1
00:00:09,270 --> 00:00:06,550
it was a year of preparation especially

2
00:00:10,950 --> 00:00:09,280
for the reusable space shuttle

3
00:00:13,749 --> 00:00:10,960
astronomers were able to point an

4
00:00:15,509 --> 00:00:13,759
orbiting telescope at stars while aiming

5
00:00:18,230 --> 00:00:15,519
and making corrections much like

6
00:00:20,790 --> 00:00:18,240
ground-based observatories

7
00:00:24,390 --> 00:00:20,800
pioneer spacecraft arrived at venus and

8
00:00:26,390 --> 00:00:24,400
landed on that planet's shrouded surface

9
00:00:28,870 --> 00:00:26,400
the voyagers continued their journey

10
00:00:31,029 --> 00:00:28,880
toward jupiter and saturn

11
00:00:33,350 --> 00:00:31,039
with the department of energy nasa built

12
00:00:34,870 --> 00:00:33,360
a wind generator for a small new mexico

13
00:00:37,110 --> 00:00:34,880

town

14
00:00:39,190 --> 00:00:37,120
and in aeronautics a wide range of

15
00:00:48,150 --> 00:00:39,200
research projects to improve both

16
00:00:52,709 --> 00:00:50,229
if all goes according to schedule scenes

17
00:00:55,189 --> 00:00:52,719
like this a reusable space shuttle

18
00:00:58,150 --> 00:00:55,199
making its final approach to land will

19
00:00:59,910 --> 00:00:58,160
be a common sight beginning next fall

20
00:01:01,910 --> 00:00:59,920
many of the tests and much of the

21
00:01:06,310 --> 00:01:01,920
training to prepare for that historic

22
00:01:08,870 --> 00:01:06,320
first flight took place in 1978

23
00:01:11,270 --> 00:01:08,880
47 year old john young veteran of two

24
00:01:13,190 --> 00:01:11,280
gemini and two apollo space flights will

25
00:01:14,630 --> 00:01:13,200
be commander for the first manned

26
00:01:16,789 --> 00:01:14,640
shuttle mission

27
00:01:18,789 --> 00:01:16,799
here he practices making landings in a

28
00:01:21,109 --> 00:01:18,799
space shuttle simulator at the johnson

29
00:01:22,789 --> 00:01:21,119
space center with robert crippen the 40

30
00:01:28,550 --> 00:01:22,799
year old astronaut who will fly with

31
00:01:32,230 --> 00:01:30,310
anticipating the space shuttle's flight

32
00:01:35,109 --> 00:01:32,240
schedule in the years ahead nasa

33
00:01:37,749 --> 00:01:35,119
selected 35 new candidate astronauts in

34
00:01:43,270 --> 00:01:37,759
1978 to begin training as shuttle

35
00:01:48,469 --> 00:01:46,149
the 35 including six women were chosen

36
00:02:07,910 --> 00:01:48,479
from nearly 8 000 applicants and will be

37
00:02:12,869 --> 00:02:10,229
enterprise was flown in its now familiar

38
00:02:14,790 --> 00:02:12,879

plane on plane berth from california to

39
00:02:22,470 --> 00:02:14,800
nasa's marshall space flight center in

40
00:02:25,750 --> 00:02:24,309
for the first time all the major

41
00:02:27,830 --> 00:02:25,760
components of the space shuttle

42
00:02:29,270 --> 00:02:27,840
transportation system came together for

43
00:02:31,270 --> 00:02:29,280
testing

44
00:02:33,910 --> 00:02:31,280
when completely assembled the shuttle

