1
00:01:06,390 --> 00:01:03,990
microgravity

2
00:01:09,670 --> 00:01:06,400
it offers the promise of new techniques

3
00:01:12,550 --> 00:01:09,680
and new technologies in pharmaceuticals

4
00:01:14,789 --> 00:01:12,560
materials manufacturing

5
00:01:17,270 --> 00:01:14,799
and microgravity studies are a key

6
00:01:19,190 --> 00:01:17,280
component of fundamental research on the

7
00:01:22,870 --> 00:01:19,200
shuttle today

8
00:01:25,350 --> 00:01:22,880
but vibrations from shuttle maneuvers

9
00:01:27,670 --> 00:01:25,360
operating equipment even movement of the

10
00:01:29,830 --> 00:01:27,680
crew within the cabin can mimic the

11
00:01:31,910 --> 00:01:29,840
effects of gravity

12
00:01:34,069 --> 00:01:31,920
experiments set up to take advantage of

13
00:01:37,270 --> 00:01:34,079

a weightless environment are subtly

14
00:01:39,190 --> 00:01:37,280
affected yet when researchers know the

15
00:01:40,390 --> 00:01:39,200
strength and frequency of these

16
00:01:43,030 --> 00:01:40,400
vibrations

17
00:01:45,429 --> 00:01:43,040
they can determine and account for the

18
00:01:47,590 --> 00:01:45,439
forces acting on these microgravity

19
00:01:49,830 --> 00:01:47,600
experiment samples

20
00:01:52,630 --> 00:01:49,840
the space acceleration measurement

21
00:01:55,749 --> 00:01:52,640
system or sams developed by the lewis

22
00:01:57,990 --> 00:01:55,759
research center measures conditions and

23
00:02:00,469 --> 00:01:58,000
records forces of low gravity

24
00:02:02,789 --> 00:02:00,479
accelerations on the shuttle

25
00:02:05,749 --> 00:02:02,799
from the united states and international

26
00:02:08,630 --> 00:02:05,759
microgravity missions to the space lab

27
00:02:11,750 --> 00:02:08,640
life science series sams has provided

28
00:02:14,150 --> 00:02:11,760
vital information on shuttle experiments

29
00:02:16,150 --> 00:02:14,160
this information guides scientists to a

30
00:02:18,470 --> 00:02:16,160
better understanding of the effects of

31
00:02:20,630 --> 00:02:18,480
microgravity accelerations on these

32
00:02:22,390 --> 00:02:20,640
experiments

33
00:02:24,790 --> 00:02:22,400
the sams hardware

34
00:02:27,830 --> 00:02:24,800
consists of a main signal processing

35
00:02:29,110 --> 00:02:27,840
unit and three remote tri-axial sensor

36
00:02:31,990 --> 00:02:29,120
heads

37
00:02:33,270 --> 00:02:32,000
by mounting a sam sensor head on or near

38
00:02:35,030 --> 00:02:33,280

an experiment

39
00:02:38,229 --> 00:02:35,040
the accelerations affecting the

40
00:02:40,630 --> 00:02:38,239
experiment can be sampled directly

41
00:02:43,110 --> 00:02:40,640
the triaxial sensor heads detect

42
00:02:44,470 --> 00:02:43,120
accelerations along three orthogonal

43
00:02:47,509 --> 00:02:44,480
axes

44
00:02:49,430 --> 00:02:47,519
these inertial sensors measure positive

45
00:02:52,630 --> 00:02:49,440
and negative accelerations over a

46
00:02:54,790 --> 00:02:52,640
specified frequency range

47
00:02:56,710 --> 00:02:54,800
sams has provided researchers with

48
00:02:59,990 --> 00:02:56,720
measurements of these accelerations

49
00:03:03,910 --> 00:03:00,000
since its first flight in june of 1991

50
00:03:06,149 --> 00:03:03,920
aboard sts-40 the space lab life science

51
00:03:08,790 --> 00:03:06,159
series 1 mission

52
00:03:11,190 --> 00:03:08,800
since that first mission the unit has

53
00:03:13,270 --> 00:03:11,200
flown in a variety of locations

54
00:03:16,309 --> 00:03:13,280
including both the space lab center

