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*APOLLO 7 SPACECRAFT OPERATIONAL TRAJECTORY (REVISION I) VOLUME I - MISSION PROFILE

By Alexie H. Benney, Jr., Samuel L. Miller,
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MISSION PLANNING AND ANALYSIS DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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PROJECT APOLLO

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APOLLO 7 SPACECRAFT OPERATIONAL TRAJECTORY (REVISION I)

VOLUME I - MISSION PROFILE

By Alexie H. Benney, Jr., Samuel L. Miller, and
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1.0 SUMMARY

This document defines the Apollo 7 spacecraft operational trajectory (revision 1), and is a complete revision of all the previously published spacecraft trajectory data. It is presented in three volumes. This volume, Volume I, describes the mission profile in detail and presents plots and tables of pertinent trajectory data. Volume II contains detailed data describing the trajectory profile. Volume III contains detailed tracking and aspect angle time history data for those stations supporting Apollo 7. The consumables analysis will be issued in a separate document.

2.0 INTRODUCTION

Apollo 7 will be the first manned Apollo mission and will demonstrate CSM operations and the capability of the spacecraft, crew, and MSFN support facilities to conduct an open-ended, earth orbital mission of up to 11 days duration. In addition to fundamental spacecraft checkout and crew operations, Apollo 7 will qualify the CSM forward heat shield (flat apex area), determine ECS radiator performance and the amount of coating degradation, verify proper deployment of the SLA panels, perform transposition and simulated docking, and evaluate CSM-active rendezvous activities.

The purpose of this document is to provide the latest Apollo 7 spacecraft operational trajectory and attitude environment data for evaluating the CSM systems in an open-ended, near earth orbital mission of up to 11 days duration. The trajectory profile and design is based on published input data that essentially includes the ASPO mission requirements or test objectives, the known spacecraft and launch vehicle constraints, the spacecraft mass, aerodynamic and performance properties, the ground support network and facilities, and the spacecraft guidance equations, programs, and logic.

Revision 1 to the spacecraft operational trajectory for Apollo 7 is published in three volumes. This volume, Volume I, describes the mission profile according to four periods of activities and presents pertinent plotted and tabulated trajectory data; the times of maneuvers discussed in Volume I are given as impulsive times since the external ΔV load is given to the onboard computer at the impulsive point.

Volume II (ref. 1) contains detailed digital time history data defining the spacecraft state vector, attitude, and performance. The attitude simulation is valid during all prethrust and thrusting maneuvers and the rendezvous periods. Volume III (ref. 2) contains detailed tracking and aspect angle digital time history data for the MSFN stations supporting Apollo 7. Revision 1 of the consumables analysis will be published about 1 month later.

For the nominal trajectory simulation, Apollo 7 is assumed to be launched at 1500 G.m.t., (1000 e.s.t.), September 20, 1968, from launch complex 34 on a flight azimuth of 72° from true north. The mission profile has been divided into four periods of activities.

The first period of activities extends from lift-off to $01^d02^h25^m$ g.e.t. and consists of the following events:

1. Launch.
2. Insertion into earth parking orbit.
3. Earth parking orbit coast.
4. Orbital safing of the S-IVB.
5. Transposition and simulated docking with the S-IVB.
6. SLA photography.
7. SM RCS phasing maneuver to set up conditions for rendezvous the next day.
8. CSM systems checkout.

The second period of activity lasts from $01^d02^h25^m$ to 03^d19^h g.e.t. and consists of a CSM-active rendezvous with the S-IVB, landmark tracking, and CSM systems tests.

The third period, from 03^d19^h to 10^d19^h g.e.t., consists of the following:

1. SCS test.
2. First minimum impulse test.
3. GNCS/MTVC takeover test, PUGS test, and SPS performance test.
4. Second minimum impulse test.
5. Second SCS test.
6. Landmark tracking exercise.
7. LM rendezvous radar test over WSMR.