45
00:02:35,430 --> 00:02:33,920
orbiter will sit astride two recoverable

46
00:02:39,190 --> 00:02:35,440
solid rockets

47
00:02:41,030 --> 00:02:39,200
and atop a giant external fuel tank

48
00:02:43,110 --> 00:02:41,040
the entire system was subjected to

49
00:02:48,790 --> 00:02:43,120
vibrations similar to those that will

50
00:02:52,869 --> 00:02:50,790
at the thigh call corporation facility

51
00:02:55,990 --> 00:02:52,879
in utah a shuttle booster that will

52
00:02:58,470 --> 00:02:56,000
produce about 2.65 million pounds of

53
00:03:01,910 --> 00:02:58,480
thrust at launch was successfully test

54
00:03:05,589 --> 00:03:03,750
each of the space shuttle's three main

55
00:03:07,910 --> 00:03:05,599
engines that will provide the orbiter

56
00:03:09,750 --> 00:03:07,920
with its primary power from launch pad

57
00:03:12,869 --> 00:03:09,760
almost to earth orbit were also

58
00:03:16,390 --> 00:03:14,949
work is continuing on the second shuttle

59
00:03:18,710 --> 00:03:16,400
orbiter at the rockwell plant in

60
00:03:20,710 --> 00:03:18,720
california this is the spacecraft that

61
00:03:22,390 --> 00:03:20,720
will actually make the first flight with

62
00:03:25,670 --> 00:03:22,400
astronauts young and crippen at the

63
00:03:29,350 --> 00:03:27,910

looking farther ahead marshall space

64
00:03:31,430 --> 00:03:29,360
flight center engineers have been

65
00:03:33,830 --> 00:03:31,440
studying problems that astronauts may

66
00:03:36,149 --> 00:03:33,840
face during future shuttle missions and

67
00:03:38,070 --> 00:03:36,159
they are doing it underwater

68
00:03:39,910 --> 00:03:38,080
this is one of the few ways that near

69
00:03:43,270 --> 00:03:39,920
weightless maneuvers can be practiced

70
00:03:47,190 --> 00:03:46,149
1978 was a very busy year for space

71
00:03:48,949 --> 00:03:47,200
science

72
00:03:51,190 --> 00:03:48,959
one of the most ambitious missions

73
00:03:52,789 --> 00:03:51,200
involved two pioneer spacecraft that

74
00:03:54,710 --> 00:03:52,799
were launched toward a rendezvous and

75
00:03:56,229 --> 00:03:54,720
landing on this planet

76
00:03:58,229 --> 00:03:56,239
venus

77
00:04:00,229 --> 00:03:58,239
scientists believe that by studying the

78
00:04:02,869 --> 00:04:00,239
weather of venus they can learn about

79
00:04:04,949 --> 00:04:02,879
our weather here on earth

80
00:04:07,429 --> 00:04:04,959
the pioneer orbiter spacecraft is

81
00:04:09,830 --> 00:04:07,439
programmed to circle venus every 24

82
00:04:14,550 --> 00:04:09,840
hours studying the upper fringes of the

83
00:04:17,030 --> 00:04:14,560
venusian atmosphere as it travels along

84
00:04:19,349 --> 00:04:17,040
the second spacecraft the multi-probe is

85
00:04:21,749 --> 00:04:19,359
made up of a space bus with four

86
00:04:23,670 --> 00:04:21,759
data-gathering spheres that plunge down

87
00:04:25,990 --> 00:04:23,680
simultaneously to different parts of

88
00:04:28,550 --> 00:04:26,000

venus returning valuable information

89
