



1  
00:01:02,410 --> 00:00:19,880  
Americans referred to fades of Discovery

2  
00:01:08,300 --> 00:01:06,050  
this is Saturn five the rocket that will

3  
00:01:11,900 --> 00:01:08,310  
send three Americans toward the moon in

4  
00:01:13,850 --> 00:01:11,910  
project Apollo but this historic journey

5  
00:01:17,630 --> 00:01:13,860  
cannot be attempted without knowledge

6  
00:01:20,420 --> 00:01:17,640  
knowledge based on experience for the

7  
00:01:23,990 --> 00:01:20,430  
United States experience came by seeking

8  
00:01:25,910 --> 00:01:24,000  
answers to certain basic questions could

9  
00:01:29,660 --> 00:01:25,920  
a human being withstand an eight-day

10  
00:01:31,779 --> 00:01:29,670  
flight to the moon and back could a man

11  
00:01:34,010 --> 00:01:31,789  
control the movements of his spacecraft

12  
00:01:37,219 --> 00:01:34,020  
rendezvous and dock with another vehicle

13  
00:01:39,230 --> 00:01:37,229

orbiting the moon could he leave the

14

00:01:43,580 --> 00:01:39,240

protective cover of his spacecraft and

15

00:01:45,529 --> 00:01:43,590

perform useful work in space could he

16

00:01:47,779 --> 00:01:45,539

function effectively as an experimenter

17

00:01:52,080 --> 00:01:47,789

and use spaceflight to advance human

18

00:01:56,940 --> 00:01:54,719

could the Apollo spacecraft be guided

19

00:01:59,010 --> 00:01:56,950

and controlled during re-entry into the

20

00:02:08,900 --> 00:01:59,020

Earth's atmosphere so it could make

21

00:02:14,120 --> 00:02:11,270

if the answer to any of these questions

22

00:02:16,100 --> 00:02:14,130

was no it had to be known before three

23

00:02:20,870 --> 00:02:16,110

men travel a quarter of a million miles

24

00:02:23,540 --> 00:02:20,880

to the moon and so in 1961 the Gemini

25

00:02:27,290 --> 00:02:23,550

program came into being as the necessary

26

00:03:09,710 --> 00:02:27,300

prelude to Apollo this is the story of

27

00:03:17,430 --> 00:03:13,500

on Germany training began on earth and

28

00:03:19,530 --> 00:03:17,440

in the atmosphere this specially

29

00:03:21,930 --> 00:03:19,540

designed airplane was flown hundreds of

30

00:03:24,360 --> 00:03:21,940

times on parabolic sweeps into the sky

31

00:03:29,300 --> 00:03:24,370

to provide the Gemini astronauts with

32

00:03:33,960 --> 00:03:31,860

here's seconds at a time the

33

00:03:43,350 --> 00:03:33,970

difficulties of living in space were

34

00:03:45,540 --> 00:03:43,360

rehearsed working under zero gravity the

35

00:03:47,610 --> 00:03:45,550

Gemini astronauts gained experience with

36

00:03:50,370 --> 00:03:47,620

the equipment and techniques they would

37

00:03:51,900 --> 00:03:50,380

soon take into space it took hours of

38

00:03:54,510 --> 00:03:51,910

training under these rigorous conditions

39

00:04:01,800 --> 00:03:54,520

to develop the confidence needed for

40

00:04:11,160 --> 00:04:03,870

the Gemini astronauts took their

41

00:04:12,840 --> 00:04:11,170

equipment underwater balanced between

42

00:04:14,910 --> 00:04:12,850

sinking and rising

43

00:04:16,860 --> 00:04:14,920

they learned to pace themselves as they

44

00:04:18,690 --> 00:04:16,870

perform tasks in a condition that

45

00:04:33,060 --> 00:04:18,700

simulated longer periods of

46

00:04:38,140 --> 00:04:36,160

in the translation and docking simulator

47

00:04:40,270 --> 00:04:38,150

they got the feel of maneuvering their

48

00:04:59,189 --> 00:04:40,280

spacecraft into position for docking

49

00:05:04,409 --> 00:05:02,129

in the German emissions simulator they

50

00:05:07,260 --> 00:05:04,419

flew entire missions without leaving the

51  