The fourth period of activities (10^d19^h until 11^d00^h g.e.t.) consists of the deorbit and subsequent landing and recovery.

3.0 SYMBOLS

AOS	acquisition of signal
CDH	constant differential height
CM	command module
CMC	command module computer
CSM	command and service modules
DAP	digital autopilot
DSKY	display keyboard
EMS	entry monitoring system
e.s.t.	eastern standard time
ETR	Eastern Test Range
FDAI	Flight director attitude indicator
g.e.t.	ground elapsed time
G.m.t.	Greenwich mean time
GNCS	guidance and navigation control system

IMU	inertial measurement unit
LES	launch escape system
LET	launch escape tower
LOS	loss of signal
MCC	midcourse correction
MILA	Merritt Island Launch Area
MNBY	mean of the nearest Besselian year
MSFN	Manned Space Flight Network
MTVC	manual thrust vector control
NCC	corrective combination; phasing (and/or height) maneuver
NSR	slow rate; concentric maneuver for the NCC/NSR sequence
PUGS	propellant utilization and gauging system
RCS	reaction control system
RR	rendezvous radar
SCS	stabilization and control system
SLA	spacecraft LM adapter
SM	service module
SPS	service propulsion system
T&D	transposition and docking
TPF	terminal phase finalization
TPI	terminal phase initiation
WSMR	White Sands Missile Range
ΔV	incremental velocity

4.0 INPUT DATA USED TO GENERATE THE OPERATIONAL TRAJECTORY

Inputs used to compute the Apollo 7 operational trajectory are given in the following sources:

Mission objectives	ref. 3
Mission constraints	ref. 4
Launch vehicle/spacecraft separation vector	ref. 5
Spacecraft mass properties, performance, constants	table I
Spacecraft guidance equations and logic and reentry digital autopilot	refs. 6, 7, 8
Tracking equipment and the location of the ground stations	ref. 9
Aerodynamic heating data	refs. 10, 11
MSFN	table II
U. S. 1962 standard atmosphere	ref. 12
Fischer Earth model of 1960	ref. 13

5.0 OPERATIONAL TRAJECTORY DESCRIPTION

This section of the report presents detailed descriptions of the major mission events occurring during each period of activity. Table III lists the detailed test objectives which require specific trajectory and vehicle attitude planning. The discussion of each period of activities indicates which of these are satisfied within that period.

Table IV presents the acquisition and loss-of-signal data for stations tracking during the mission; lighting data are given in table V. Figure 1 presents the ground tracks for the entire mission.

Listed below are the changes reflected in Revision 1 of the Apollo 7 operational trajectory.

1. The SPS gimbal trim angles have been corrected.

2. The third SPS burn has been shortened to 5 sec.

3. The attitude necessary to accomplish the radiator heat rejection and degradation test objective (DTO - M7.19) has been incorporated.

4. The fifth SPS burn has been increased to 61.5 seconds. The out-of-plane component of velocity has been directed to the south.

5. The sixth SPS burn is now retrograde.

6. The seventh SPS burn has been decreased to 7.7 seconds.

The orbital IMU alignments used on Apollo 7 are as follows.

Approximately four orbits before the TPI burn, the IMU will be aligned such that at TPI burn ignition the outer gimbal angle is 0°, the inner gimbal angle is equal to the elevation angle between the CSM and S-IVB, and the middle gimbal angle is 0°. This IMU alignment is used for the first two SPS maneuvers.

On SPS maneuvers three through seven, the IMU is aligned such that the IMU gimbal angles read 0° roll, 0° pitch, and 0° yaw at SPS burn ignition.

For the deorbit burn, the IMU is aligned such that the IMU gimbal angles read 180° roll, 180° pitch, and 0° yaw at SPS deorbit burn ignition.

