
we did everything by hand.

79

00:04:15,187 --> 00:04:18,391
We would take the
pictures, process the film,

80

00:04:18,391 --> 00:04:19,759
make the proof sheets.

81

00:04:19,759 --> 00:04:22,795
So we eventually transitioned
to the digital world,

82

00:04:22,795 --> 00:04:26,132
which in a lot of cases
made things easier.

83

00:04:26,132 --> 00:04:28,234
I remember when I first
started and being nervous

84

00:04:28,234 --> 00:04:30,303
about whether I got
the image or not,

85

00:04:30,303 --> 00:04:34,407

so I would take my pictures, run
back here, process it real quick

86

00:04:34,407 --> 00:04:36,876

and look at it to make sure
I got what I was supposed to.

87

00:04:36,876 --> 00:04:39,845

Nowadays with digital you
just look at the image

88

00:04:39,845 --> 00:04:41,914

through the back of
the camera and it shows

89

00:04:41,914 --> 00:04:44,850

that you got the
image or you didn't,

90

00:04:44,850 --> 00:04:48,087

or you can make adjustments
right real-time.

91

00:04:48,087 --> 00:04:49,255

If you did something wrong,

92

00:04:49,255 --> 00:04:51,123

you can adjust your
lighting and get it better.

93

00:04:51,123 --> 00:04:56,329

With film, you just had to shoot
several different shots and hope

94

00:04:56,329 --> 00:05:00,032

that one of those was getting
you what you were wanting

95

00:05:00,032 --> 00:05:02,735
out of the situation.

96
00:05:02,735 --> 00:05:06,172
Within two years being on the
job, I was asked if I wanted

97
00:05:06,172 --> 00:05:09,308
to fly and I was very
hesitant about it

98
00:05:09,308 --> 00:05:12,678
because I do get pretty
strong motion sickness.

99
00:05:12,678 --> 00:05:14,347
But I said I would go
ahead and give it a try.

100
00:05:14,347 --> 00:05:20,720
And I flew in a T-38 and
flew for about an hour

101
00:05:20,720 --> 00:05:22,288
and got sick about four times.

102
00:05:22,288 --> 00:05:24,690
So I decided that
I was not going

103
00:05:24,690 --> 00:05:26,492
to be an aerial photographer
and said

104
00:05:26,492 --> 00:05:27,860
thanks but no thanks.

105
00:05:27,860 --> 00:05:29,829
It just wasn't going to work.

106

00:05:29,829 --> 00:05:33,466

And the pilots and some of the engineers, Marta Bohn-Meyer

107

00:05:33,466 --> 00:05:35,601

in particular, she called me to her office.

108

00:05:35,601 --> 00:05:37,536

And I went up to her office and she talked to me

109

00:05:37,536 --> 00:05:39,805

about the whole flying and said

110

00:05:39,805 --> 00:05:41,340

that she heard that I had a flight.

111

00:05:41,340 --> 00:05:42,174

And I said, "Yeah."

112

00:05:42,174 --> 00:05:43,209

And she goes, "Tell me about it."

113

00:05:43,209 --> 00:05:44,477

And I said, "Well, it didn't go well."

114

00:05:44,477 --> 00:05:46,645

And she says, "Well, what does it mean, it didn't go well?"

115

00:05:46,645 --> 00:05:47,713

And I said, "I got sick a lot."

116

00:05:47,713 --> 00:05:49,048

And she said, "Well,

what's a lot?"

117

00:05:49,048 --> 00:05:51,083

And I said, "I got
sick four times."

118

00:05:51,083 --> 00:05:54,220

And I could tell that she wanted
to react to that, but she kind

119

00:05:54,220 --> 00:05:57,256

of held it together and was
kind of thinking about it.

120

00:05:57,256 --> 00:06:00,192

And she had her engineering
hat on that she always had on.

121

00:06:00,192 --> 00:06:02,995

And, so, she was thinking about,
"Well, how long does it take

122

00:06:02,995 --> 00:06:05,364

for you to recover every
time you get sick?"

123

00:06:05,364 --> 00:06:07,233

And I said, "Well, it takes,
like, a minute or so."

124

00:06:07,233 --> 00:06:09,201

And she goes, "Well, our
average test flight is, like,

125

00:06:09,201 --> 00:06:11,937

60 minutes, so that's, 56
minutes you can take pictures.

126

00:06:11,937 --> 00:06:13,038

So I don't see a problem there.

127

00:06:13,038 --> 00:06:14,139

We're good to go."

128

00:06:14,139 --> 00:06:16,509

And about two months later,
I tried another flight

129

00:06:16,509 --> 00:06:20,946

and it went better, as they said
it would, but I still got sick.