00:05:09,959 --> 00:05:07,270  
ground here they learn to react quickly

52  
00:05:18,460 --> 00:05:09,969  
and correctly to problems fed to them

53  
00:05:26,260 --> 00:05:21,110  
the Gemini astronauts exposed themselves

54  
00:05:31,130 --> 00:05:29,420  
they trained for emergencies learning

55  
00:05:33,430 --> 00:05:31,140  
how to react if things did not go

56  
00:05:35,630 --> 00:05:33,440  
exactly according to plan

57  
00:05:45,700 --> 00:05:35,640  
parachute training in case they were

58  
00:05:45,710 --> 00:05:53,920  
water survival for landings in the ocean

59  
00:05:53,930 --> 00:06:06,640  
survival in desert and jungle

60  
00:06:13,219 --> 00:06:09,499  
but ultimately there was no substitute

61  
00:06:20,589 --> 00:06:13,229  
for being there Germany took the men and

62  
00:06:28,189 --> 00:06:24,679  
the 18 months between March 1965 and

63  
00:06:31,879 --> 00:06:28,199

November 1966 ten manned missions were

64

00:06:33,769 --> 00:06:31,889

launched from Cape Kennedy sixteen

65

00:06:40,960 --> 00:06:33,779

astronauts journey to their spacecraft

66

00:06:46,700 --> 00:06:43,460

Virgil Grissom and John Young were first

67

00:06:49,550 --> 00:06:46,710

then James McDivitt and Edward white L

68

00:06:51,890 --> 00:06:49,560

Gordon Cooper and Charles Conrad Frank

69

00:06:54,980 --> 00:06:51,900

Borman and James Lovell Walter schirra

70

00:06:57,530 --> 00:06:54,990

Thomas Stafford Neil Armstrong David

71

00:07:01,490 --> 00:06:57,540

Scott Eugene Cernan and Michael Collins

72

00:07:03,640 --> 00:07:01,500

Richard Gordon Edwin Albert four of the

73

00:07:06,590 --> 00:07:03,650

Gemini astronauts made the trip twice

74

00:07:08,510 --> 00:07:06,600

together these men helped thrust the

75

00:07:16,990 --> 00:07:08,520

United States into a new era of

76

00:07:22,670 --> 00:07:20,180

Gemini was a single concept with a

77

00:07:35,020 --> 00:07:22,680

number of assignments it was in a sense

78

00:07:58,909 --> 00:07:41,240

five four tickets countdown dance all

79

00:08:53,050 --> 00:08:46,439

ow

80

00:08:55,300 --> 00:08:53,060

exploration in their voyages into this

81

00:08:59,009 --> 00:08:55,310

environment the Gemini astronauts logged

82

00:09:01,449 --> 00:08:59,019

more than 1940 man hours of flight

83

00:09:03,879 --> 00:09:01,459

hurtling through space at five miles a

84

00:09:09,309 --> 00:09:03,889

second they circled the earth six

85

00:09:11,799 --> 00:09:09,319

hundred times in their forty birthdays

86

00:09:14,439 --> 00:09:11,809

in space they witnessed as few men have

87

00:09:31,440 --> 00:09:14,449

hundreds of sunsets on the changing

88

00:09:35,880 --> 00:09:33,600

sweeping over continents in a matter of

89

00:09:51,600 --> 00:09:35,890

minutes they gained a new perspective of

90

00:09:53,460 --> 00:09:51,610

earth for Gemini equipment and

91

00:09:55,410 --> 00:09:53,470

techniques were developed that enabled

92

00:09:57,810 --> 00:09:55,420

astronauts for the first time to

93

00:10:09,860 --> 00:09:57,820

maneuver their spacecraft to change

94

00:10:15,390 --> 00:10:12,750

the first Gemini maneuvers were basic

95

00:10:30,330 --> 00:10:15,400

flying formation with the spent second

96

00:10:31,380 --> 00:10:30,340

stage of the Titan to rocket then a more

97

00:10:33,840 --> 00:10:31,390

difficult step

98

00:10:49,920 --> 00:10:33,850

rendezvous finding and approaching

99

00:10:51,840 --> 00:10:49,930

another craft in space the first target

100

00:10:55,200 --> 00:10:51,850

for Monday who was another manned

101  
00:11:01,110 --> 00:10:55,210  
spacecraft Gemini 6 approached within

102  
00:11:05,270 --> 00:11:01,120  
