1
00:00:22,519 --> 00:00:19,279
nasa the national aeronautics and space

2
00:00:30,169 --> 00:00:22,529
administration presents aeronautics and

3
00:00:32,840 --> 00:00:30,179
space report since nineteen seventeen

4
00:00:34,819 --> 00:00:32,850
NASA's Langley Research Center Hampton

5
00:00:36,590 --> 00:00:34,829
Virginia has been serving this country's

6
00:00:48,180 --> 00:00:36,600
needs both in aeronautics and

7
00:00:52,840 --> 00:00:50,290
recalling some of the early history

8
00:00:54,460 --> 00:00:52,850
senior historian and curator for the

9
00:00:57,750 --> 00:00:54,470
Smithsonian's National Air and Space

10
00:01:00,820 --> 00:00:57,760
Museum mr. Paul Garber welcome to the

11
00:01:04,479 --> 00:01:00,830
Smithsonian Institution National Air and

12
00:01:06,609 --> 00:01:04,489
Space Museum the third head of this

13
00:01:08,890 --> 00:01:06,619

institution was Samuel Pierpont Langley

14
00:01:11,980 --> 00:01:08,900
for whom the laboratory at Hampton

15
00:01:14,830 --> 00:01:11,990
Virginia was named and his successor

16
00:01:18,160 --> 00:01:14,840
Charles Doolittle Wolcott as early as

17
00:01:21,730 --> 00:01:18,170
1912 realized that we should have here

18
00:01:24,749 --> 00:01:21,740
in America a laboratory where scientific

19
00:01:28,540 --> 00:01:24,759
investigations could be made of the

20
00:01:31,840 --> 00:01:28,550
basic facts of aeronautics so that our

21
00:01:36,820 --> 00:01:31,850
aircraft could be developed further this

22
00:01:40,810 --> 00:01:36,830
is probably the most famous award in the

23
00:01:43,690 --> 00:01:40,820
history of flight it was donated in 1912

24
00:01:46,690 --> 00:01:43,700
by Robert J Collier who was then head of

25
00:01:49,300 --> 00:01:46,700
the Aero Club of America it is awarded

26
00:01:52,480 --> 00:01:49,310
annually for the greatest accomplishment

27
00:01:54,820 --> 00:01:52,490
in aeronautics or astronautics the value

28
00:01:59,800 --> 00:01:54,830
of which has been proven by a previous

29
00:02:04,210 --> 00:01:59,810
year of practical use eight times those

30
00:02:06,940 --> 00:02:04,220
awards have been either directly to naca

31
00:02:08,740 --> 00:02:06,950
or na sa that is the national advisory

32
00:02:09,760 --> 00:02:08,750
committee for aeronautics or the

33
00:02:12,610 --> 00:02:09,770
National Aeronautics and Space

34
00:02:14,980 --> 00:02:12,620
Administration either directly or in

35
00:02:19,170 --> 00:02:14,990
connection with some development with

36
00:02:24,130 --> 00:02:19,180
which they were associated the award for

37
00:02:27,309 --> 00:02:24,140
1929 was the first one to naca and that

38
00:02:29,320 --> 00:02:27,319

was for the engine cowling on the front

39
00:02:33,040 --> 00:02:29,330
of an airplane or on the engines of an

40
00:02:36,760 --> 00:02:33,050
airplane this cowling was a cylindrical

41
00:02:39,190 --> 00:02:36,770
sleeve that fits over the cylinders of

42
00:02:43,660 --> 00:02:39,200
the engine now on the spirit of st.

