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

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.