one foot of Gemini 7 rendezvous a major

103  
00:11:08,370 --> 00:11:05,280  
landmark in the history of manned flight

104  
00:11:10,320 --> 00:11:08,380  
aboard Gemini 7 astronaut Foreman

105  
00:11:12,990 --> 00:11:10,330  
prepares to take motion pictures of

106  
00:11:23,320 --> 00:11:13,000  
Germany 6 as the two spacecraft begin

107  
00:11:28,370 --> 00:11:25,820  
10 rendezvous were accomplished during

108  
00:11:30,260 --> 00:11:28,380  
the Gemini program the techniques varied

109  
00:11:33,140 --> 00:11:30,270  
for this maneuver is important to

110  
00:11:34,760 --> 00:11:33,150  
project Apollo the lunar module on

111  
00:11:37,490 --> 00:11:34,770  
returning from the surface of the Moon

112  
00:11:39,950 --> 00:11:37,500  
must rendezvous and dock with the

113  
00:11:42,470 --> 00:11:39,960

command and service module in Gemini

114

00:11:44,900 --> 00:11:42,480

conditions of lunar orbit were simulated

115

00:11:58,970 --> 00:11:44,910

in Earth orbit and confidence for Apollo

116

00:12:03,740 --> 00:12:01,520

on four of the Gemini missions the

117

00:12:06,590 --> 00:12:03,750

rendezvous target was the Agena space

118

00:12:08,900 --> 00:12:06,600

vehicle during the program the Gemini

119

00:12:10,760 --> 00:12:08,910

astronauts located and docked with the

120

00:12:13,610 --> 00:12:10,770

Agena x' nine times

121

00:12:17,750 --> 00:12:13,620

developing experience and confidence in

122

00:12:20,000 --> 00:12:17,760

this important maneuver this experience

123

00:12:22,160 --> 00:12:20,010

is vital to the lunar mission where the

124

00:12:24,020 --> 00:12:22,170

Apollo astronauts will dock twice on

125

00:12:33,830 --> 00:12:24,030

their journey from the earth to the moon

126

00:12:38,420 --> 00:12:36,770

as the spacecraft moved in docking

127

00:12:41,030 --> 00:12:38,430

lights aboard the vehicle helped guide

128

00:13:00,470 --> 00:12:41,040

the pilot during the final stages of the

129

00:13:03,650 --> 00:13:00,480

manoeuvre but not everything always went

130

00:13:06,430 --> 00:13:03,660

according to plan on Gemini 8 a thruster

131

00:13:08,720 --> 00:13:06,440

failed causing excessive yaw and roll

132

00:13:15,100 --> 00:13:08,730

unable to find the source of trouble

133

00:13:19,900 --> 00:13:17,440

the roll rate accelerated reaching an

134

00:13:23,080 --> 00:13:19,910

alarming one revolution for second but

135

00:13:25,420 --> 00:13:23,090

Armstrong fought and won his struggle to

136

00:13:35,170 --> 00:13:25,430

regain control and he brought Gemini 8

137

00:13:37,180 --> 00:13:35,180

to a safe landing on Gemini 9 when an

138

00:13:39,820 --> 00:13:37,190

Atlas rocket failed to place the Agena

139

00:13:42,100 --> 00:13:39,830

into orbit a substitute docking target

140

00:13:43,900 --> 00:13:42,110

was launched trouble developed on the

141

00:13:46,090 --> 00:13:43,910

new target when its shroud failed to

142

00:13:56,970 --> 00:13:46,100

separate leaving what the astronauts

143

00:14:02,140 --> 00:13:59,290

although the docking maneuver had to be

144

00:14:03,940 --> 00:14:02,150

anceled the flight plan was revised so

145

00:14:05,830 --> 00:14:03,950

the astronauts could go on to practice

146

00:14:07,810 --> 00:14:05,840

rendezvous two more times

147

00:14:10,750 --> 00:14:07,820

developing faith and their ability to

148

00:14:27,050 --> 00:14:10,760

cope with adversity and to learn from

149

00:14:32,730 --> 00:14:30,210

on two missions the Gemini astronauts

150

00:14:39,470 --> 00:14:32,740

actually assembled a new spacecraft in

151  
00:14:49,980 --> 00:14:42,210  
after docking they commanded the Agena

152  