43
00:02:46,449 --> 00:02:43,670
Louis those cylinders protrude and by

44
00:02:49,119 --> 00:02:46,459
protruding cause so much friction of the

45
00:02:51,640 --> 00:02:49,129
air that they are a serious dragged to

46
00:02:55,200 --> 00:02:51,650
the speed of the aircraft but by

47
00:02:58,540 --> 00:02:55,210
development of the NACA cowling that

48
00:03:00,430 --> 00:02:58,550
engine could be so enshrouded so is

49
00:03:03,370 --> 00:03:00,440
smooth so streamlined

50
00:03:05,380 --> 00:03:03,380
while at the same time the engine itself

51
00:03:07,570 --> 00:03:05,390
was better cooled that the performance

52
00:03:11,680 --> 00:03:07,580
of aircraft was increased greatly in

53
00:03:13,750 --> 00:03:11,690
fact the application of that cowling to

54
00:03:17,350 --> 00:03:13,760
such aircraft as the Lockheed Air

55
00:03:22,330 --> 00:03:17,360
Express and to the win he may increase

56
00:03:24,520 --> 00:03:22,340
the speed appreciably it was during the

57
00:03:26,590 --> 00:03:24,530
years following World War one that

58
00:03:28,510 --> 00:03:26,600
Captain Charles a Lindbergh made the

59
00:03:30,550 --> 00:03:28,520
first solo flight across the Atlantic

60
00:03:33,610 --> 00:03:30,560
drawing worldwide attention to the

61
00:03:35,860 --> 00:03:33,620
potential of the airplane dr. robert h

62
00:03:38,470 --> 00:03:35,870
goddard successfully developed and fired

63
00:03:41,350 --> 00:03:38,480

liquid-fueled rocket motors events which

64
00:03:44,680 --> 00:03:41,360
would influence later history these were

65
00:03:46,750 --> 00:03:44,690
the post-war years at Langley wind

66
00:03:48,910 --> 00:03:46,760
tunnels were being constructed wind

67
00:03:51,310 --> 00:03:48,920
tunnels able to test models in free

68
00:03:53,560 --> 00:03:51,320
flight making accurate measurements and

69
00:03:56,050 --> 00:03:53,570
corrections before a plane was built

70
00:03:59,260 --> 00:03:56,060
pointing the way to improved airplane

71
00:04:01,840 --> 00:03:59,270
design concepts to help determine the

72
00:04:04,150 --> 00:04:01,850
spin characteristics of aircraft a spin

73
00:04:06,400 --> 00:04:04,160
tunnel was so designed that models could

74
00:04:09,699 --> 00:04:06,410
be spun simulating full-scale free

75
00:04:11,920 --> 00:04:09,709
flight this same facility was used also

76
00:04:15,870 --> 00:04:11,930
to test out models of all of the man's

77
00:04:19,510 --> 00:04:15,880
spacecraft Mercury Gemini and Apollo

78
00:04:22,330 --> 00:04:19,520
during the second decade at Langley 1927

79
00:04:24,159 --> 00:04:22,340
to 1937 the dirigible plagued by a

80
00:04:29,050 --> 00:04:24,169
series of tragic accidents and the

81
00:04:29,060 --> 00:04:31,360
you

82
00:04:36,730 --> 00:04:34,240
in their place the all metal single

83
00:04:39,370 --> 00:04:36,740
wincraft predecessors of our commercial

84
00:04:42,040 --> 00:04:39,380
airlines planes with two rather than

85
00:04:47,680 --> 00:04:42,050
three air-cooled engines and retractable

86
00:04:49,300 --> 00:04:47,690
landing gear the NACA was asked to

87
00:04:51,790 --> 00:04:49,310
determine the conditions which caused

88
00:04:54,370 --> 00:04:51,800

ice formation on aircraft and develop

89
00:04:56,650 --> 00:04:54,380
means of preventing it these studies

90
00:04:59,530 --> 00:04:56,660
grew into a major effort that did in

91
00:05:01,570 --> 00:04:59,540
fact find a solution with the 1946

92
00:05:04,540 --> 00:05:01,580
awarding of the collier trophy for the

93
00:05:06,909 --> 00:05:04,550
pioneering research to serve the needs

94
00:05:08,860 --> 00:05:06,919
of the seaplane and amphibious airplane

95
00:05:10,960 --> 00:05:08,870
designers the first of Langley's

96
00:05:13,810 --> 00:05:10,970
hydrodynamic test tanks were made ready

97
00:05:15,760 --> 00:05:13,820
for operation towing a model Hall

98
00:05:18,400 --> 00:05:15,770
through the water up to the point of a

99
00:05:21,180 --> 00:05:18,410
simulated takeoff speed engineers could

100
00:05:24,790 --> 00:05:21,190