55
00:03:19,509 --> 00:03:16,319
aisle and its mid-deck experiment rack

56
00:03:21,350 --> 00:03:19,519
the shuttle's mid deck the space hab and

57
00:03:22,710 --> 00:03:21,360
the cargo bay

58
00:03:25,030 --> 00:03:22,720
to accommodate the different

59
00:03:27,830 --> 00:03:25,040
environments of these locations

60
00:03:29,509 --> 00:03:27,840
sams offers three configurations to

61
00:03:31,110 --> 00:03:29,519
researchers

62
00:03:32,390 --> 00:03:31,120
in the spacehab center aisle

63
00:03:34,710 --> 00:03:32,400

configuration

64
00:03:37,270 --> 00:03:34,720
the sams unit allows the flight crew

65
00:03:40,390 --> 00:03:37,280
access to the optical disks which they

66
00:03:43,430 --> 00:03:40,400
can periodically rotate or exchange to

67
00:03:45,990 --> 00:03:43,440
provide unlimited data recording

68
00:03:48,789 --> 00:03:46,000
also accessible are the control switches

69
00:03:50,949 --> 00:03:48,799
and indicators of the main unit located

70
00:03:53,589 --> 00:03:50,959
on the front panel

71
00:03:56,630 --> 00:03:53,599
in the mid deck configuration the unit

72
00:03:58,949 --> 00:03:56,640
is mounted either in a smidex rack or in

73
00:04:01,429 --> 00:03:58,959
place of a stowage locker

74
00:04:03,270 --> 00:04:01,439
it is fastened to a bulkhead by a

75
00:04:05,030 --> 00:04:03,280
mounting plate the mission office

76
00:04:07,350 --> 00:04:05,040
provides

77
00:04:09,509 --> 00:04:07,360
disks and controls are accessible

78
00:04:11,910 --> 00:04:09,519
throughout the mission

79
00:04:14,630 --> 00:04:11,920
the tri-axial sensor heads are mounted

80
00:04:16,390 --> 00:04:14,640
either prior to launch or by the flight

81
00:04:18,550 --> 00:04:16,400
crew once in orbit

82
00:04:21,110 --> 00:04:18,560
flight crew members can place the sensor

83
00:04:22,550 --> 00:04:21,120
heads at predetermined locations to

84
00:04:24,469 --> 00:04:22,560
accommodate the needs of the

85
00:04:26,710 --> 00:04:24,479
experimenter

86
00:04:29,030 --> 00:04:26,720
the sensor heads can be mounted directly

87
00:04:31,670 --> 00:04:29,040
on the experiment or

88
00:04:33,670 --> 00:04:31,680

up to a maximum distance of 20 feet from

89
00:04:35,990 --> 00:04:33,680
the main unit

90
00:04:38,070 --> 00:04:36,000
the sensor head cables can be easily

91
00:04:39,510 --> 00:04:38,080
connected to the rear right side of the

92
00:04:40,870 --> 00:04:39,520
main unit in the center aisle

93
00:04:43,430 --> 00:04:40,880
configuration

94
00:04:46,550 --> 00:04:43,440
and to the unit's face plate when at

95
00:04:52,629 --> 00:04:49,350
the last configuration for the sams unit

96
00:04:55,189 --> 00:04:52,639
is known as m-pass for mission peculiar

97
00:04:58,230 --> 00:04:55,199
experiments support structure

98
00:05:01,110 --> 00:04:58,240
here the unit is placed in the cargo bay

99
00:05:04,310 --> 00:05:01,120
inaccessible to the flight crew

100
00:05:07,029 --> 00:05:04,320
the mpes main control unit and data

101
00:05:10,070 --> 00:05:07,039
storage unit are safely enclosed for

102
00:05:12,870 --> 00:05:10,080
operation in this harsh environment

103
00:05:16,790 --> 00:05:12,880
in this configuration the sams unit can

104
00:05:19,430 --> 00:05:16,800
retain 0.8 gigabytes of data

105
00:05:21,990 --> 00:05:19,440
raw data in this configuration can be

106
00:05:24,710 --> 00:05:22,000
downlinked to the payload operations

107
00:05:26,710 --> 00:05:24,720
control center or poc

108
00:05:29,510 --> 00:05:26,720