This document reflects an IMU alignment for the performance of the radiator heat rejection and degradation test. The radiator test starts at $03^{d}22^{h}30^{m}$, and at this time the spacecraft has an attitude of 0° pitch, yaw right 90°, and roll left 128° with respect to the local horizontal system. The IMU is aligned such that the IMU gimbal angles read 0° roll, 0° pitch, and 0° yaw initially.

5.1 First Period of Activities

5.1.1 Prelaunch.- Apollo 7 will be launched from the Eastern Test Range, launch complex 34. The time of lift-off for the trajectory simulation was 1500 hours G.m.t. (10 a.m. e.s.t.), September 20, 1968.

The CM IMU will be initially aligned with the positive X-axis stable member located 72° from true north; the positive Z-axis will coincide with the negative pad vertical; and the positive Y-axis will complete a right-handed coordinate system. The spacecraft positive X-axis will be aligned along the positive pad vertical, the positive Z-axis will be directed 280° 12' east of north and the Y-axis will complete a right-handed system (ref. 14).

The Apollo 7 mission launch window is constrained by the following

considerations:

1. Orbital IMU alignment requirements.

2. Lighting at end of mission.

3. Lighting for SLA photography.

The earliest lift-off time is determined by the orbital IMU alignment requirements. The lighting for SLA photography determines the latest lift-off time. The launch window will open at 1500 hours G.m.t. and will close at approximately 2000 hours G.m.t. A plot of the launch window, which has been extracted from reference 15, is presented in figure 2.

5.1.2 Launch.- The sequence of events during launch is given in table VI.

5.1.3 Earth parking orbit.- The activities of the spacecraft, crew, and ground during the earth parking orbit phase of the mission will consist of system checkout, IMU alignment, cabin purge, and S-IVB attitude control by the crew. The sequence of events for the earth parking orbit is presented in reference 16.

As the S-IVB/CSM approaches the U. S. mainland at the end of the first revolution, the remaining S-IVB propellants and cold gases are dumped through the J2 engine. The effective ΔV resulting from the propellant dump is applied essentially at perigee; thus apogee is raised to about 172 n. mi.

5.1.4 S-IVB/CSM separation.- S-IVB/CSM separation will occur approximately $02^{h}55^{m}00.05^{s}$ g.e.t. over Hawaii approximately 44 minutes before entering darkness. The separation is accomplished by a 2.6-second firing of the four SM RCS, positive X-axis thrusters; the resultant ΔV is 1.0 fps.

Following S-IVB/CSM separation, the spacecraft will translate forward approximately 50 ft and will fire the SM RCS, negative X-axis thrusters to damp the relative velocity between the two vehicles to 0.50 fps. This will be followed by a pitch maneuver of 180° and a roll left of 60° for viewing the deployed spacecraft LM adapter (SLA). Following this attitude maneuver, the positive X-axis jets will be fired to eliminate the remaining 0.50-fps relative velocity. The spacecraft will maintain the attitude necessary for the crew to photograph the deployed SLA. The conditions at S-IVB/CSM separation are given in reference 5. The sequence of events following separation is shown in table VII.

5.1.5 Phasing maneuver.- Over Antigua ($03^{h}20^{m}00^{s}$ g.e.t., the CSM will make a horizontal retrograde RCS maneuver of 7.7 fps to set up the proper phasing conditions ahead of the S-IVB for rendezvous maneuvers

planned to start about 23 hours later. This maneuver will account for the effect of the differential drag between the two vehicles. This retrograde CSM phase maneuver was computed, however, assuming that the S-IVB experiences the highest possible drag in the broadside attitude, i.e., assuming a maximum area of 1715 ft^2. Thus, for any resultant S-IVB attitude the CSM would still be at least 15 n. mi. ahead of the S-IVB at the time of the first SPS burn planned on the next day. It is currently planned that the S-IVB will be left in orbital rate with the open SLA in a retrograde attitude (pitched 180°). Since attitude control propellant is exhausted shortly after S-IVB/CSM separation, an approximate tumbling S-IVB area of 1400 ft^2 was assumed for the nominal.