00:14:52,080 --> 00:14:49,990  
to restart its own rocket engine on one

153  
00:14:57,560 --> 00:14:52,090  
mission this space build vehicle was

154  
00:15:02,520 --> 00:15:00,270  
from their vantage point in space the

155  
00:15:16,199 --> 00:15:02,530  
astronauts had a spectacular view of our

156  
00:15:21,100 --> 00:15:18,579  
although flight experience was the

157  
00:15:23,319 --> 00:15:21,110  
primary objective of Germany the program

158  
00:15:26,470 --> 00:15:23,329  
offered a unique space laboratory to

159  
00:15:29,019 --> 00:15:26,480  
science medicine and technology more

160  
00:15:30,220 --> 00:15:29,029  
than 50 experiments were carried on the

161  
00:15:38,210 --> 00:15:30,230  
Germany spacecraft

162  
00:15:43,730 --> 00:15:40,700  
one experiment was photography of the

163  
00:15:56,090 --> 00:15:43,740

earth masked areas never seen by man in

164

00:16:00,840 --> 00:15:58,830

more than two thousand photographs were

165

00:16:03,570 --> 00:16:00,850

taken from space during the Gemini

166

00:16:05,040 --> 00:16:03,580

program these pictures are being used to

167

00:16:07,020 --> 00:16:05,050

correct maps and to provide

168

00:16:09,090 --> 00:16:07,030

oceanographers geologists and

169

00:16:31,300 --> 00:16:09,100

geographers with new information about

170

00:16:36,009 --> 00:16:33,610

the Gemini astronauts also use their

171

00:16:38,619 --> 00:16:36,019

cameras to photograph cloud patterns and

172

00:16:40,480 --> 00:16:38,629

other atmospheric phenomena this works

173

00:16:51,040 --> 00:16:40,490

supplemented information obtained from

174

00:16:56,389 --> 00:16:53,749

hundreds of high-resolution photographs

175

00:17:03,050 --> 00:16:56,399

were made to provide new knowledge about

176

00:17:07,610 --> 00:17:05,210

the astronomical science is also

177

00:17:09,740 --> 00:17:07,620

benefited from Germany for the orbiting

178

00:17:11,750 --> 00:17:09,750

spacecraft enables scientists to send

179

00:17:14,000 --> 00:17:11,760

instruments far above the blanket of

180

00:17:20,170 --> 00:17:14,010

atmosphere which filters and obscures a

181

00:17:25,850 --> 00:17:23,870

on Gemini 12 an eclipse of the Sun was

182

00:17:30,140 --> 00:17:25,860

photographed for the first time from

183

00:17:34,100 --> 00:17:31,970

the results of scientific research

184

00:17:36,680 --> 00:17:34,110

conducted on Gemini have been made

185

00:17:39,049 --> 00:17:36,690

available to the world not only helping

186

00:17:41,870 --> 00:17:39,059

to advance man's knowledge but promoting

187

00:17:47,020 --> 00:17:41,880

a greater measure of understanding among

188

00:17:51,280 --> 00:17:49,210

three of the man Yemeni missions were

189

00:17:54,400 --> 00:17:51,290

flown to investigate the problems of

190

00:17:56,020 --> 00:17:54,410

long-duration spaceflight Yemeni four

191

00:17:59,860 --> 00:17:56,030

was a four-day mission

192

00:18:02,710 --> 00:17:59,870

Germany five eight days on gemenese

193

00:18:23,289 --> 00:18:02,720

seven astronauts Lovell and Borman spent

194

00:18:29,060 --> 00:18:25,970

these flights confirm the endurance of

195

00:18:30,620 --> 00:18:29,070

man and his new spacecraft systems they

196

00:18:32,720 --> 00:18:30,630

showed that an astronaut can live in

197

00:18:35,299 --> 00:18:32,730

space longer than is required for a

198

00:18:45,610 --> 00:18:35,309

round trip to the moon and thus paved

199

00:18:50,450 --> 00:18:48,440

using the Agena space vehicle the

200

00:18:52,669 --> 00:18:50,460

astronauts also experimented with a new

201  
00:18:55,000 --> 00:18:52,679  
technique for holding their spacecrafts

202  