this provides researchers with the

109
00:05:31,749 --> 00:05:29,520
opportunity to monitor and analyze data

110
00:05:34,390 --> 00:05:31,759
displays in a time frame which

111
00:05:37,749 --> 00:05:34,400
approaches real time

112
00:05:40,629 --> 00:05:37,759
three switches power data record and

113
00:05:42,070 --> 00:05:40,639

disk change are located on the control

114
00:05:45,590 --> 00:05:42,080
panel

115
00:05:48,469 --> 00:05:45,600
five indicator lights or leds are also

116
00:05:51,909 --> 00:05:48,479
located on the control panel

117
00:05:54,550 --> 00:05:51,919
the leds are designed to confirm basic

118
00:05:56,950 --> 00:05:54,560
operating functions of the sams unit

119
00:05:58,950 --> 00:05:56,960
additionally they will indicate certain

120
00:06:00,550 --> 00:05:58,960
failures of the sams unit should they

121
00:06:03,510 --> 00:06:00,560
occur

122
00:06:06,790 --> 00:06:03,520
during normal operations the tri-color

123
00:06:08,870 --> 00:06:06,800
leds on the recording drive will pulsate

124
00:06:11,110 --> 00:06:08,880
from yellow to red

125
00:06:14,309 --> 00:06:11,120
yellow indicates that the optical disk

126
00:06:16,629 --> 00:06:14,319
is spinning in the disk drive while red

127
00:06:20,710 --> 00:06:16,639
indicates that the drive is reading from

128
00:06:24,150 --> 00:06:20,720
or writing to the optical disk

129
00:06:26,870 --> 00:06:24,160
this concludes module one the background

130
00:06:39,189 --> 00:06:26,880
and system familiarization of the space

131
00:06:42,150 --> 00:06:40,550
in this module

132
00:06:44,870 --> 00:06:42,160
we will demonstrate the nominal

133
00:06:47,590 --> 00:06:44,880
operations of the sams unit

134
00:06:49,350 --> 00:06:47,600
first you need to unstow the optical

135
00:06:51,909 --> 00:06:49,360
discs

136
00:06:54,950 --> 00:06:51,919
rotate the door screws counterclockwise

137
00:06:57,589 --> 00:06:54,960
to open the drive doors

138
00:06:59,990 --> 00:06:57,599

next rotate the disc ejection levers

139
00:07:03,350 --> 00:07:00,000
counterclockwise

140
00:07:05,510 --> 00:07:03,360
stow the dummy discs and unstow two

141
00:07:12,550 --> 00:07:05,520
blank discs

142
00:07:14,830 --> 00:07:12,560
into drives one and two

143
00:07:16,629 --> 00:07:14,840
making sure that the discs lock into

144
00:07:19,110 --> 00:07:16,639
place

145
00:07:20,550 --> 00:07:19,120
then rotate the disc ejection lever

146
00:07:22,790 --> 00:07:20,560
clockwise

147
00:07:29,189 --> 00:07:22,800
until they are pointing up with respect

148
00:07:33,670 --> 00:07:32,390
to activate the sams unit turn the power

149
00:07:35,830 --> 00:07:33,680
on

150
00:07:37,589 --> 00:07:35,840
verify that the power indicator light is

151
00:07:40,870 --> 00:07:37,599
green

152
00:07:43,350 --> 00:07:40,880
record the mission elapsed time

153
00:07:45,670 --> 00:07:43,360
the drive one full light and the drive

154
00:07:47,430 --> 00:07:45,680
to full light should be lit during

155
00:07:52,150 --> 00:07:47,440
initialization

156
00:07:54,150 --> 00:07:52,160
process to be completed

157
00:07:57,029 --> 00:07:54,160
after the initialization process is

158
00:07:59,029 --> 00:07:57,039
complete and the drive one and drive two

159
00:08:02,070 --> 00:07:59,039
indicator lights are off

160
00:08:05,990 --> 00:08:02,080
notify the pot that the power is on and

161
00:08:10,869 --> 00:08:07,909
after allowing the unit to warm up for

162
00:08:14,950 --> 00:08:10,879
15 minutes you are now ready to operate

163
