



1
00:00:08,299 --> 00:00:05,180
the hydrogen and the oxygen levels are

2
00:00:10,160 --> 00:00:08,309
staying in their replenish boat this was

3
00:00:12,650 --> 00:00:10,170
the matter of their amazing a space

4
00:00:15,020 --> 00:00:12,660
shuttle it was also the year of a

5
00:00:18,200 --> 00:00:15,030
picture-taking unmanned Voyager to

6
00:00:20,480 --> 00:00:18,210
Saturn and in aeronautics it was the

7
00:00:28,800 --> 00:00:20,490
year to begin major flight tests of

8
00:00:34,810 --> 00:00:32,679
as astronauts John Young and Robert

9
00:00:36,880 --> 00:00:34,820
Crippen headed for the launch pad they

10
00:00:38,410 --> 00:00:36,890
represented more than being the pilots

11
00:00:41,470 --> 00:00:38,420
of this country's first space shuttle

12
00:00:43,570 --> 00:00:41,480
flight they represented years of hard

13
00:01:08,920 --> 00:00:43,580

work by thousands of people and

14

00:01:12,520 --> 00:01:08,930

businesses both large and small what's

15

00:01:14,520 --> 00:01:12,530

the Columbia's maiden flight was brief

16

00:01:18,190 --> 00:01:14,530

cost fifty four and a half hours

17

00:01:20,320 --> 00:01:18,200

thirty-six orbits we return to Earth but

18

00:01:59,969 --> 00:01:20,330

it signaled the beginning of a reusable

19

00:02:11,860 --> 00:02:02,680

astronauts Joanne go and get food clue

20

00:02:14,230 --> 00:02:11,870

columbia into space again while an

21

00:02:16,810 --> 00:02:14,240

imaging radar system mapped the stamp

22

00:02:19,750 --> 00:02:16,820

earth the crew made a critical test of a

23

00:02:22,449 --> 00:02:19,760

canadian developed mechanical arm giving

24

00:02:25,600 --> 00:02:22,459

you list to post payloads into and out

25

00:02:27,220 --> 00:02:25,610

of orbit on future flights even though

26

00:02:29,530 --> 00:02:27,230

the second mission is shortened from

27

00:02:31,750 --> 00:02:29,540

five days to two days because of a fuel

28

00:02:47,000 --> 00:02:31,760

cell problem the crew managed to carry

29

00:02:52,619 --> 00:02:50,130

as Columbia landed the second time the

30

00:03:11,809 --> 00:02:52,629

circle was complete a new generation of

31

00:03:14,880 --> 00:03:11,819

space travel had begun looking ahead to

32

00:03:17,250 --> 00:03:14,890

1983 and beyond NASA's Marshall Space

33

00:03:20,699 --> 00:03:17,260

Flight Center began training space lab

34

00:03:22,649 --> 00:03:20,709

crews when placed inside the cargo bay

35

00:03:24,539 --> 00:03:22,659

of the shuttle orbiter Space Lab

36

00:03:26,699 --> 00:03:24,549

converts the shuttle into a research

37

00:03:29,190 --> 00:03:26,709

center that will be used by scientists

38

00:03:30,869 --> 00:03:29,200

from around the world planned our

39

00:03:33,530 --> 00:03:30,879

experiments in communications and

40

00:03:36,000 --> 00:03:33,540

weather forecasting crop surveys

41

00:03:39,780 --> 00:03:36,010

manufacturing astronomy and life

42

00:03:41,369 --> 00:03:39,790

sciences a mobile workstation a concept

43

00:03:43,649 --> 00:03:41,379

developed by NASA's Langley Research

44

00:03:47,520 --> 00:03:43,659

Center was tested underwater at

45

00:03:49,710 --> 00:03:47,530

marshalls neutral buoyancy facility the

46

00:03:52,500 --> 00:03:49,720

mobile workstation may be used by future

47

00:03:55,349 --> 00:03:52,510

astronauts to construct large platforms

48

00:03:58,140 --> 00:03:55,359

or antennas in Earth orbit it allows a

49

00:04:00,180 --> 00:03:58,150

pair of pressure suited astronauts to

50

00:04:02,369 --> 00:04:00,190

move horizontally and vertically and

51
00:04:04,650 --> 00:04:02,379
build systems that are too large or

52
00:04:08,909 --> 00:04:04,660
complex to fold up and transport aboard

53
00:04:11,339 --> 00:04:08,919
the shuttle as Columbia took its place

54
00:04:14,490 --> 00:04:11,349
in the history books a small unmanned