5.1.6 Detailed test objectives.- Detailed test objectives requiring specific trajectory and attitude planning satisfied during this period of activities are as follows:

P20.8	Transposition and simulated docking
P7.21	SLA deployment
S20.12	S-IVB manual attitude control

5.2 Second Period of Activities

5.2.1 First SPS corrective combination burn (NCC1).- At $01^d02^h24^m55^s$ g.e.t., the CSM will perform the first SPS maneuver, when the CSM will nominally be leading the S-IVB by about 73 n. mi. This 209-fps burn which is pitched down 75° (with respect to the local horizontal) is the first maneuver of a two-impulse transfer to a desired phase angle of 1.32° and an 8-n. mi. Δh offset for the concentric setup behind and below the S-IVB. This corrective combination maneuver will also correct any small out-of-plane angle that may have built up.

The 9.6-second SPS maneuver will be performed under GNCS control and will be preceded by a 15-second, four-jet ullage. The targeting for the NCC1 maneuver is shown in table VIII(a). The current plan is to trim all residuals on this burn if greater than about 1 fps and less than 10 fps. The relative motion from 20^h00^m g.e.t. to rendezvous is shown in figure 4.

5.2.2 Possible corrective maneuver (NCC2).- In this nominal trajectory simulation NCC2 is zero; however, because of the small possibility of large residual errors in the calculation and execution of NCC1 it is conceivable that a corrective maneuver might have to be performed prior to NSR. Therefore, it is scheduled at about 27^h30^m g.e.t. over Ascension so that the ground can use updated tracking to calculate and transmit the

new NCC/NSR solution as the vehicles cross the U.S. If the NCC2 ΔV required is greater than about 15 fps the SPS will be used.

5.2.3 SPS coelliptic maneuver burn (NSR).- At $01^d03^h59^m56^s$ g.e.t. the CSM will approach the desired coelliptic situation which is 82.9 n. mi. behind and 8 n. mi. below the S-IVB. The coelliptic maneuver (NSR) will nominally be the second SPS burn producing a ΔV of 186 fps (8.4 seconds), retrograde, pitched up about 62° from the local horizontal. This maneuver, as all previous ones, is ground-computed, since the CSM does not have the necessary onboard logic; the targeting is given in table VIII(b). It is now planned to vary the targeted Δh by ±1 n. mi. in the event of residual errors in the NCC1 burn to preserve the nominal TPI time; thus the actual time of NSR may vary in real time by ±35 seconds. Onboard optical tracking will commence after this maneuver so that the CSM can compute the upcoming terminal phase burns.

5.2.4 Terminal phase initiation (TPI).- About 82 minutes after the coelliptic maneuver, when the CSM is nominally at the midpoint of darkness during the 19th revolution, the TPI burn will be performed. TPI ($01^d05^h22^m51^s$ g.e.t.) will be initiated when the angle between the line of sight to the S-IVB and the local horizontal reaches 27.45°; the maneuver will be calculated with the onboard Lambert program using a transfer time of 2100 seconds. The range to the S-IVB at the time of TPI will be about 15 n. mi., and the vehicles will be about 18 minutes from sunrise. The 17-fps TPI maneuver will be performed with the RCS, and the CSM will be pitched up about 32°. Targeting for this maneuver is shown in table VIII(c).

5.2.5 Midcourse corrections.- The midcourse corrections at 14 minutes and 21 minutes after TPI are nominally very small - ≈3.0 fps and ≈0.3 fps, respectively. However, even reasonable dispersions may result in corrections of 2 to 5 fps each. These midcourse corrections will be calculated with the onboard Lambert program.