00:08:17,510 --> 00:08:14,960

sams first close the disk drive doors

164
00:08:19,510 --> 00:08:17,520
and rotate the screws clockwise to the

165
00:08:22,790 --> 00:08:19,520
lock position

166
00:08:25,830 --> 00:08:22,800
then turn the data record switch on

167
00:08:30,869 --> 00:08:25,840
verify that the data record light is on

168
00:08:35,829 --> 00:08:33,350
after three minutes verify that the

169
00:08:37,110 --> 00:08:35,839
drive one and drive to full lights are

170
00:08:39,509 --> 00:08:37,120
off

171
00:08:42,149 --> 00:08:39,519
notify the park that the sams unit is

172
00:08:51,990 --> 00:08:42,159
recording data and indicate the current

173
00:08:56,710 --> 00:08:54,630
before you rotate the disc in drive one

174
00:08:57,829 --> 00:08:56,720
check to see if the system error light

175
00:08:59,430 --> 00:08:57,839
is on

176
00:09:01,990 --> 00:08:59,440
this should not occur during normal

177
00:09:03,350 --> 00:09:02,000
operations but if it does consult the

178
00:09:05,990 --> 00:09:03,360
puck

179
00:09:12,710 --> 00:09:06,000
verify that the drive one full light is

180
00:09:17,190 --> 00:09:15,030
next rotate the drive door screws

181
00:09:18,870 --> 00:09:17,200
counterclockwise

182
00:09:21,350 --> 00:09:18,880
rotate the disc ejection lever

183
00:09:22,949 --> 00:09:21,360
counterclockwise to eject the disc from

184
00:09:25,590 --> 00:09:22,959
drive 1

185
00:09:30,070 --> 00:09:25,600
then log the mission elapsed time and

186
00:09:37,030 --> 00:09:33,030
insert the disk side b facing up into

187
00:09:39,590 --> 00:09:37,040
drive 1 until the disk locks into place

188
00:09:41,110 --> 00:09:39,600

rotate the disc ejection lever clockwise

189
00:09:43,190 --> 00:09:41,120
pointing up

190
00:09:45,110 --> 00:09:43,200
toggle the disc change switch

191
00:09:47,190 --> 00:09:45,120
momentarily

192
00:09:49,670 --> 00:09:47,200
after three minutes the drive one full

193
00:09:52,230 --> 00:09:49,680
light should turn off

194
00:09:54,070 --> 00:09:52,240
verify that the drive to full light is

195
00:09:56,630 --> 00:09:54,080
also off

196
00:10:00,070 --> 00:09:56,640
close the drive door and rotate the

197
00:10:02,710 --> 00:10:00,080
screws clockwise to the lock position

198
00:10:06,069 --> 00:10:02,720
notify the puck that you have completed

199
00:10:08,949 --> 00:10:06,079
disk rotation steps four through seven

200
00:10:10,949 --> 00:10:08,959
to rotate the optical disk in drive two

201
00:10:17,990 --> 00:10:10,959
simply repeat the procedure we just

202
00:10:22,949 --> 00:10:21,030
before exchanging the disc in drive one

203
00:10:24,949 --> 00:10:22,959
check to see that the drive one full

204
00:10:25,910 --> 00:10:24,959
light is on

205
00:10:27,829 --> 00:10:25,920
next

206
00:10:29,829 --> 00:10:27,839
rotate the drive door screws

207
00:10:32,949 --> 00:10:29,839
counterclockwise

208
00:10:36,550 --> 00:10:32,959
then eject the disk

209
00:10:39,829 --> 00:10:36,560
log the met and drive number on the disk

210
00:10:44,069 --> 00:10:42,870
stow the full disk and unstow a blank

211
00:10:49,670 --> 00:10:44,079
disk

212
00:10:51,269 --> 00:10:49,680
up into drive one until it locks into

213
00:10:56,150 --> 00:10:51,279

place

214
00:11:01,509 --> 00:10:58,829
press the disk change switch

215
00:11:05,110 --> 00:11:01,519
momentarily allow up to three minutes

216
00:11:07,269 --> 00:11:05,120
for the drive one full light to turn off

217
00:11:11,190 --> 00:11:07,279
then close the drive door