suggest improvements in the basic design

101
00:05:26,740 --> 00:05:24,800
in later years Mercury Gemini and Apollo

102
00:05:30,400 --> 00:05:26,750
water landing techniques would be

103
00:05:32,740 --> 00:05:30,410
checked out using the same tank World

104
00:05:35,320 --> 00:05:32,750
War 2 dominated Langley's third decade

105
00:05:37,810 --> 00:05:35,330
the urgency of the war dictated the

106
00:05:40,390 --> 00:05:37,820
programs of this period programs aimed

107
00:05:42,960 --> 00:05:40,400
many times at curing the immediate ills

108
00:05:44,950 --> 00:05:42,970
of already flying combat aircraft

109
00:05:48,580 --> 00:05:44,960
typical of these were the ditching

110
00:05:52,970 --> 00:05:48,590
studies here a highly instrumented be 24

111
00:05:58,470 --> 00:05:55,740
research aimed at giving over the water

112
00:06:03,860 --> 00:05:58,480
combat crews a better chance of survival

113
00:06:08,690 --> 00:06:06,230

other work during the war time period

114
00:06:11,240 --> 00:06:08,700
included studies of airplane stalling

115
00:06:13,310 --> 00:06:11,250
characteristics aircraft loads in

116
00:06:19,010 --> 00:06:13,320
maneuvering flight and problems

117
00:06:21,200 --> 00:06:19,020
associated with diving and braking near

118
00:06:23,060 --> 00:06:21,210
the end of the war Langley scientists

119
00:06:25,760 --> 00:06:23,070
were working on the idea of wings

120
00:06:28,040 --> 00:06:25,770
Sweetback an idea for attaining higher

121
00:06:29,330 --> 00:06:28,050
flight speeds one method of

122
00:06:32,210 --> 00:06:29,340
experimentation was with

123
00:06:34,130 --> 00:06:32,220
rocket-propelled models these early

124
00:06:39,890 --> 00:06:34,140
studies can be seen in present flying

125
00:06:41,950 --> 00:06:39,900
airplanes high speed presented some

126
00:06:44,720 --> 00:06:41,960
problems of ejecting from an airplane

127
00:06:47,780 --> 00:06:44,730
this test pilot was subjected to wind

128
00:06:50,650 --> 00:06:47,790
tunnel blasts at speeds up to 400 miles

129
00:06:54,890 --> 00:06:50,660
per hour to check human tolerance

130
00:06:57,470 --> 00:06:54,900
October 1947 Captain Charles E Yeager

131
00:06:59,720 --> 00:06:57,480
piloting the bell x-1 flew through the

132
00:07:02,350 --> 00:06:59,730
speed of sound for the first time and

133
00:07:04,970 --> 00:07:02,360
pioneered the way to supersonic flight

134
00:07:07,010 --> 00:07:04,980
speeds made possible by the long

135
00:07:10,730 --> 00:07:07,020
research effort that had begun early in

136
00:07:12,260 --> 00:07:10,740
the war at Langley the next decade

137
00:07:15,020 --> 00:07:12,270
nineteen forty eight to nineteen

138
00:07:17,690 --> 00:07:15,030

fifty-seven research continued on the x

139
00:07:20,720 --> 00:07:17,700
series of aircraft these included the X

140
00:07:23,510 --> 00:07:20,730
3 X 5 and the most significant airplane

141
00:07:26,150 --> 00:07:23,520
design the x-15 hypersonic research

142
00:07:29,960 --> 00:07:26,160
aircraft shown here being proved out in

143
00:07:32,690 --> 00:07:29,970
a Langley wind tunnel today the x-15

144
00:07:34,430 --> 00:07:32,700
travels at speeds in excess of 4,000

145
00:07:35,870 --> 00:07:34,440
miles per hour and is returning

146
00:07:38,330 --> 00:07:35,880
information about high-speed

147
00:07:43,290 --> 00:07:38,340
high-altitude flight as it maneuvers

148
00:07:47,950 --> 00:07:46,090
research on flight tests of helicopters

149
00:07:52,150 --> 00:07:47,960
continued to take place to help

150
00:07:54,219 --> 00:07:52,160
determine future designs a landing loads

151
00:07:57,040 --> 00:07:54,229
track began operation during this period

152
00:07:58,930 --> 00:07:57,050
with it aircraft landing gear could be

153
00:08:01,840 --> 00:07:58,940
subjected to the same type of load

154
00:08:04,270 --> 00:08:01,850
stress encountered during landing later

155
00:08:06,340 --> 00:08:04,280
tests identified the problem of aircraft

156
00:08:08,980 --> 00:08:06,350
and automobile hydroplaning as a result

157
00:08:14,290 --> 00:08:08,990