130

00:06:20,946 --> 00:06:26,419

And eventually, as time went
on, I went ahead and decided

131

00:06:26,419 --> 00:06:28,320

that I would commit to flying.

132

00:06:28,320 --> 00:06:30,356

And I've got about 800 hours

133

00:06:30,356 --> 00:06:34,393

in about 12 different
types of aircraft now.

134

00:06:34,393 --> 00:06:43,469

[Airplane Sound]

135

00:06:47,039 --> 00:06:48,874

When flying in high
performance aircraft,

136

00:06:48,874 --> 00:06:51,577

it's your own little world
once you get in there.

137

00:06:51,577 --> 00:06:55,815

You learn through the years of

how to deal with taking pictures

138

00:06:55,815 --> 00:06:57,550

with the helmet on,
with the mask on,

139

00:06:57,550 --> 00:06:59,919

with all the different
gear, the gloves.

140

00:06:59,919 --> 00:07:02,254

It's not that easy at first.

141

00:07:02,254 --> 00:07:03,489

You have to try to frame

142

00:07:03,489 --> 00:07:06,358

up without having the camera
all the way to your face

143

00:07:06,358 --> 00:07:08,027

because of the helmet
and the mask.

144

00:07:08,027 --> 00:07:11,297

As time went on, you start
to anticipate what's going

145

00:07:11,297 --> 00:07:14,133

to happen with the maneuvers
the pilots are doing.

146

00:07:14,133 --> 00:07:16,101

I would miss some of the
stuff in the beginning,

147

00:07:16,101 --> 00:07:17,803

not knowing that they were going

148

00:07:17,803 --> 00:07:19,371
to do this maneuver
or that maneuver.

149
00:07:19,371 --> 00:07:23,042
But now after doing it for
24 years, you can figure

150
00:07:23,042 --> 00:07:25,544
out that they're about to do an
over-the-top, or they're going

151
00:07:25,544 --> 00:07:28,614
to do a hard right, or a hard
left and get the camera ready,

152
00:07:28,614 --> 00:07:30,015
or get the body position ready.

153
00:07:30,015 --> 00:07:35,521
We can do up to, like, normally
6 Gs when we do the flying

154
00:07:35,521 --> 00:07:37,490
and that makes the
camera weigh, you know,

155
00:07:37,490 --> 00:07:39,592
roughly about 60 pounds.

156
00:07:39,592 --> 00:07:43,162
So that's another thing that we
have to get ready for if we know

157
00:07:43,162 --> 00:07:46,131
that we're going to do a high
G maneuver, we have to figure

158
00:07:46,131 --> 00:07:47,199
out how to brace the camera.

159

00:07:47,199 --> 00:07:49,768

And if you're not set
up on the body position,

160

00:07:49,768 --> 00:07:52,137

sometimes you can get
yourself in a bad position

161

00:07:52,137 --> 00:07:53,272

where you get yourself hurt.

162

00:07:53,272 --> 00:07:55,140

So it's a lot of anticipation.

163

00:07:55,140 --> 00:07:59,411

We're not allowed to have any
kind of pods or restraints

164

00:07:59,411 --> 00:08:02,248

or anything in the aircraft
because if we have to eject,

165

00:08:02,248 --> 00:08:05,651

they want us to make sure
that we don't keep ourselves

166

00:08:05,651 --> 00:08:07,486

from being able to get
out of the airplane.

167

00:08:07,486 --> 00:08:10,022

So all you can do is
handheld photography

168

00:08:10,022 --> 00:08:11,757

and sometimes that's
a challenge.

169

00:08:11,757 --> 00:08:14,760

There are a lot of different things that can cause problems

170

00:08:14,760 --> 00:08:16,128

in the aircraft when we're flying.

171

00:08:16,128 --> 00:08:18,631

People think that it's just, take the camera,

172

00:08:18,631 --> 00:08:20,399

point it out the window, and take pictures.

173

00:08:20,399 --> 00:08:21,400

But a lot of the things --

174

00:08:21,400 --> 00:08:23,736

the different canopies cause problems.

175

00:08:23,736 --> 00:08:26,972

An F-18 is a lot more user friendly than the F-15.

176

00:08:26,972 --> 00:08:28,974

We get a lot more canopy reflections

177

00:08:28,974 --> 00:08:30,910

from the inside of the aircraft.

178

00:08:30,910 --> 00:08:34,013

So we have to work around those reflections.

179

00:08:34,013 --> 00:08:36,882

We also have to deal

with different speeds.