00:04:31,670 --> 00:04:28,560
about its 900 degree surface and carbon

90
00:04:33,830 --> 00:04:31,680
dioxide environment

91
00:04:38,790 --> 00:04:33,840
this is a computer representation of the

92
00:04:43,110 --> 00:04:41,350
two unmanned voyager spacecraft are on

93
00:04:44,950 --> 00:04:43,120
route to jupiter now

94
00:04:47,189 --> 00:04:44,960
the first voyager will reach the planet

95
00:04:49,189 --> 00:04:47,199
in march 1979

96
00:04:50,790 --> 00:04:49,199
followed by the second spacecraft four

97
00:04:53,110 --> 00:04:50,800
months later

98
00:04:54,950 --> 00:04:53,120
then on to saturn

99
00:04:58,070 --> 00:04:54,960
at the time of closest encounter on

100
00:05:02,950 --> 00:04:58,080
november 12 1980 voyager 1 will have

101
00:05:04,870 --> 00:05:02,960
traveled 1.4 billion miles through space

102
00:05:07,510 --> 00:05:04,880
the voyager missions make it possible

103
00:05:09,590 --> 00:05:07,520
for scientists to go back in time and

104
00:05:11,830 --> 00:05:09,600
sample the conditions from which the sun

105
00:05:15,950 --> 00:05:11,840
and planets including the earth are

106
00:05:20,950 --> 00:05:17,830
iue

107
00:05:23,110 --> 00:05:20,960
international ultraviolet explorer is a

108
00:05:25,909 --> 00:05:23,120
telescope in space which is operated

109
00:05:27,830 --> 00:05:25,919
effectively in real time by astronomers

110
00:05:29,510 --> 00:05:27,840
on the ground

111
00:05:30,870 --> 00:05:29,520
visiting astronomers at the goddard

112
00:05:33,510 --> 00:05:30,880
space flight center can have the

113
00:05:36,070 --> 00:05:33,520

telescope pointed decide what data to

114
00:05:37,670 --> 00:05:36,080
take and modify their measurements as

115
00:05:40,710 --> 00:05:37,680
they observe

116
00:05:42,550 --> 00:05:40,720
with craft like iue scientists can begin

117
00:05:45,670 --> 00:05:42,560
thinking in terms of observatories in

118
00:05:48,629 --> 00:05:45,680
space as facilities

119
00:05:50,830 --> 00:05:48,639
also launched in 1978 the second in a

120
00:05:53,670 --> 00:05:50,840
series of high energy astronomy

121
00:05:56,310 --> 00:05:53,680
observatories he 02

122
00:05:59,029 --> 00:05:56,320
the 7000 pound spacecraft carries a

123
00:06:00,790 --> 00:05:59,039
large x-ray telescope with four major

124
00:06:04,309 --> 00:06:00,800
experiments which can be pointed at

125
00:06:06,469 --> 00:06:04,319
specific objects to study them in detail

126
00:06:08,469 --> 00:06:06,479
the high energy explorers are giving

127
00:06:10,710 --> 00:06:08,479
astronomers a different view of our

128
00:06:15,749 --> 00:06:10,720
universe and helping us to better

129
00:06:19,909 --> 00:06:17,670
the space telescope moved through

130
00:06:21,909 --> 00:06:19,919
another manufacturing phase this year at

131
00:06:24,230 --> 00:06:21,919
the corning glassworks in upstate new

132
00:06:27,510 --> 00:06:24,240
york and is scheduled for deployment by

133
00:06:29,590 --> 00:06:27,520
the shuttle orbiter in 1983.