5.2.6 Terminal phase finalization (TPF).- At about $01^d05^h58^m$ g.e.t., when the CSM is about 1 n. mi. from the S-IVB, the optical braking approach should begin, using the SM RCS for range-rate and line-of-sight corrections. Station keeping at about 100 to 200 ft should begin about 7 minutes later as the vehicles pass over Hawaii. The theoretical velocity match would require 18 fps; however, an additional amount will be required for line-of-sight and attitude-control maneuvering.

5.2.7 Separation maneuver.- As the vehicles begin the 20th revolution at $01^d06^h20^m00^s$ g.e.t., after about 20 minutes of station keeping, the CSM will leave the vicinity of the S-IVB by applying a 2-fps posigrade RCS maneuver. The CSM ΔV and the higher S-IVB orbital decay rate produce a relative motion history in which the S-IVB moves ahead of and below the CSM. The S-IVB orbit lifetime will be approximately 4 days. Figure 5

is a time history of S-IVB/CSM separation.

5.2.8 Detailed test objectives.- The detailed test objectives which required specific trajectory or attitude planning satisfied during this period of activities are as follows:

P1.13	GNCS ΔV control - two tests
P1.10	Sextant tracking
P20.13	CSM-active rendezvous

5.3 Third Period of Activities

5.3.1 Third SPS burn.- The third SPS burn will occur during the 58th revolution over Carnarvon, $03^{d}19^{h}42^{m}35^{s}$ g.e.t. This 5.1-second burn is performed under SCS control and is preceded by a 15-second, four-jet ullage; the resulting ΔV is approximately 116 fps.

The third SPS burn is targeted to obtain a 90-n. mi. perigee altitude, to raise apogee as much as possible, and to rotate the line of apsides in order to maintain the back-up RCS deorbit landing control; the targeting is shown in table VIII(d). This maneuver must be at least 5 seconds in duration to achieve the control mode test objective.

The direction of the ΔV application is pitched up 17.7° with respect to the local horizontal and yawed -122° with respect to the velocity vector. This maneuver will establish a sufficient orbital lifetime to complete the nominal mission and provide RCS deorbit capability.

This burn has been reduced to 5 seconds, because of updated information about the propellant gauging system. This subject will be treated thoroughly in a later document.

5.3.2 Fourth SPS burn.- The fourth SPS burn [table VIII(e)] will be preceded by a two-jet ullage and will be the first of two minimum impulse burns performed during the nominal Apollo 7 mission. This maneuver will be under GNCS control, and the ΔV of approximately 15 fps is horizontal, in plane, and posigrade. This maneuver will be performed over the ETR at $05^{d}00^{h}52^{m}02^{s}$ g.e.t. during the 77th revolution.

5.3.3 Fifth SPS burn.- The fifth SPS maneuver [table VIII(f)] is the SPS performance and PUGS test and a control mode change-over test. It will be initiated under the GNCS control mode and after 30 seconds the control mode is changed over to MTVC. The resulting ΔV is approximately 1465 fps. This burn is preceded by a two-jet, 21-second ullage, is 61.5 seconds long, and is targeted with an in-plane component

to achieve a 95- by 241-n. mi. orbit. This maneuver will occur $06^{d}21^{h}07^{m}49^{s}$ g.e.t. over the ETR during the 104th revolution.

This burn has been lengthened slightly to provide additional confidence in obtaining the test objectives and to decrease the burn profile's sensitivity to anticipated SPS loading changes. The direction of the out of plane ΔV has been changed to provide a back-up ETR landing opportunity in the 165th revolution.

5.3.4 Sixth SPS burn.- The sixth SPS burn [table VIII(g)] will be the second minimum impulse test performed during Apollo 7, and the resulting ΔV is applied in plane and in a retrograde direction. It will be performed under GNCS control and will result in 17-fps ΔV. The tracking stations for this maneuver will be those of the ETR. The burn will occur during the 132nd revolution at $08^{d}18^{h}13^{m}15^{s}$ g.e.t. This maneuver is also preceded by a two-jet, 21-second ullage.

This burn has been made retrograde to avoid a slight rise in perigee height.