218
00:11:13,350 --> 00:11:11,200
and rotate the screws clockwise to lock

219
00:11:16,150 --> 00:11:13,360
notify the puck that you have completed

220
00:11:18,949 --> 00:11:16,160
replacing the disk in drive one

221
00:11:28,630 --> 00:11:18,959
to exchange the disk in drive two repeat

222
00:11:33,990 --> 00:11:31,750
to deactivate the sams unit turn off the

223
00:11:36,310 --> 00:11:34,000
data record switch

224
00:11:38,389 --> 00:11:36,320
wait two minutes and verify that the

225
00:11:40,870 --> 00:11:38,399
data light is off

226
00:11:42,870 --> 00:11:40,880
next turn the power switch off

227
00:11:45,509 --> 00:11:42,880
the power indicator light should

228
00:11:49,110 --> 00:11:47,430
to stow the discs

229
00:11:51,750 --> 00:11:49,120
turn the drive door screws

230
00:11:54,069 --> 00:11:51,760
counterclockwise

231
00:11:57,269 --> 00:11:54,079
now rotate the disc ejection levers

232
00:12:00,629 --> 00:11:57,279
counterclockwise to eject the disks

233
00:12:03,110 --> 00:12:00,639
log the met and drive number on the disk

234
00:12:08,150 --> 00:12:05,110
stow both disks

235
00:12:11,190 --> 00:12:08,160
unstow the two dummy disks and insert

236
00:12:14,550 --> 00:12:11,200
them into drive one and drive two

237
00:12:16,790 --> 00:12:14,560
making sure they lock into place

238
00:12:18,870 --> 00:12:16,800

turn the disc ejection levers to the

239
00:12:21,030 --> 00:12:18,880
lock position

240
00:12:23,509 --> 00:12:21,040
close the disk drive doors

241
00:12:36,150 --> 00:12:23,519
and rotate the screws clockwise so the

242
00:12:42,310 --> 00:12:38,790
to check the status of the sams unit

243
00:12:44,870 --> 00:12:42,320
turn the door screws counterclockwise

244
00:12:47,509 --> 00:12:44,880
at the specified intervals voice the

245
00:12:50,389 --> 00:12:47,519
status of the five control panel lights

246
00:12:52,470 --> 00:12:50,399
and the two disk drive lights

247
00:12:54,790 --> 00:12:52,480
close both drive doors

248
00:13:03,750 --> 00:12:54,800
and turn the screws clockwise to the

249
00:13:08,710 --> 00:13:05,750
alternate procedures for operation of

250
00:13:10,629 --> 00:13:08,720
the sams unit are utilized only when one

251
00:13:12,870 --> 00:13:10,639
drive has failed

252
00:13:14,949 --> 00:13:12,880
rotation and exchange of the optical

253
00:13:17,509 --> 00:13:14,959
disk is performed in the same manner

254
00:13:19,829 --> 00:13:17,519
demonstrated for nominal operation with

255
00:13:22,550 --> 00:13:19,839
one notable exception

256
00:13:25,350 --> 00:13:22,560
for single drive operation of sams the

257
00:13:28,550 --> 00:13:25,360
drive that is non-operational is put on

258
00:13:31,670 --> 00:13:28,560
standby for the duration of the mission

259
00:13:33,829 --> 00:13:31,680
also during rotation or exchange the

260
00:13:36,790 --> 00:13:33,839
recording of data on the operational

261
00:13:38,949 --> 00:13:36,800
drive is temporarily aborted in order to

262
00:13:40,629 --> 00:13:38,959
eject the disk without damage to the

263
00:13:42,069 --> 00:13:40,639

recorded data

264
00:13:44,550 --> 00:13:42,079
for example

265
00:13:46,870 --> 00:13:44,560
if disk drive 2 fails

266
00:13:49,430 --> 00:13:46,880
place it in the standby position by

267
00:13:51,430 --> 00:13:49,440
rotating the disc ejection lever to the

268
00:13:53,670 --> 00:13:51,440
nine o'clock position

269
00:13:56,470 --> 00:13:53,680
the lever should remain in this position

270
00:13:59,910 --> 00:13:56,480