55
00:04:17,430 --> 00:04:14,500
spacecraft voyager 2 made its mark a

56
00:04:19,529 --> 00:04:17,440
billion miles from Earth voyager 2

57
00:04:22,400 --> 00:04:19,539
approached and passed by the planet

58
00:04:25,260 --> 00:04:22,410
Saturn and its 17 fascinating moons

59
00:04:27,600 --> 00:04:25,270
taking thousands of pictures and making

60
00:04:28,879 --> 00:04:27,610
detailed scientific measurements as it

61
00:04:31,820 --> 00:04:28,889
went

62
00:04:34,459 --> 00:04:31,830
those music like sounds occurred as tiny

63
00:04:38,290 --> 00:04:34,469

particles hit and bounced off Voyager

64

00:04:41,089 --> 00:04:38,300

tues plasma wave detector antenna

65

00:04:43,459 --> 00:04:41,099

Saturn's vast ring system is made up of

66

00:04:46,459 --> 00:04:43,469

many small particles that orbit the huge

67

00:04:49,070 --> 00:04:46,469

planet in wave-like patterns one

68

00:04:51,110 --> 00:04:49,080

instrument on board Voyager 2 actually

69

00:04:53,749 --> 00:04:51,120

measured the thickness of Saturn's rings

70

00:04:56,659 --> 00:04:53,759

and found that the edge of the main ring

71

00:04:59,959 --> 00:04:56,669

system is remarkably thin less than 500

72

00:05:02,659 --> 00:04:59,969

feet thick its atmosphere is dominated

73

00:05:06,249 --> 00:05:02,669

by a strong equatorial jet stream that

74

00:05:08,540 --> 00:05:06,259

blows eastward at 1,200 miles per hour

75

00:05:11,149 --> 00:05:08,550

those storm systems are something like

76
00:05:13,219 --> 00:05:11,159
hurricanes here on earth and other means

77
00:05:15,589 --> 00:05:13,229
by which the internal heat energy of

78
00:05:20,209 --> 00:05:15,599
Saturn may feed the high-speed jet

79
00:05:23,029 --> 00:05:20,219
streams themselves as Voyager swept by

80
00:05:25,850 --> 00:05:23,039
it detected hot gases surrounding Saturn

81
00:05:28,939 --> 00:05:25,860
that are 600 million 2 1,000,000,000

82
00:05:33,260 --> 00:05:28,949
degrees Fahrenheit the hottest gases

83
00:05:35,839 --> 00:05:33,270
ever observed in the solar system for

84
00:05:38,119 --> 00:05:35,849
the Voyager team's years of analysis lie

85
00:05:40,429 --> 00:05:38,129
ahead in the meantime the small

86
00:05:42,140 --> 00:05:40,439
spacecraft will be watched and guided

87
00:05:47,800 --> 00:05:42,150
toward its rendezvous with the planet

88
00:05:50,240 --> 00:05:47,810

Uranus in 1986 and Neptune in 1989

89

00:05:52,129 --> 00:05:50,250

preparations continued at NASA's Jet

90

00:05:54,800 --> 00:05:52,139

Propulsion Laboratory and in the

91

00:05:57,800 --> 00:05:54,810

Netherlands to make ready iris the

92

00:06:00,980 --> 00:05:57,810

infrared astronomy satella now scheduled

93

00:06:03,170 --> 00:06:00,990

for launch in 1982 iris will make a

94

00:06:05,480 --> 00:06:03,180

comprehensive survey of the entire sky

95

00:06:08,439 --> 00:06:05,490

mapping possibly a million

96

00:06:11,390 --> 00:06:08,449

for rent sources many previously unknown

97

00:06:13,700 --> 00:06:11,400

the results are important because most

98

00:06:15,920 --> 00:06:13,710

infrared light from the stars and other

99

00:06:20,330 --> 00:06:15,930

cosmic sources is blocked out by the

100

00:06:22,610 --> 00:06:20,340

Earth's atmosphere scientists have been

101
00:06:24,920 --> 00:06:22,620
studying the planet Venus for years and

102
00:06:26,990 --> 00:06:24,930
a large number of them recently met in

103
00:06:29,540 --> 00:06:27,000
an international conference to compare

104
00:06:32,120 --> 00:06:29,550
their new findings apparently there are

105
00:06:34,490 --> 00:06:32,130
two major volcanic regions on the thick

106
00:06:37,279 --> 00:06:34,500
crusted Venus that serve as escape

107
00:06:40,370 --> 00:06:37,289
valves for the planets seething internal

108
00:06:42,920 --> 00:06:40,380
heat Venus clouds are upside down and

109
