1.0 SUMMARY

The purpose of the Apollo 11 mission was to land men on the lunar surface and to return them safely to earth. The crew were Neil A. Armstrong, Commander; Michael Collins, Command Module Pilot; and Edwin E. Aldrin, Jr., Lunar Module Pilot.

The space vehicle was launched from Kennedy Space Center, Florida, at 8:32:00 a.m., e.s.t., July 16, 1969. The activities during earth orbit checkout, translunar injection, transposition and docking, spacecraft ejection, and translunar coast were similar to those of Apollo 10. Only one midcourse correction, performed at about 27 hours elapsed time, was required during translunar coast.

The spacecraft was inserted into lunar orbit at about 76 hours, and the circularization maneuver was performed two revolutions later. Initial checkout of lunar module systems was satisfactory, and after a planned rest period, the Commander and Lunar Module Pilot entered the lunar module to prepare for descent.

The two spacecraft were undocked at about 100 hours, followed by separation of the command and service modules from the lunar module. Descent orbit insertion was performed at approximately 101-1/2 hours, and powered descent to the lunar surface began about 1 hour later. Operation of the guidance and descent propulsion systems was nominal. The lunar module was maneuvered manually approximately 1100 feet downrange from the nominal landing point during the final 2-1/2 minutes of descent. The spacecraft landed in the Sea of Tranquillity at 102:45:40. The landing coordinates were 0 degrees 41 minutes 15 seconds north latitude and 23 degrees 26 minutes east longitude referenced to lunar map ORB-II-6(100), first edition, December 1967. During the first 2 hours on the surface, the two crewmen performed a postlanding checkout of all lunar module systems. Afterwards, they ate their first meal on the moon and elected to perform the surface operations earlier than planned.

Considerable time was deliberately devoted to checkout and donning of the back-mounted portable life support and oxygen purge systems. The Commander egressed through the forward hatch and deployed an equipment module in the descent stage. A camera in this module provided live television coverage of the Commander descending the ladder to the surface, with first contact made at 109:24:15 (9:56:15 p.m. e.s.t., July 20, 1969). The Lunar Module Pilot egressed soon thereafter, and both crewmen used the initial period on the surface to become acclimated to the reduced gravity and unfamiliar surface conditions. A contingency sample was taken from the surface, and the television camera was deployed so that most of the lunar module was included in its view field. The crew activated the scientific experiments, which included a solar wind detector, a passive

1.0 摘要

阿波罗11号任务的目的是将宇航员送上月球表面，并使他们安全返回地球。乘组成员为：尼尔·A·阿姆斯特朗，指挥官；迈克尔·柯林斯，指令舱驾驶员；以及小埃德温·E·奥尔德林，登月舱驾驶员。

航天器于1969年7月16日东部标准时间上午8:32:00从佛罗里达州肯尼迪航天中心发射升空。地球轨道检查、地月转移注入、转位与对接、航天器抽出以及地月转移滑行期间的活动与阿波罗10号类似。地月转移滑行期间只需进行一次中途修正，修正于任务经过时间约27小时进行。

航天器于任务经过时间约76小时进入月球轨道，并在两圈后实施圆化机动。登月舱系统的初步检查结果令人满意；按计划休息一段时间后，指挥官和登月舱驾驶员进入登月舱，为下降做准备。

两艘航天器于任务经过时间约100小时脱离对接，随后指令舱和服务舱与登月舱分离。约在任务经过时间101-1 / 2小时实施下降轨道注入，并于约1小时后开始动力下降至月球表面。制导系统和下降推进系统运行正常。在下降最后2-1 / 2分钟内，登月舱由人工操纵，沿航程方向偏离名义着陆点约1100英尺。航天器于102 : 45 : 40降落在静海。着陆坐标为北纬0度41分15秒、东经23度26分，坐标参照月球地图ORB - II - 6 (100)，1967年12月第一版。在着陆后的最初2小时内，两名乘组成员对登月舱的所有系统进行了着陆后检查。之后，他们在月球上吃了第一顿饭，并决定提前开展月面作业。

他们特意花费了相当多的时间检查并穿戴背负式便携生命保障系统和氧气净化系统。指挥官经由前舱门出舱，并在下降级上展开一个设备组件。该组件中的摄像机对指挥官沿梯子下到月面的过程进行了实时电视转播；首次接触月面时间为109 : 24 : 15（1969年7月20日东部标准时间晚上9:56:15）。登月舱驾驶员随后不久也出舱，两名乘组成员利用在月面的初始时段适应低重力和陌生的月面环境。他们从月面采集了一份应急样品，并架设电视摄像机，使其视野覆盖登月舱的大部分区域。乘组启动了科学实验设备，其中包括太阳风探测器、一种被动式

TABLE 3-I.- SEQUENCE OF EVENTS

Event	Time, hr:min:sec
Range zero - 13:32:00 G.m.t., July 16, 1969	
Lift-off	00:00:00.6
S-IC outboard engine cutoff	00:02:41.7
S-II engine ignition (command)	00:02:43.0
Launch escape tower jettison	00:03:17.9
S-II engine cutoff	00:09:08.3
S-IVB engine ignition (command)	00:09:12.2
S-IVB engine cutoff	00:11:39.3
Translunar injection maneuver	02:44:16.2*
Command and service module/S-IVB separation	03:17:04.6
First docking	03:24:03.1
Spacecraft ejection	04:16:59.1
Separation maneuver (from S-IVB)	04:40:01.8*
First midcourse correction	26:44:58.7*
Lunar orbit insertion	75:49:50.4*
Lunar orbit circularization	80:11:36.8*
Undocking	100:12:00
Separation maneuver (from lunar module)	100:39:52.9*
Descent orbit insertion	101:36:14*
Powered descent initiation	102:33:05.2*
Lunar landing	102:45:39.9
Egress (hatch opening)	109:07:33
Ingress (hatch closing)	111:39:13
Lunar lift-off	124:22:00.8*
Coelliptic sequence initiation	125:19:36*
Constant differential height maneuver	126:17:49.6*
Terminal phase initiation	127:03:51.8*

*Engine ignition time.

表 3-1——事件顺序

事件	时间， 时：分：秒
起始时刻——1969 年 7 月 16 日格林尼治标准时间 13:32:00	
发射	00:00:00.6
S - IC 外侧发动机关机	00:02:41.7
S - II 发动机点火（指令）	00:02:43.0
发射逃逸塔抛弃	00:03:17.9
S - II 发动机关机	00:09:08.3
S - IVB 发动机点火（指令）	00:09:12.2
S - IVB 发动机关机	00:11:39.3
地月转移注入机动	02:44:16.2*
指挥舱与服务舱 / S - IVB分离	03:17:04.6
首次对接	03:24:03.1
航天器弹出	04:16:59.1
分离机动（从S - IVB分离）	04:40:01.8*
首次中途修正	26:44:58.7*
月球轨道插入	75:49:50.4*
月球轨道圆化	80:11:36.8*
脱离对接	100:12:00
分离机动（从登月舱分离）	100:39:52.9*
下降轨道插入	101:36:14*
动力下降起始	102:33:05.2*
月球着陆	102:45:39.9
出舱（舱门开启）	109:07:33
进舱（舱门关闭）	111:39:13
月面起飞	124:22:00.8*
共椭圆序列起始	125:19:36*
恒定高度差机动	126:17:49.6*
终端阶段起始	127:03:51.8*

* 发动机点火时间 .