134
00:06:31,990 --> 00:06:29,600
looking from space with instruments in

135
00:06:33,909 --> 00:06:32,000
space we can see the universe in ways

136
00:06:35,670 --> 00:06:33,919
that are impossible from the ground

137
00:06:41,189 --> 00:06:35,680
bringing us closer to even greater

138
00:06:46,950 --> 00:06:42,950

there was continued and increased

139
00:06:48,390 --> 00:06:46,960
emphasis on applications in 1978

140
00:06:51,430 --> 00:06:48,400
landsat 3

141
00:06:53,430 --> 00:06:51,440
a remote sensing spacecraft was orbited

142
00:06:55,590 --> 00:06:53,440
efforts like these over the next decade

143
00:06:57,749 --> 00:06:55,600
will try to develop a capability to

144
00:07:00,629 --> 00:06:57,759
watch and understand what's happening on

145
00:07:02,390 --> 00:07:00,639
the surface of the earth land and water

146
00:07:04,070 --> 00:07:02,400
and to put all that data together in

147
00:07:06,070 --> 00:07:04,080
such a way that it can be used as

148
00:07:09,749 --> 00:07:06,080
management information for the global

149
00:07:14,469 --> 00:07:11,990
before it's so far unexplained short

150
00:07:17,029 --> 00:07:14,479
circuit the first csat collected data

151
00:07:19,029 --> 00:07:17,039
for 99 days

152
00:07:21,749 --> 00:07:19,039
what it returned during that time were

153
00:07:24,790 --> 00:07:21,759
images of sea ice waves coastal

154
00:07:27,510 --> 00:07:24,800
conditions and various land forms

155
00:07:29,430 --> 00:07:27,520
it also measured sea surface wind speeds

156
00:07:31,589 --> 00:07:29,440
and temperatures

157
00:07:33,749 --> 00:07:31,599
project scientists expect it will take

158
00:07:39,589 --> 00:07:33,759
more than a year and a half to process

159
00:07:44,550 --> 00:07:42,309
this is beth a perfectly healthy child

160
00:07:46,710 --> 00:07:44,560
of a nasa employee at the johnson space

161
00:07:48,870 --> 00:07:46,720
center in houston texas

162
00:07:51,110 --> 00:07:48,880
she is shown here testing out the fit

163
00:07:53,189 --> 00:07:51,120

and mobility of an isolation suit that

164
00:07:56,950 --> 00:07:53,199
can be used by a youngster with a rare

165
00:08:00,150 --> 00:07:56,960
disorder known as severe combined immune

166
00:08:01,990 --> 00:08:00,160
deficiency disease

167
00:08:03,670 --> 00:08:02,000
because of his inability to fight off

168
00:08:05,270 --> 00:08:03,680
even the most common germs

169
00:08:07,350 --> 00:08:05,280
seven-year-old david has had to be

170
00:08:09,110 --> 00:08:07,360
confined in sterile isolation since

171
00:08:11,350 --> 00:08:09,120
birth

172
00:08:13,510 --> 00:08:11,360
the nasa developed isolation suit now

173
00:08:18,469 --> 00:08:13,520
allows david to get out and at least do

174
00:08:22,469 --> 00:08:20,790
ben abruzzo and maxie anderson

175
00:08:24,950 --> 00:08:22,479
two of the three men that crossed the

176
00:08:26,790 --> 00:08:24,960
atlantic using a helium-filled balloon

177
00:08:28,309 --> 00:08:26,800
stopped by the goddard space flight

178
00:08:30,230 --> 00:08:28,319
center to meet some of the people who

179
00:08:38,230 --> 00:08:30,240
monitored their flight with the help of

180
00:08:42,630 --> 00:08:40,389
on their first attempt the nimbus-6

181
00:08:44,630 --> 00:08:42,640
beacon made it possible to alert air sea

182
00:08:45,670 --> 00:08:44,640
rescue when they became lost in a heavy

183
00:08:47,910 --> 00:08:45,680
storm

184
00:08:49,829 --> 00:08:47,920
so for the second try ben abruzzo said

185
00:08:52,150 --> 00:08:49,839
they decided to take along an extra

186
00:08:53,670 --> 00:08:52,160
beacon on the second flight uh because

187
00:08:55,990 --> 00:08:53,680
of uh

188
00:08:57,910 --> 00:08:56,000

the fact that we knew that the only link

189
00:09:00,310 --> 00:08:57,920
we had with the world on the first

190
00:09:03,190 --> 00:09:00,320
flight was a satellite transmitter we

191