00:06:45,110 --> 00:06:42,930
are made up of a smog layer and a layer

110
00:06:48,499 --> 00:06:45,120
of sulfuric acid droplets that produce

111
00:06:50,420 --> 00:06:48,509
drizzle but seldom hard rain during its

112
00:06:52,640 --> 00:06:50,430
early history Venus may have been

113
00:06:57,350 --> 00:06:52,650

earth-like with cooler temperatures and

114

00:07:00,350 --> 00:06:57,360

an ocean when the Space Telescope is

115

00:07:02,450 --> 00:07:00,360

launched and begins operating in 1985 it

116

00:07:04,339 --> 00:07:02,460

will send electronic data to a newly

117

00:07:07,719 --> 00:07:04,349

established Space Telescope Science

118

00:07:10,100 --> 00:07:07,729

Institute at Johns Hopkins University

119

00:07:12,499 --> 00:07:10,110

the Space Telescope will provide

120

00:07:15,920 --> 00:07:12,509

astronomers with 24-hour views of the

121

00:07:18,830 --> 00:07:15,930

sky of unprecedented clarity this

122

00:07:21,560 --> 00:07:18,840

specially outfitted c-141 the kuiper

123

00:07:23,270 --> 00:07:21,570

airborne observatory is operated by

124

00:07:26,089 --> 00:07:23,280

NASA's Ames Research Center in

125

00:07:28,310 --> 00:07:26,099

California the kuiper Observatory

126

00:07:30,800 --> 00:07:28,320

routinely takes astronomers and their

127

00:07:33,529 --> 00:07:30,810

instruments to altitudes above most of

128

00:07:35,629 --> 00:07:33,539

the Earth's distorting atmosphere from

129

00:07:40,070 --> 00:07:35,639

there they can examine distant galaxies

130

00:07:42,110 --> 00:07:40,080

and study their vast energy some of

131

00:07:44,629 --> 00:07:42,120

NASA's high-flying picture takers look

132

00:07:45,719 --> 00:07:44,639

down rather than up down at the earth

133

00:07:48,390 --> 00:07:45,729

that is

134

00:07:50,879 --> 00:07:48,400

the high-altitude u2 aircraft is a good

135

00:07:53,670 --> 00:07:50,889

example in addition to aerial mapping

136

00:07:55,890 --> 00:07:53,680

cameras these planes carry air sampling

137

00:07:58,799 --> 00:07:55,900

devices to study the protective ozone

138

00:08:00,899 --> 00:07:58,809

layer in our atmosphere they are also

139

00:08:03,329 --> 00:08:00,909

helping to locate new water sources

140

00:08:07,980 --> 00:08:03,339

assess flood damage and fight forest

141

00:08:11,219 --> 00:08:07,990

fires to Landsat satellites continue to

142

00:08:14,489 --> 00:08:11,229

orbit the Earth 14 times a day from

143

00:08:17,129 --> 00:08:14,499

their 570 mile high vantage point they

144

00:08:20,999 --> 00:08:17,139

return images like these taken over rich

145

00:08:23,999 --> 00:08:21,009

California farmlands telltale red images

146

00:08:26,159 --> 00:08:24,009

indicate vigorous vegetation growth the

147

00:08:28,320 --> 00:08:26,169

state of California is using Landsat

148

00:08:33,149 --> 00:08:28,330

imagery to inventory and map its

149

00:08:35,670 --> 00:08:33,159

irrigated cropland not all of NASA's

150

00:08:38,730 --> 00:08:35,680

research has application to airplanes or

151

00:08:42,180 --> 00:08:38,740

spacecraft sometimes that situation is

152

00:08:43,620 --> 00:08:42,190

reversed on a little-used runway within

153

00:08:46,470 --> 00:08:43,630

sight of where the space shuttle

154

00:08:48,150 --> 00:08:46,480

Columbia already landed twice engineers

155

00:08:50,970 --> 00:08:48,160

are studying how to make tractor

156

00:08:54,420 --> 00:08:50,980

trailers and weekend motorhomes more

157

00:08:56,730 --> 00:08:54,430

fuel efficient using known aerodynamic

158

00:09:00,030 --> 00:08:56,740

techniques the corners and underbody of

159

00:09:02,670 --> 00:09:00,040

this van were rounded result seventy

160

00:09:05,280 --> 00:09:02,680

percent lower drag with a 30-percent

161

00:09:07,490 --> 00:09:05,290

fuel savings just by reducing the air

162