180

00:08:36,882 --> 00:08:38,284

If we're doing something
high speed,

181

00:08:38,284 --> 00:08:40,586

like when we were doing
the ejection seat testing,

182

00:08:40,586 --> 00:08:43,956

we were taking pictures of
them shooting a mannequin

183

00:08:43,956 --> 00:08:46,992

out of an F-4 and the
issues that we had

184

00:08:46,992 --> 00:08:50,296

with that was it all happened
within about two seconds,

185

00:08:50,296 --> 00:08:54,967

but we were shooting the camera
at roughly nine frames a second,

186

00:08:54,967 --> 00:08:58,304

so we had about four seconds
worth to take pictures with.

187

00:08:58,304 --> 00:08:59,972

You would miss the event
if you were too late.

188

00:08:59,972 --> 00:09:02,207

If you went too early,
you would run

189

00:09:02,207 --> 00:09:03,976

out of film before

you had a chance

190

00:09:03,976 --> 00:09:06,712
to even take your pictures,
so that was a problem.

191

00:09:06,712 --> 00:09:08,747
So those are things
that we always have

192

00:09:08,747 --> 00:09:10,182
to take into account.

193

00:09:10,182 --> 00:09:12,885
We also have issues
shooting through the canopy.

194

00:09:12,885 --> 00:09:14,954
We found that we can't
shoot with much more

195

00:09:14,954 --> 00:09:18,624
than 120-millimeter lens or
we start getting some kind

196

00:09:18,624 --> 00:09:20,225
of a crystallization effect

197

00:09:20,225 --> 00:09:22,995
or a halo effect
around the airplanes.

198

00:09:22,995 --> 00:09:28,400
So that limits on how much
we can shoot with the lens.

199

00:09:28,400 --> 00:09:29,902
A lot of people ask questions

200

00:09:29,902 --> 00:09:33,539
about whether we
Photoshop the images or not.

201
00:09:33,539 --> 00:09:36,575
Since we're government and
since we're tied into NASA,

202
00:09:36,575 --> 00:09:40,179
we're not allowed to
Photoshop images per se.

203
00:09:40,179 --> 00:09:43,148
We can adjust the lighting and
the color and things like that,

204
00:09:43,148 --> 00:09:45,985
but we can't go in and
make changes to the images

205
00:09:45,985 --> 00:09:50,456
since we are a government
entity because of the fact

206
00:09:50,456 --> 00:09:54,293
that we're here to document
the work that NASA does,

207
00:09:54,293 --> 00:09:58,430
so we're here to make sure that
what we document is factual

208
00:09:58,430 --> 00:10:02,401
and not something where we
went and manipulated something.

209
00:10:02,401 --> 00:10:05,938
[Background Noise]

210
00:10:05,938 --> 00:10:10,909

We're often asked whether or not we feel like the change

211

00:10:10,909 --> 00:10:15,114
in digital photography,
where it's become more

212

00:10:15,114 --> 00:10:16,248
and more accessible

213

00:10:16,248 --> 00:10:21,687
to the regular person is a
problem for us in our job.

214

00:10:21,687 --> 00:10:23,122
That was something
that I worried

215

00:10:23,122 --> 00:10:26,659
about when people started
to get phones with pictures

216

00:10:26,659 --> 00:10:28,293
or camera capabilities.

217

00:10:28,293 --> 00:10:30,796
Everyone pretty much had a
camera everywhere they went

218

00:10:30,796 --> 00:10:31,497
to document.

219

00:10:31,497 --> 00:10:32,998
And it was a concern of ours.

220

00:10:32,998 --> 00:10:36,135
But we found so far that it
hasn't really changed our

221

00:10:36,135 --> 00:10:37,302
industry much.

222
00:10:37,302 --> 00:10:38,570
People still use us.

223
00:10:38,570 --> 00:10:42,174
They still value our
skills and our background

224
00:10:42,174 --> 00:10:44,576
for the photography that we do.

225
00:10:44,576 --> 00:10:47,813
One of the main reasons that
we are still here doing it,

226
00:10:47,813 --> 00:10:51,617
is because of the fact that
we do take the pictures,

227
00:10:51,617 --> 00:10:55,087
we archive the pictures, we
have access to the pictures,

228
00:10:55,087 --> 00:10:58,290
we know what we need to shoot,
we know how to shoot it,

229
00:10:58,290 --> 00:10:59,391
we know how to light it.