of water drenched pavements a condition

158
00:08:16,600 --> 00:08:14,300
that can cause loss of control speaking

159
00:08:19,089 --> 00:08:16,610
about his years in aviation general

160
00:08:20,409 --> 00:08:19,099
james h Doolittle former chairman of the

161
00:08:24,619 --> 00:08:20,419
national advisory committee for

162
00:08:30,240 --> 00:08:27,570
this is my 50th year on aviation I

163
00:08:32,790 --> 00:08:30,250

started in nineteen seventeen in those

164
00:08:34,649 --> 00:08:32,800
days the aeroplane was very simple there

165
00:08:37,829 --> 00:08:34,659
was a stick and wire contraption covered

166
00:08:39,659 --> 00:08:37,839
with cloth and if somebody had drawn a

167
00:08:40,980 --> 00:08:39,669
picture of a modern-day airplane we

168
00:08:43,589 --> 00:08:40,990
would have thought him slightly mad

169
00:08:45,870 --> 00:08:43,599
what's the best way to explain what's

170
00:08:47,610 --> 00:08:45,880
happened in aviation is to say that in

171
00:08:50,610 --> 00:08:47,620
those days there was a fixed landing

172
00:08:53,910 --> 00:08:50,620
gear simple engine simple airframe since

173
00:08:55,980 --> 00:08:53,920
then came flats flaps flops retractable

174
00:08:58,500 --> 00:08:55,990
landing gears jet engine air

175
00:09:01,800 --> 00:08:58,510
conditioning pressurization and all of

176
00:09:04,319 --> 00:09:01,810
the multiple manifold communicational

177
00:09:06,139 --> 00:09:04,329
and navigational equipment all the

178
00:09:08,910 --> 00:09:06,149
military equipment that's gone in and

179
00:09:12,269 --> 00:09:08,920
the aeroplane from a very simple thing

180
00:09:15,060 --> 00:09:12,279
has become very complex the most modern

181
00:09:17,910 --> 00:09:15,070
airplanes today cost something over five

182
00:09:22,230 --> 00:09:17,920
million dollars or a thousand times more

183
00:09:24,329 --> 00:09:22,240
than they cost in 1917 this gives some

184
00:09:28,439 --> 00:09:24,339
indication of the increased complexity

185
00:09:31,139 --> 00:09:28,449
of aviation and of course the improved

186
00:09:34,860 --> 00:09:31,149
performance and utility of aircraft

187
00:09:37,920 --> 00:09:34,870
today but part of that the force is due

188
00:09:40,230 --> 00:09:37,930

to a reduction in the purchasing power

189
00:09:41,819 --> 00:09:40,240
of the dollar but most of it is due to

190
00:09:44,250 --> 00:09:41,829
the things that been put in the aircraft

191
00:09:47,850 --> 00:09:44,260
now if we look at this aeroplane over

192
00:09:50,939 --> 00:09:47,860
here we see a subsonic aeroplanes flying

193
00:09:54,449 --> 00:09:50,949
it around 600 miles an hour crossing the

194
00:09:58,110 --> 00:09:54,459
continent in about five hours I see in

195
00:10:00,990 --> 00:09:58,120
the future the supersonic airplane that

196
00:10:04,290 --> 00:10:01,000
will cross the continent in something

197
00:10:07,550 --> 00:10:04,300
over an hour and Fire prior to that

198
00:10:11,790 --> 00:10:07,560
there's a very large airplane the Boeing

199
00:10:14,069 --> 00:10:11,800
747 the lockheed c-5 a which will

200
00:10:17,130 --> 00:10:14,079
greatly reduce the cost of air travel

201
00:10:19,259 --> 00:10:17,140
and tremendously increase the amount of

202
00:10:20,430 --> 00:10:19,269
air travel it will have a profound

203
00:10:23,430 --> 00:10:20,440
effect

204
00:10:26,570 --> 00:10:23,440
on air cargo on the amount of our care

205
00:10:31,380 --> 00:10:26,580
cargo that's scary there will also be

206
00:10:33,750 --> 00:10:31,390
the VTOL the sto oil aircraft that will

207
00:10:37,200 --> 00:10:33,760
make it more convenient to fly and will

208
00:10:43,820 --> 00:10:37,210
save time over short distances all of

209
00:10:48,570 --> 00:10:46,829
to study the heating problems generated

210
00:10:51,389 --> 00:10:48,580
by reentry flight into the Earth's

211
00:10:54,030 --> 00:10:51,399
atmosphere arc jet facilities were put

212
00:10:55,980 --> 00:10:54,040
into use at Langley with the orbiting of

213
00:10:57,780 --> 00:10:55,990