5.3.5 Seventh SPS burn.- The seventh SPS burn [table VIII(h)] will occur at $09^{d}23^{h}04^{m}37^{s}$ g.e.t. in the 151st revolution over the ETR. The control mode for this maneuver is SCS, and the burn is preceded by a four-jet, 15-second ullage.

This 7.5-second SPS maneuver is targeted to optimize the perigee location for a contingency deorbit into the primary recovery area one revolution later than the nominal deorbit and landing. In addition, the seventh SPS burn is targeted to maintain the 90- by 220- n. mi. orbit.

This burn has been shortened to 7.5 seconds because no out of plane component was necessary.

5.3.6 Detailed test objectives.- During this period of activities the following detailed test objectives requiring specific trajectory and/or attitude planning are satisfied.

P3.15	SPS performance
P2.5	SCS ΔV control - two tests
P3.14	SPS minimum impulse - two tests
P3.16	PUGS test
P2.6	GNCS/MTVC takeover

M7.19 Radiator Heat Rejection and Degradation

Objective P6.8 - LM rendezvous radar test objective can be satisfied during this period of activities when the revolution(s) in which to perform the test have been selected. Candidate revolutions are 45, 48, 107 and 136.

5.4 Fourth Period of Activities

5.4.1 Eighth SPS burn (deorbit).- The eight scheduled SPS burns for Apollo 7 are completed with a 10.2-second GNCS-mode burn which deorbits the spacecraft. The targeting for this burn is given in table VIII(i), and the conditions at deorbit and entry are given in table IX. At termination of the burn approximately 13.75 minutes will remain for the flight crew to verify deorbit conditions, separate from the SM, and orient the CM to the entry attitude. The deorbit maneuver is initiated with the spacecraft in a retrograde attitude and pitched down 31.7° below the line of sight to the horizon. This retrograde attitude will allow the flight crew to verify the proper deorbit attitude and to manually take over control of the spacecraft should the GNCS system fail to function normally.

The eighth SPS burn will occur in the 163rd revolution at $10^d19^h39^m54^s$ g.e.t. Touchdown will occur at 67° W longitude in the 164th revolution.

5.4.2 Preentry sequence.- At $10^d19^h40^m04^s$ g.e.t. the SPS engine will be cutoff and a 13.75-minute coast to atmospheric entry will be started. Approximately 90 seconds following the deorbit burn the SM will be jettisoned while the CM is still in the retrograde attitude. The CM will then be oriented to the proper entry attitude.

5.4.3 Reentry.- Reentry at 400 000-ft altitude will occur at 31.03° N geodetic latitude and 98.83° W longitude approximately 13.75 minutes after SPS retrofire.

Landing of the CM following the nominal reentry trajectory control will occur $10^d20^h09^m53^s$ g.e.t. at 29.8° N geodetic latitude and 67 W longitude. The CM maneuver envelope for this prime recovery area is shown in figure 6. The deorbit point and subsequent ground track and pertinent geographic locations of various deorbit and reentry events are shown in figure 5.

5.4.4 Reentry targeting.- Figure 7 presents a representative reentry corridor for Apollo 7. The reentry corridor in figure 7 shows several reentry limit lines. The bottom line is a 10g rolling-reentry undershoot boundary. The next line is the SPS target line. The mode I line

represents the lift-vector-up overshoot boundary for normal CMC operation. This line includes worst case L/D, atmospheric, and latitude dispersions. The mode II line is an overshoot boundary, assuming a lift-vector-down until 0.2g then lift-vector-up. The mode III line is also lift-vector-down until 0.2g, but then the spacecraft is rolled during reentry. Mode II and mode III lines include worst case L/D, atmospheric, and latitude dispersions. For further discussion of the overshoot boundaries and their use in contingency cases refer to references 17 and 18.

The reentry interface velocity and flight-path angle for the end-of-mission SPS deorbit is also shown in figure 7. The reentry state vector data is presented in table IX.