230
00:10:59,391 --> 00:11:01,994
We know the different
things that are required

231
00:11:01,994 --> 00:11:04,530
when we get them back,
whether they're sensitive,

232

00:11:04,530 --> 00:11:07,733

whether they're not, how to
keep sensitive photography

233

00:11:07,733 --> 00:11:09,968

versus the average
person going out,

234

00:11:09,968 --> 00:11:13,072

taking pictures, getting
an F-35 in the shot

235

00:11:13,072 --> 00:11:16,208

and causing all kinds of
chaos here at the base.

236

00:11:16,208 --> 00:11:20,179

>> So he'll come up and then
he'll meet with the ground guys

237

00:11:20,179 --> 00:11:23,682

and then he does walk around the
airplane, so we'll usually kind

238

00:11:23,682 --> 00:11:27,286

of photograph him as he does his
walk around and then...

239

00:11:27,286 --> 00:11:29,955

>> We often have interns that
come in during the summer

240

00:11:29,955 --> 00:11:32,391

that work with us to
hone their skills.

241

00:11:32,391 --> 00:11:36,595

And they seem to enjoy
working out here.

242

00:11:36,595 --> 00:11:39,098

It seems like there
are still a lot

243

00:11:39,098 --> 00:11:41,500

of younger people
interested in photography.

244

00:11:41,500 --> 00:11:44,269

A lot of what we
teach the kids is all

245

00:11:44,269 --> 00:11:46,105

of the different techniques
that we have to do,

246

00:11:46,105 --> 00:11:48,741

whether it's shooting a
portrait or a passport,

247

00:11:48,741 --> 00:11:53,245

or doing something out on the
flight line with the airplanes,

248

00:11:53,245 --> 00:11:56,515

or shooting a retirement,
or shooting a colloquium.

249

00:11:56,515 --> 00:11:58,751

It's all something
that we need to know.

250

00:11:58,751 --> 00:12:02,321

It's not that we're specialized
in one particular thing.

251

00:12:02,321 --> 00:12:05,290

We have to kind of know a
lot about all different kinds

252

00:12:05,290 --> 00:12:08,026

of lighting issues, where
the hangars are all different

253

00:12:08,026 --> 00:12:12,831

colors, or the different time
of day, things like that.

254

00:12:12,831 --> 00:12:17,436

So I think that it's good for
the young people to come out

255

00:12:17,436 --> 00:12:19,605

and work with us, because
they do learn a lot

256

00:12:19,605 --> 00:12:22,708

about many different types
of photography rather

257

00:12:22,708 --> 00:12:26,178

than being specialized in
advertising, or portrait,

258

00:12:26,178 --> 00:12:28,947

or studio, or something
like that.

259

00:12:28,947 --> 00:12:31,750

I guess, probably, my
coolest experience flying here

260

00:12:31,750 --> 00:12:35,320

at NASA Armstrong, or just
working in general, but happened

261

00:12:35,320 --> 00:12:38,056

to be a flight situation,
was when we worked

262

00:12:38,056 --> 00:12:44,997
on ferrying Endeavor from here,
basically Armstrong, to LAX.

263

00:12:44,997 --> 00:12:47,399
We also had about 30
landmarks that we had

264

00:12:47,399 --> 00:12:49,468
to photograph in-flight.

265

00:12:49,468 --> 00:12:53,639
And that was very difficult
to stay on target to get each

266

00:12:53,639 --> 00:12:57,576
and every one because even
though LA is kind of wide

267

00:12:57,576 --> 00:13:00,712
and spread out, when you're
at low levels the speeds

268

00:13:00,712 --> 00:13:04,216
that you travel, you hit,
like, one after another.

269

00:13:04,216 --> 00:13:06,852
And a lot of those you would
think from the ground are easy

270

00:13:06,852 --> 00:13:09,454
to see, but they are not very
easy to see from the air.

271

00:13:09,454 --> 00:13:12,491
Disneyland seems like a
large area from the ground,

272

00:13:12,491 --> 00:13:15,694
but in flight, you're over and
past it in a couple of seconds.

273
00:13:15,694 --> 00:13:18,330
One of the things that I really
love about the job as well is

274
00:13:18,330 --> 00:13:21,233
that we get to be exposed to
everything that happens here,

275
00:13:21,233 --> 00:13:24,736
whether it's, you know, working
on the budget with finance,

276
00:13:24,736 --> 00:13:27,306
whether it's working
on small business,

277
00:13:27,306 --> 00:13:28,640
or whether it's the engineers

278
00:13:28,640 --> 00:13:30,108
and the programs
or the projects.

279
00:13:30,108 --> 00:13:31,643
We don't just do one thing.

280
00:13:31,643 --> 00:13:34,780
We get to be doing everything
that works here at the Center.

281
00:13:34,780 --> 00:13:37,416
And that's always been
really intriguing to me