for the duration of the mission

271
00:14:03,030 --> 00:13:59,920
then to temporarily abort drive one

272
00:14:04,870 --> 00:14:03,040
wait to the tri-color led flashes from

273
00:14:07,189 --> 00:14:04,880
red to yellow

274
00:14:10,230 --> 00:14:07,199
then turn the drive one disk ejection

275
00:14:13,030 --> 00:14:10,240
lever clockwise to the one o'clock or

276
00:14:16,470 --> 00:14:13,040
abort position

277
00:14:19,189 --> 00:14:16,480
this concludes module two the nominal

278
00:14:34,870 --> 00:14:19,199
and alternate procedures for the space

279
00:14:40,230 --> 00:14:37,590
in module 3 we will briefly review

280
00:14:41,750 --> 00:14:40,240
malfunctions of the sams unit and the

281
00:14:43,829 --> 00:14:41,760
procedures to follow should a

282
00:14:46,230 --> 00:14:43,839
malfunction occur

283
00:14:48,150 --> 00:14:46,240
if the power light does not illuminate

284
00:14:49,509 --> 00:14:48,160
when power is initially applied to the

285
00:14:52,550 --> 00:14:49,519
sams unit

286
00:14:54,949 --> 00:14:52,560
perform malfunction procedure 1.

287
00:14:56,870 --> 00:14:54,959
to determine the cause of this condition

288
00:15:00,230 --> 00:14:56,880

you would cycle the power

289
00:15:02,470 --> 00:15:00,240
and examine the status of certain leds

290
00:15:04,470 --> 00:15:02,480
the sams unit could be in one of three

291
00:15:06,870 --> 00:15:04,480
states

292
00:15:09,829 --> 00:15:06,880
the power light is transient

293
00:15:13,670 --> 00:15:09,839
the power light has failed or there has

294
00:15:15,590 --> 00:15:13,680
been a system power failure in the unit

295
00:15:18,710 --> 00:15:15,600
if the unit is in one of the first two

296
00:15:20,389 --> 00:15:18,720
conditions it can still be operational

297
00:15:23,110 --> 00:15:20,399
however if it is determined that the

298
00:15:25,509 --> 00:15:23,120
unit is in the third condition a power

299
00:15:27,590 --> 00:15:25,519
system failure then it would remain

300
00:15:35,590 --> 00:15:27,600
non-operational for the duration of the

301
00:15:41,269 --> 00:15:38,230
after powers applied to sams the

302
00:15:43,749 --> 00:15:41,279
initialization process begins

303
00:15:45,910 --> 00:15:43,759
nominally the drive full lights will

304
00:15:47,829 --> 00:15:45,920
illuminate to indicate the start of the

305
00:15:50,389 --> 00:15:47,839
initialization process

306
00:15:51,590 --> 00:15:50,399
and extinguish after the process is

307
00:15:53,829 --> 00:15:51,600
complete

308
00:15:56,069 --> 00:15:53,839
this takes about two minutes

309
00:15:59,749 --> 00:15:56,079
if after two minutes one or both of the

310
00:16:03,509 --> 00:15:59,759
dry full lights are on solid or blinking

311
00:16:05,749 --> 00:16:03,519
then perform malfunction procedure two

312
00:16:06,870 --> 00:16:05,759
if this happens one of the following has

313
00:16:09,430 --> 00:16:06,880

occurred

314
00:16:11,430 --> 00:16:09,440
a disc may not be seated properly

315
00:16:12,550 --> 00:16:11,440
reseeding the disc would eliminate the

316
00:16:14,790 --> 00:16:12,560
error

317
00:16:17,350 --> 00:16:14,800
the discs may be faulty

318
00:16:18,790 --> 00:16:17,360
rotating or exchanging them would solve

319
00:16:21,269 --> 00:16:18,800
the problem

320
00:16:22,790 --> 00:16:21,279
the unit may be recording on a single

321
00:16:25,509 --> 00:16:22,800
drive only

322
00:16:28,790 --> 00:16:25,519
if this occurs refer to the alternate

323
00:16:31,030 --> 00:16:28,800
procedures described in module 2.