00:18:57,830 --> 00:18:55,010  
attitude fixed with respect to the earth

203  
00:19:11,870 --> 00:18:57,840  
normally this requires the continuous

204  
00:19:13,909 --> 00:19:11,880  
use of fuel but on two missions a day

205  
00:19:26,779 --> 00:19:13,919  
chrome tether was attached between the

206  
00:19:31,560 --> 00:19:29,310  
slightly nearer the earth was pulled

207  
00:19:34,590 --> 00:19:31,570  
more strongly by gravity than what the

208  
00:19:36,960 --> 00:19:34,600  
spacecraft this small difference was

209  
00:19:38,609 --> 00:19:36,970  
enough to stabilise the vehicles so they

210  
00:19:42,600 --> 00:19:38,619  
could maintain their position without

211  
00:19:51,409 --> 00:19:42,610  
use of fuel this technique has important

212  
00:19:56,129 --> 00:19:53,999  
perhaps the most spectacular experiment

213  
00:19:58,350 --> 00:19:56,139

of the Gemini program was extra

214

00:20:04,970 --> 00:19:58,360

vehicular activity astronaut ed white

215

00:20:09,870 --> 00:20:07,800

spruts of gas from whites handheld

216

00:20:17,370 --> 00:20:09,880

maneuvering device thrust him in the

217

00:20:19,590 --> 00:20:17,380

desired direction floating object in the

218

00:20:40,830 --> 00:20:19,600

foreground is the astronauts over glove

219

00:20:43,020 --> 00:20:40,840

left behind in the spacecraft in

220

00:20:45,540 --> 00:20:43,030

contrast to ed white successful

221

00:20:47,520 --> 00:20:45,550

20-minute walk in space the next three

222

00:20:49,970 --> 00:20:47,530

men to venture outside their spacecraft

223

00:20:51,930 --> 00:20:49,980

encountered unexpected difficulties

224

00:20:53,700 --> 00:20:51,940

although some useful work was

225

00:20:56,160 --> 00:20:53,710

accomplished including on one mission

226

00:20:58,080 --> 00:20:56,170

the historic retrieval of a scientific

227

00:21:00,510 --> 00:20:58,090

experiment left behind on an earlier

228

00:21:03,270 --> 00:21:00,520

flight workloads were higher than

229

00:21:05,190 --> 00:21:03,280

anticipated the astronauts had trouble

230

00:21:07,830 --> 00:21:05,200

stabilizing themselves outside the

231

00:21:24,969 --> 00:21:07,840

spacecraft all three walks had to be

232

00:21:29,119 --> 00:21:26,840

difficulties encountered on these

233

00:21:45,700 --> 00:21:29,129

missions posed profound problems for

234

00:21:51,440 --> 00:21:48,920

so another more careful and more tightly

235

00:21:55,970 --> 00:21:51,450

controlled test was prepared for Gemini

236

00:21:58,610 --> 00:21:55,980

12 the last flight in the program higher

237

00:22:00,980 --> 00:21:58,620

to this flight astronaut Aldrin trained

238

00:22:18,920 --> 00:22:00,990

intensively under water pacing himself

239

00:22:20,660 --> 00:22:18,930

for his work in space the tasks assigned

240

00:22:22,430 --> 00:22:20,670

to him were designed to compare the

241

00:22:24,620 --> 00:22:22,440

difficulty of working in a weightless

242

00:22:32,720 --> 00:22:24,630

environment with work under normal

243

00:22:38,840 --> 00:22:36,620

on jeongeun's well the problem of excess

244

00:22:41,000 --> 00:22:38,850

workload was overcome by frequent rest

245

00:22:43,550 --> 00:22:41,010

periods and the use of improved body

246

00:22:53,560 --> 00:22:43,560

positioning restraints such as waist

247

00:22:59,030 --> 00:22:56,330

extra vehicular activity has important

248

00:23:01,010 --> 00:22:59,040

applications to the lunar mission Apollo

249

00:23:03,440 --> 00:23:01,020

astronauts will leave their vehicle and

250

00:23:06,110 --> 00:23:03,450

install scientific equipment and collect

251  
00:23:08,330 --> 00:23:06,120  