the Russian Sputnik getting men into

214
00:11:00,030 --> 00:10:57,790
space and returning him safely through

215
00:11:04,949 --> 00:11:00,040
the searing heat of reentry became a

216
00:11:06,780 --> 00:11:04,959
high-priority problem now in the decade

217
00:11:09,380 --> 00:11:06,790
of the 60s the Langley Research Center

218
00:11:11,760 --> 00:11:09,390
is charged with a dual responsibility

219
00:11:13,530 --> 00:11:11,770
continued aeronautical research and

220
00:11:16,650 --> 00:11:13,540
contribute to the science of space

221
00:11:18,960 --> 00:11:16,660
flight a space task group originally

222
00:11:22,050 --> 00:11:18,970
formed at Langley went on to become the

223
00:11:23,730 --> 00:11:22,060
manned spacecraft Center by the end of

224
00:11:28,650 --> 00:11:23,740
the Mercury program there was no doubt

225
00:11:33,389 --> 00:11:31,110
at the White House President Kennedy

226
00:11:36,240 --> 00:11:33,399
awarded the collier trophy to the first

227
00:11:38,699 --> 00:11:36,250
seven astronauts and I'm particularly

228
00:11:40,590 --> 00:11:38,709
glad that the decision has made been

229
00:11:43,699 --> 00:11:40,600
made to award the trophy of this year to

230
00:11:46,319 --> 00:11:43,709
them I think it on is a extraordinary

231
00:11:50,210 --> 00:11:46,329
page in American history as well as in

232
00:11:53,309 --> 00:11:50,220
the history of flight and I hope that

233
00:11:56,579 --> 00:11:53,319
this award which in a sense closes out

234
00:12:01,110 --> 00:11:56,589
this particular phase of the space

235
00:12:04,710 --> 00:12:01,120
program will be a stimulus to them and

236
00:12:08,429 --> 00:12:04,720
to other astronauts who will carry our

237
00:12:10,980 --> 00:12:08,439
flag to the moon and perhaps even some

238
00:12:30,910 --> 00:12:10,990

day beyond so it's great pleasure I

239
00:12:36,350 --> 00:12:32,990
here are some of Langley's other

240
00:12:38,570 --> 00:12:36,360
projects echo an automatically inflating

241
00:12:41,360 --> 00:12:38,580
satellite grew out of a Langley concept

242
00:12:43,070 --> 00:12:41,370
and was developed their rendezvous and

243
00:12:45,320 --> 00:12:43,080
docking critical to the Apollo moon

244
00:12:51,800 --> 00:12:45,330
program was studied and determined

245
00:12:54,260 --> 00:12:51,810
feasible commercial supersonic transport

246
00:12:56,770 --> 00:12:54,270
the initial configuration was developed

247
00:13:00,680 --> 00:12:56,780
to meet the unique flight requirements

248
00:13:03,350 --> 00:13:00,690
lifting bodies this the so-called HL 10

249
00:13:05,990 --> 00:13:03,360
craft which may someday shuttle men and

250
00:13:12,290 --> 00:13:06,000
equipment through space then land like a

251
00:13:15,010 --> 00:13:12,300
conventional plane at an airport VTOL

252
00:13:17,600 --> 00:13:15,020
vertical takeoff or landing aircraft

253
00:13:20,180 --> 00:13:17,610
forerunners of intercity transports

254
00:13:23,570 --> 00:13:20,190
which fly forward at high speed and then

255
00:13:26,000 --> 00:13:23,580
set down like a helicopter the concept

256
00:13:29,990 --> 00:13:26,010
for this tilt wincraft evolved into the

257
00:13:32,810 --> 00:13:30,000
first operational VTOL transport lunar

258
00:13:34,880 --> 00:13:32,820
orbiter a series of moon mapping craft

259
00:13:37,010 --> 00:13:34,890
surveying safe landing sites for

260
00:13:40,340 --> 00:13:37,020
American astronauts conceived and

261
00:13:43,360 --> 00:13:40,350
managed by Langley scientists airport

262
00:13:46,460 --> 00:13:43,370
landing studies and the list could go on

263
00:13:48,320 --> 00:13:46,470

264
00:13:51,170 --> 00:13:48,330
years it has risen from a few buildings

265
00:13:53,300 --> 00:13:51,180
and facilities testing out biplanes to

266
00:14:04,040 --> 00:13:53,310
join NASA's national effort in both

267
00:14:10,009 --> 00:14:07,090
but it's really 50 years of people

268
00:14:24,910 --> 00:14:10,019
people make the machines and design the

269
00:14:30,079 --> 00:14:27,230
this has been an Aeronautics and Space