324
00:16:33,509 --> 00:16:31,040
the system may have failed

325
00:16:37,990 --> 00:16:33,519
and again will be non-operational for

326
00:16:43,910 --> 00:16:40,550
following initialization of sams and a

327
00:16:46,389 --> 00:16:43,920
15-minute warm-up period the data record

328
00:16:49,030 --> 00:16:46,399
switch is ready to be enabled

329
00:16:51,110 --> 00:16:49,040
if the data record switch is thrown

330
00:16:52,230 --> 00:16:51,120
and the data record light does not

331
00:16:55,509 --> 00:16:52,240
illuminate

332
00:16:57,990 --> 00:16:55,519
perform malfunction procedure 3.

333
00:17:01,670 --> 00:16:58,000
one of three errors has occurred

334
00:17:04,870 --> 00:17:01,680
the data record switch is faulty

335
00:17:07,350 --> 00:17:04,880
the data record light could have failed

336
00:17:09,510 --> 00:17:07,360
there is an uncorrectable fault in which

337
00:17:16,710 --> 00:17:09,520
case the unit will be non-operational

338
00:17:22,150 --> 00:17:19,990

when one side of an optical disk is full

339
00:17:24,230 --> 00:17:22,160
the drive full light corresponding to

340
00:17:26,309 --> 00:17:24,240
that disk will illuminate

341
00:17:28,710 --> 00:17:26,319
the time it will take to fill one side

342
00:17:30,789 --> 00:17:28,720
of a disk is predetermined based on the

343
00:17:32,310 --> 00:17:30,799
frequencies of the tri-axial sensor

344
00:17:34,150 --> 00:17:32,320
heads

345
00:17:36,390 --> 00:17:34,160
if the drive full light does not

346
00:17:39,270 --> 00:17:36,400
illuminate as scheduled perform

347
00:17:41,190 --> 00:17:39,280
malfunction procedure 4.