samples on the surface of the Moon this

252  
00:23:10,880 --> 00:23:08,340  
requires experience working in pressure

253  
00:23:19,360 --> 00:23:10,890  
suits and performing tasks in the near

254  
00:23:25,250 --> 00:23:22,880  
the success of EBA during Gemini will

255  
00:23:27,080 --> 00:23:25,260  
also give Apollo astronauts returning

256  
00:23:29,960 --> 00:23:27,090  
from the lunar surface the ability to

257  
00:23:42,180 --> 00:23:29,970  
board their command module even if they

258  
00:23:47,130 --> 00:23:44,860  
jiminee provided more than 12 hours of

259  
00:23:50,110 --> 00:23:47,140  
experience in extra vehicular activity

260  
00:23:53,830 --> 00:23:50,120  
the training the caution the slow

261  
00:24:01,680 --> 00:23:53,840  
accumulation of facts paid off man can

262  
00:24:06,549 --> 00:24:04,330  
on all German emissions a major

263  
00:24:08,769 --> 00:24:06,559

objective was to develop re-entry flight

264

00:24:10,570 --> 00:24:08,779

paths and landing control so the

265

00:24:12,940 --> 00:24:10,580

spacecraft could land at a specific

266

00:24:14,529 --> 00:24:12,950

place on earth this required the

267

00:24:16,659 --> 00:24:14,539

development of new techniques for

268

00:24:20,019 --> 00:24:16,669

guiding and controlling the reentry of

269

00:24:22,299 --> 00:24:20,029

the spacecraft this is the view from the

270

00:24:26,310 --> 00:24:22,309

spacecraft window as Germany we entered

271

00:24:30,610 --> 00:24:28,990

glowing particles boiled off the

272

00:24:36,690 --> 00:24:30,620

protective heat shield to leave an

273

00:24:41,740 --> 00:24:40,000

during Gemini 10 man's spacecraft made

274

00:24:42,760 --> 00:24:41,750

this fiery re-entry into the Earth's

275

00:24:47,470 --> 00:24:42,770

atmosphere

276

00:24:51,250 --> 00:24:47,480

Germany 12 was the last its reentry in

277

00:24:54,880 --> 00:24:51,260

November 1966 climaxed a program which

278

00:25:07,190 --> 00:24:54,890

will really have no end for Germany is

279

00:25:12,630 --> 00:25:10,260

our first importance is the fact that

280

00:25:16,049 --> 00:25:12,640

gemense sent more men into space and

281

00:25:17,700 --> 00:25:16,059

kept them there longer Germany

282

00:25:28,350 --> 00:25:17,710

multiplied American manned spaceflight

283

00:25:28,360 --> 00:25:33,790

we've got you on the boom to feel good

284

00:25:38,920 --> 00:25:36,820

Gemelli an open program helped further

285

00:25:41,650 --> 00:25:38,930

promote international cooperation and

286

00:25:44,230 --> 00:25:41,660

space people in other nations not only

287

00:25:45,640 --> 00:25:44,240

witness Germany as it happened but also

288

00:25:48,280 --> 00:25:45,650

helped accomplish the program's

289

00:25:50,470 --> 00:25:48,290

objectives showing again the necessity

290

00:26:08,320 --> 00:25:50,480

for international cooperation in the

291

00:26:13,639 --> 00:26:11,180

Gemini also leaves as its legacy a

292

00:26:16,129 --> 00:26:13,649

greatly expanded science and technology

293

00:26:18,259 --> 00:26:16,139

proof that government industry and the

294

00:26:21,230 --> 00:26:18,269

scientific community can work together

295

00:26:39,400 --> 00:26:21,240

to translate man's boldest dreams into

296

00:26:43,270 --> 00:26:41,140

in the front ranks of the bearers of

297

00:26:50,710 --> 00:26:43,280

Germany's legacy are the astronauts

298

00:27:04,019 --> 00:26:53,720

these veterans are now ready to face the

299

00:27:09,850 --> 00:27:06,970

Apollo with its new questions new

300

00:27:16,450 --> 00:27:09,860

problems and longer more difficult

301

00:27:21,100 --> 00:27:16,460

voyages what after gem knee one question