00:09:05,829 --> 00:09:03,200
had two and again the uh information

192
00:09:09,430 --> 00:09:05,839
came to us in flight telling us

193
00:09:11,430 --> 00:09:09,440
of our course and our uh position

194
00:09:14,150 --> 00:09:11,440
it confirmed

195
00:09:15,190 --> 00:09:14,160
the weather data that

196
00:09:16,949 --> 00:09:15,200
our

197
00:09:18,550 --> 00:09:16,959
base station had and allowed us to

198
00:09:20,550 --> 00:09:18,560
change altitudes

199
00:09:22,389 --> 00:09:20,560
properly so that we were able to

200
00:09:23,269 --> 00:09:22,399
complete the flight successfully and in

201
00:09:25,430 --> 00:09:23,279
fact

202
00:09:28,230 --> 00:09:25,440
on the tail end of it we changed

203
00:09:29,990 --> 00:09:28,240
altitude and vectored ourselves onto a

204
00:09:31,509 --> 00:09:30,000
very close

205
00:09:43,190 --> 00:09:31,519
destination

206
00:09:47,990 --> 00:09:45,990
last january the first large operational

207
00:09:50,150 --> 00:09:48,000
wind generator to be used in the united

208
00:09:51,990 --> 00:09:50,160
states in several decades began

209
00:09:55,350 --> 00:09:52,000
producing electricity

210
00:09:57,430 --> 00:09:55,360
the place clayton new mexico population

211
00:09:59,269 --> 00:09:57,440
about 2900

212
00:10:01,670 --> 00:09:59,279
the project is funded by the department

213
00:10:04,470 --> 00:10:01,680

of energy and managed by nasa's lewis

214
00:10:06,389 --> 00:10:04,480
research center in cleveland the 100

215
00:10:08,870 --> 00:10:06,399
foot high wind generator is capable of

216
00:10:11,269 --> 00:10:08,880
producing 200 kilowatts that feed

217
00:10:14,230 --> 00:10:11,279
directly into clayton's utility system

218
00:10:15,910 --> 00:10:14,240
about enough to electrify 60 homes

219
00:10:17,750 --> 00:10:15,920
the research is aimed at improving

220
00:10:20,069 --> 00:10:17,760
performance and helping determine the

221
00:10:24,310 --> 00:10:20,079
future cost of electric power generated

222
00:10:29,190 --> 00:10:26,630
in aeronautics the emphasis is on basic

223
00:10:32,230 --> 00:10:29,200
research and basic technology preparing

224
00:10:34,150 --> 00:10:32,240
the way for future advances in aviation

225
00:10:36,069 --> 00:10:34,160
at the same time nasa continues to

226
00:10:41,990 --> 00:10:36,079
develop technologies to the point where

227
00:10:46,150 --> 00:10:43,750
one of the major research efforts

228
00:10:48,470 --> 00:10:46,160
involves using full-scale wind tunnels

229
00:10:50,230 --> 00:10:48,480
and other facilities to improve crop

230
00:10:52,389 --> 00:10:50,240
dusting aircraft

231
00:10:54,790 --> 00:10:52,399
studies of house spraying is affected in

232
00:10:57,350 --> 00:10:54,800
the wake behind the airplane handling

233
00:11:03,269 --> 00:10:57,360
qualities fuel efficiency and overall

234
00:11:07,430 --> 00:11:05,269
see those vertical fins on the wingtips

235
00:11:09,430 --> 00:11:07,440
of this small business jet

236
00:11:11,670 --> 00:11:09,440
those are called winglets and they were

237
00:11:14,150 --> 00:11:11,680
invented by dr richard t whitcomb of

238
00:11:16,230 --> 00:11:14,160

nasa's langley research center what the

239
00:11:18,310 --> 00:11:16,240
winglets do is reduce the drag on the

240
00:11:20,470 --> 00:11:18,320
plane as it moves through the air saving

241
00:11:22,630 --> 00:11:20,480
fuel in the process

242
00:11:25,110 --> 00:11:22,640
just about any plane can benefit from

243
00:11:27,269 --> 00:11:25,120
the largest jet cargo tankers to small

244
00:11:33,590 --> 00:11:27,279
cross-country planes like this one made

245
00:11:37,509 --> 00:11:35,509
again and again engineering research

246
00:11:40,470 --> 00:11:37,519
pilot jim patton forces his single

247
00:11:42,550 --> 00:11:40,480
engine plane into a stall spin

248
00:11:44,310 --> 00:11:42,560
what he and the data gathering engineers

249