00:09:10,110 --> 00:09:07,500

resistance as the van traveled along

163

00:09:12,420 --> 00:09:10,120

these encouraging results may help

164

00:09:17,009 --> 00:09:12,430

change the shape of many vehicles in the

165

00:09:19,769 --> 00:09:17,019

future this car can be driven thousands

166

00:09:23,100 --> 00:09:19,779

of miles without ever moving only the

167

00:09:24,480 --> 00:09:23,110

wheels spin to simulate driving it is

168

00:09:26,250 --> 00:09:24,490

part of a program that the Jet

169

00:09:28,410 --> 00:09:26,260

Propulsion Laboratory has been involved

170

00:09:31,860 --> 00:09:28,420

in for the Department of Energy since

171

00:09:34,350 --> 00:09:31,870

the late 1970s the research is aimed at

172

00:09:36,660 --> 00:09:34,360

making electric powered cars competitive

173

00:09:39,140 --> 00:09:36,670

with those we now use for our regular

174

00:09:41,690 --> 00:09:39,150

shopping or commuting around town

175

00:09:43,730 --> 00:09:41,700

much of the activity this past year

176

00:09:45,980 --> 00:09:43,740

focused on finding batteries that will

177

00:09:51,230 --> 00:09:45,990

last longer and have an operating range

178

00:09:53,540 --> 00:09:51,240

of 75 to 100 miles per day since May

179

00:09:54,920 --> 00:09:53,550

residents of the Pacific Northwest have

180

00:09:58,220 --> 00:09:54,930

been receiving some of their electricity

181

00:10:00,110 --> 00:09:58,230

from an old power source gathered here

182

00:10:04,190 --> 00:10:00,120

at good no Hills Washington by the

183

00:10:06,320 --> 00:10:04,200

largest wind turbines in the world 350

184

00:10:08,060 --> 00:10:06,330

feet tall with blades the length of a

185

00:10:10,310 --> 00:10:08,070

football field the three

186

00:10:13,160 --> 00:10:10,320

computer-controlled turbines represent

187

00:10:15,530 --> 00:10:13,170

the first wind farm a cluster of wind

188

00:10:18,890 --> 00:10:15,540

generators working together to act as a

189

00:10:20,570 --> 00:10:18,900

single power source built as part of the

190

00:10:23,300 --> 00:10:20,580

Department of Energy's federal wind

191

00:10:25,280 --> 00:10:23,310

energy program the trio of wind turbines

192

00:10:27,770 --> 00:10:25,290

are managed by the Lewis Research Center

193

00:10:30,050 --> 00:10:27,780

and provides seven and a half million

194

00:10:32,270 --> 00:10:30,060

watts of electricity to the Bonneville

195

00:10:37,490 --> 00:10:32,280

Power Administration enough to power

196

00:10:39,800 --> 00:10:37,500

nearly 2,000 of the area's homes NASA

197

00:10:42,530 --> 00:10:39,810

launch satellites for a variety of users

198

00:10:44,420 --> 00:10:42,540

including a new comstar communication

199

00:10:48,290 --> 00:10:44,430

satellite for the COMSAT general

200

00:10:49,730 --> 00:10:48,300

corporation also launched was the second

201
00:10:52,760 --> 00:10:49,740
in a series of improved weather

202
00:10:55,660 --> 00:10:52,770
satellites those five for the National

203
00:11:00,140 --> 00:10:55,670
Oceanic and Atmospheric Administration

204
00:11:02,600 --> 00:11:00,150
in aeronautics the NASA Army xB 15

205
00:11:04,940 --> 00:11:02,610
children an experimental vertical

206
00:11:07,070 --> 00:11:04,950
takeoff and landing aircraft completed

207
00:11:10,460 --> 00:11:07,080
proof-of-concept flight tests at the

208
00:11:12,410 --> 00:11:10,470
Ames Research Center a pair of 25-foot

209
00:11:14,870 --> 00:11:12,420
propellers mounted on engines at each

210
00:11:17,900 --> 00:11:14,880
wingtip enabled the tiltrotor to take

211
00:11:19,940 --> 00:11:17,910
off and land like a helicopter once in

212
00:11:22,550 --> 00:11:19,950
the air the engines are rotated forward

213
00:11:25,790 --> 00:11:22,560

and the XV 15 becomes an airplane

214

00:11:27,410 --> 00:11:25,800

capable of flying at speeds up to 350

215