348
00:17:43,590 --> 00:17:41,200
in this case the drive may have had a

349
00:17:46,630 --> 00:17:43,600
previous malfunction and has corrected

350
00:17:48,950 --> 00:17:46,640
itself thus becoming operational again

351
00:17:50,549 --> 00:17:48,960
it may also have prematurely quit

352
00:17:52,630 --> 00:17:50,559
recording on the drive that was

353
00:17:54,710 --> 00:17:52,640
scheduled to be full and is now

354
00:17:55,909 --> 00:17:54,720
recording on the other drive

355
00:17:58,070 --> 00:17:55,919
finally

356
00:18:00,390 --> 00:17:58,080
again there may have been a system

357
00:18:07,270 --> 00:18:00,400
malfunction that could possibly be

358
00:18:12,789 --> 00:18:10,150
following rotation or exchange of a full

359
00:18:14,390 --> 00:18:12,799
disk and the disk change switch having

360
00:18:16,390 --> 00:18:14,400
been toggled

361
00:18:18,549 --> 00:18:16,400
it will take up to three minutes for the

362
00:18:19,669 --> 00:18:18,559
corresponding drive full light to

363
00:18:21,750 --> 00:18:19,679

extinguish

364
00:18:24,470 --> 00:18:21,760
if after three minutes the corresponding

365
00:18:28,070 --> 00:18:24,480
drive full light fails to extinguish

366
00:18:29,909 --> 00:18:28,080
perform malfunction procedure five this

367
00:18:31,669 --> 00:18:29,919
could indicate that the disc is not

368
00:18:33,510 --> 00:18:31,679
seated properly and may have to be

369
00:18:35,669 --> 00:18:33,520
reseeded

370
00:18:38,630 --> 00:18:35,679
the disc may be faulty and may have to

371
00:18:41,029 --> 00:18:38,640
be rotated or exchanged

372
00:18:43,669 --> 00:18:41,039
there may also have been a disc drive

373
00:18:51,270 --> 00:18:43,679
failure in which case the alternate

374
00:18:56,549 --> 00:18:53,830
at any time during normal operation of

375
00:18:59,510 --> 00:18:56,559
sams or after any crew interface with

376
00:19:02,390 --> 00:18:59,520
sams one or both of the drive full

377
00:19:05,029 --> 00:19:02,400
lights may suddenly begin to blink

378
00:19:06,789 --> 00:19:05,039
if this happens perform malfunction

379
00:19:08,710 --> 00:19:06,799
procedure six

380
00:19:11,430 --> 00:19:08,720
this indicates that the corresponding

381
00:19:12,789 --> 00:19:11,440
drive has failed either temporarily or

382
00:19:14,789 --> 00:19:12,799
permanently

383
00:19:16,870 --> 00:19:14,799
if the drive has temporarily quit

384
00:19:19,590 --> 00:19:16,880
recording the malfunction can be

385
00:19:25,110 --> 00:19:19,600
corrected however the drives will now be

386
00:19:29,270 --> 00:19:27,190
the system error light is another

387
00:19:32,150 --> 00:19:29,280
indicator of a malfunction

388
00:19:34,549 --> 00:19:32,160

if this led should illuminate perform

389
00:19:36,630 --> 00:19:34,559
malfunction procedure 7.

390
00:19:39,190 --> 00:19:36,640
this indicates that there are 30 minutes

391
00:19:41,430 --> 00:19:39,200
or less of recording time available on

392
00:19:43,590 --> 00:19:41,440
both optical discs

393
00:19:46,789 --> 00:19:43,600
note that the system error light will

394
00:19:49,029 --> 00:19:46,799
not come on alone either one or both of

395
00:19:51,909 --> 00:19:49,039
the drive full lights will also be

396
00:19:54,390 --> 00:19:51,919
illuminated if only one drive full light

397
00:19:55,270 --> 00:19:54,400
is on the unit is still able to record

398
00:19:57,830 --> 00:19:55,280
data

399
00:20:00,630 --> 00:19:57,840
if both drive full lights are on the

400
00:20:09,270 --> 00:20:00,640
unit is not recording and valuable data

401
00:20:13,510 --> 00:20:11,110
when you are either rotating or

402
00:20:16,070 --> 00:20:13,520
exchanging an optical disc there is a

403
00:20:17,430 --> 00:20:16,080
possibility that the disc will not eject

404
00:20:19,270 --> 00:20:17,440
from the drive

405
00:20:21,750 --> 00:20:19,280
if this should happen perform

406
00:20:24,230 --> 00:20:21,760
malfunction procedure 8.

407
00:20:25,350 --> 00:20:24,240
the disc may not be seated properly in

408
00:20:27,190 --> 00:20:25,360
the drive

409
00:20:30,070 --> 00:20:27,200
reseat the disc

410
00:20:32,549 --> 00:20:30,080
if the disc will not eject at all

411
00:20:33,510 --> 00:20:32,559
use needle nose pliers to extract the

412
00:20:35,270 --> 00:20:33,520
disc

413
00:20:38,630 --> 00:20:35,280

if you cannot retrieve the disk with the

414
00:20:45,270 --> 00:20:38,640
pliers the disk has jammed or the disk

415
00:20:50,870 --> 00:20:48,390
during single drive operation the drive

416
00:20:53,029 --> 00:20:50,880
full lights may illuminate

417
00:20:54,789 --> 00:20:53,039
if this happens perform malfunction

418
00:20:56,789 --> 00:20:54,799
procedure nine

419
00:20:59,190 --> 00:20:56,799
this could indicate that the disc in the

420
00:21:01,350 --> 00:20:59,200
functioning drive is faulty

421
00:21:03,909 --> 00:21:01,360
it could also indicate that the

422
00:21:07,270 --> 00:21:03,919
previously faulty drive has corrected

423
00:21:08,870 --> 00:21:07,280
itself and is now functioning properly

424
00:21:11,590 --> 00:21:08,880
if this is the case

425
00:21:12,710 --> 00:21:11,600
the disk in the previously faulty drive

426
00:21:16,310 --> 00:21:12,720
is full

427
00:21:18,310 --> 00:21:16,320
and needs to be rotated or exchanged and

428
00:21:20,470 --> 00:21:18,320
the alternate procedures for single

429
00:21:22,470 --> 00:21:20,480
drive operation would no longer be

430
00:21:24,789 --> 00:21:22,480
necessary

431
00:21:27,430 --> 00:21:24,799
this concludes the third and final

432
00:21:29,830 --> 00:21:27,440
module of this video if you have any

433
00:21:33,110 --> 00:21:29,840
questions please review the appropriate