00:11:46,630 --> 00:11:44,320
on the ground are trying to do is

250
00:11:48,790 --> 00:11:46,640
improve the design for wings and tail

251
00:11:51,110 --> 00:11:48,800
sections of airplanes to make them more

252
00:11:53,110 --> 00:11:51,120
resistant to stall spins

253
00:11:55,269 --> 00:11:53,120
this type problem accounts for about 30

254
00:11:58,630 --> 00:11:55,279
percent of crash fatalities in small

255
00:12:03,509 --> 00:12:01,350
combinations of wind tunnels simulators

256
00:12:05,990 --> 00:12:03,519
radio controlled model flights and

257
00:12:09,509 --> 00:12:06,000
full-scale tests are used to gather the

258
00:12:15,269 --> 00:12:12,949
this is an experimental xv15 tilt rotor

259
00:12:17,990 --> 00:12:15,279
aircraft being put through its paces in

260
00:12:19,910 --> 00:12:18,000
the 40 by 80 foot wind tunnel at nasa's

261
00:12:21,829 --> 00:12:19,920
ames research center

262
00:12:23,829 --> 00:12:21,839
the plane's engines are designed to tilt

263
00:12:26,230 --> 00:12:23,839

from vertical to horizontal in mid

264
00:12:28,550 --> 00:12:26,240
flight making it possible for the craft

265
00:12:30,790 --> 00:12:28,560
to take off hover and land like a

266
00:12:33,829 --> 00:12:30,800
helicopter and it can cruise at the

267
00:12:35,670 --> 00:12:33,839
speed of a fast subsonic airplane

268
00:12:38,230 --> 00:12:35,680
this research is an attempt to develop

269
00:12:40,870 --> 00:12:38,240
more economical short-haul intercity

270
00:12:42,790 --> 00:12:40,880
transportation

271
00:12:46,230 --> 00:12:42,800
at ames they are also flying this

272
00:12:48,949 --> 00:12:46,240
experimental jet called the qsra meaning

273
00:12:50,790 --> 00:12:48,959
quiet short-haul research aircraft a

274
00:12:52,710 --> 00:12:50,800
plane that can operate at lower noise

275
00:12:55,910 --> 00:12:52,720
levels than most of today's small

276
00:12:59,110 --> 00:12:55,920
aircraft carry the same payload as a 727

277
00:13:02,310 --> 00:12:59,120
jet and be able to land on a runway as

278
00:13:04,550 --> 00:13:02,320
short as 1500 feet

279
00:13:06,389 --> 00:13:04,560
at the lewis research center engineers

280
00:13:08,310 --> 00:13:06,399
are working to reduce noise and air

281
00:13:10,629 --> 00:13:08,320
pollution on aircraft engines that will

282
00:13:13,829 --> 00:13:10,639
one day be used for short-haul commuter

283
00:13:15,829 --> 00:13:13,839
type planes aircraft in the 300 to 500

284
00:13:19,030 --> 00:13:15,839
mile range was customarily land at

285
00:13:23,110 --> 00:13:20,470
to move ahead in research and

286
00:13:25,829 --> 00:13:23,120
development and plan the aircraft of 15

287
00:13:27,910 --> 00:13:25,839
to 20 years from now nasa's dryden

288
00:13:30,550 --> 00:13:27,920

flight research center in california has

289
00:13:32,710 --> 00:13:30,560
been test flying the yf-12

290
00:13:35,190 --> 00:13:32,720
an airplane that cruises at three times

291
00:13:38,150 --> 00:13:35,200
the speed of sound being studied are

292
00:13:40,550 --> 00:13:38,160
heating flight stability and control and

293
00:13:42,230 --> 00:13:40,560
structural dynamics all factors that

294
00:13:45,990 --> 00:13:42,240
have great impact on the design and

295
00:13:50,470 --> 00:13:48,710
there were two anniversaries in 1978

296
00:13:53,190 --> 00:13:50,480
that need to be noted

297
00:13:55,430 --> 00:13:53,200
75 years ago orville and wilbur wright

298
00:13:56,870 --> 00:13:55,440
made the first successful powered flight

299
00:13:59,269 --> 00:13:56,880
in an airplane

300
00:14:01,910 --> 00:13:59,279
it was also just 20 years ago that the

301
00:14:03,750 --> 00:14:01,920
space program officially began an

302
00:14:07,389 --> 00:14:03,760
extension of the basic wright brothers

303
00:14:25,990 --> 00:14:10,550
1978 a year of progress in both

304
00:14:30,310 --> 00:14:27,910
this special report brought to you by