00:11:30,110 --> 00:11:27,420

miles per hour

216

00:11:33,800 --> 00:11:30,120

a tilt rotor speed and comfort would

217

00:11:35,930 --> 00:11:33,810

make it an ideal intercity transport it

218

00:11:37,910 --> 00:11:35,940

could also be the most economical way to

219

00:11:40,460 --> 00:11:37,920

serve as oil rigs more than a hundred

220

00:11:42,410 --> 00:11:40,470

miles from shore and because of its

221

00:11:44,720 --> 00:11:42,420

speed and endurance the tiltrotor could

222

00:11:46,940 --> 00:11:44,730

be used to carry out long-range rescue

223

00:11:49,160 --> 00:11:46,950

operations searching for three and a

224

00:11:53,690 --> 00:11:49,170

half hours then flying survivors to a

225

00:11:56,090 --> 00:11:53,700

hospital 200 miles away another plane

226

00:12:00,320 --> 00:11:56,100

the quiet short-haul research aircraft

227

00:12:03,380 --> 00:12:00,330

or q s ra performs exceptionally well in

228

00:12:05,450 --> 00:12:03,390

short takeoff and landing operations by

229

00:12:08,360 --> 00:12:05,460

directing its own exhaust over the

230

00:12:10,310 --> 00:12:08,370

plains upper wing the q sra is able to

231

00:12:13,640 --> 00:12:10,320

improve its short takeoff and landing

232

00:12:15,860 --> 00:12:13,650

performance the cue sras simple but

233

00:12:17,840 --> 00:12:15,870

versatile systems permit a wide variety

234

00:12:20,270 --> 00:12:17,850

of flight investigations that are

235

00:12:24,860 --> 00:12:20,280

providing important data to the american

236

00:12:27,320 --> 00:12:24,870

aerospace industry following a hard

237

00:12:30,560 --> 00:12:27,330

landing from 12 feet it was decided not

238

00:12:33,500 --> 00:12:30,570

to repair the x 14 be vertical takeoff

239

00:12:35,690 --> 00:12:33,510

and landing airplane the X 14 B is

240

00:12:38,090 --> 00:12:35,700

really a very sophisticated electronic

241

00:12:40,460 --> 00:12:38,100

flying simulator and has been used as a

242

00:12:44,570 --> 00:12:40,470

research tool it aims for the past 20

243

00:12:47,390 --> 00:12:44,580

years the largest wind tunnel in the

244

00:12:51,110 --> 00:12:47,400

world with a test section of 40 x 80

245

00:12:53,090 --> 00:12:51,120

feet is being made even larger six new

246

00:12:54,710 --> 00:12:53,100

twenty two thousand five hundred horse

247

00:12:57,400 --> 00:12:54,720

powered drive motors are shown here

248

00:13:00,200 --> 00:12:57,410

being installed in the Ames facility

249

00:13:03,830 --> 00:13:00,210

when complete the improvements will add

250

00:13:05,690 --> 00:13:03,840

an 80 x 120 foot Test section capable of

251
00:13:08,480 --> 00:13:05,700
handling full-scale aircraft with

252
00:13:10,850 --> 00:13:08,490
engines running it will also increase

253
00:13:14,800 --> 00:13:10,860
the air flow in the existing 40 x 80

254
00:13:17,420 --> 00:13:14,810
foot test section by 115 miles per hour

255
00:13:22,090 --> 00:13:17,430
this busy wind tunnel has been operating

256
00:13:26,390 --> 00:13:24,590
although this prototype propeller will

257
00:13:28,490 --> 00:13:26,400
never help pull an airplane through the

258
00:13:31,550 --> 00:13:28,500
air it may very well be the forerunner

259
00:13:33,950 --> 00:13:31,560
of ones that may attend bladed high

260
00:13:36,640 --> 00:13:33,960
speed turboprop was tested in a wind

261
00:13:39,500 --> 00:13:36,650
tunnel at the Lewis Research Center in

262
00:13:41,420 --> 00:13:39,510
the quiet fuel-efficient propellers were

263
00:13:47,540 --> 00:13:41,430

also flight tested at the Dryden

264

00:13:56,710 --> 00:13:47,550

facility in California from the

265

00:14:07,040 --> 00:14:04,640

to the flyby of the planet Saturn 1981

266

00:14:24,640 --> 00:14:07,050

was a busy and productive year for NASA

267

00:14:29,270 --> 00:14:27,110

this special report brought to you by