For guided reentries, the optimum target location after the SPS deorbit is on the ground track at the 55° bank-angle contour line if the L/D is between 0.42 and 0.26. If necessary, the target location for cross-range targeting can be placed off the ground track anywhere to within approximately 22 n. mi. of the theoretical maneuver envelope lateral boundaries. However, the included target was selected on the ground track. For a further discussion concerning the reentry targeting criteria and reentry monitoring refer to references 19 and 20.

Figure 8 presents the altitude-range profile of the reentry trajectory; significant trajectory and guidance events are noted. Figure 9 shows the commanded bank angle, load factor, and altitude profiles versus time from the reentry interface. The maximum load factor experienced for this trajectory was 3.3g. Figures 10 and 11 present other pertinent reentry trajectory data as a function of reentry-phase time from the 400 000-ft altitude to reentry interface. The maximum total heating rate obtained was 59.8 $(Btu/ft^2)/sec$, and the total heat load was 12 649 Btu/ft^2.

The outer, middle, and inner gimbal angle time histories during reentry are shown in figure 12.

Shown in figure 13 are the communications and radar blackout regions based upon data from reference 21. The normal CMC DSKY display quantities for the final phase of reentry, program P67, are shown in figure 14.

Figure 15 shows the velocity-load factor that can be expected from the EMS during the nominal guided reentry. The reentry sequence of events are indicated on the velocity-load factor trace. The EMS pattern is like the one being used on Apollo 7. Figure 15 also presents the EMS-computed velocity and range counter range to go.

The CM was on the drogue chutes for approximately 53 seconds and on the main chutes for 4 minutes 45 seconds.

5.4.5 Detailed test objectives.- Detailed test objectives requiring specific trajectory and/or attitude planning which were satisfied during this period of activities are:

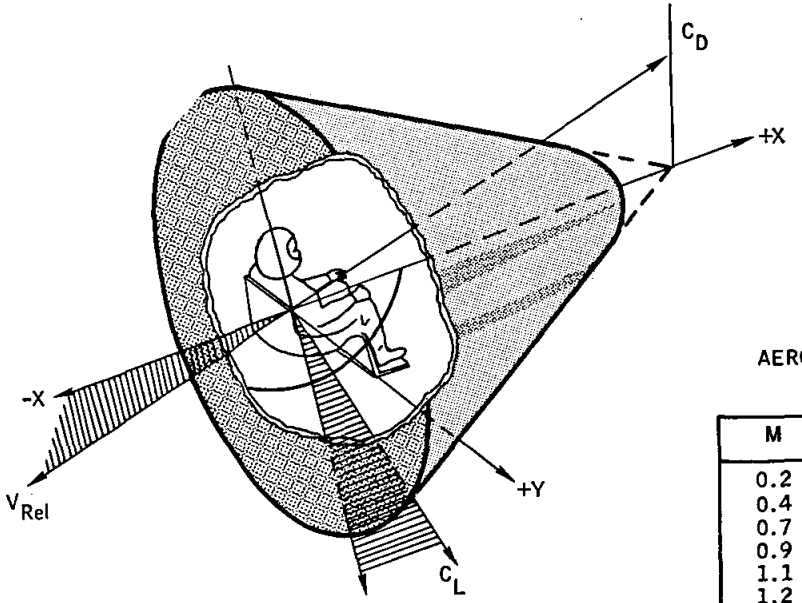
P1.13	GNCS ΔV control
S20.9	Manual retrograde attitude and orientation

6.0 MISSION PROFILE EVALUATION

This trajectory profile simulates all profile-related test objectives. While the opportunities for accomplishment of the LM Rendezvous Radar test have been identified, the detailed sequence of events has not been worked out.

TABLE I.- SPACECRAFT PARAMETERS

(a) CM aerodynamic coefficients[a]



AERODYNAMIC COEFFICIENTS AT TRIM ANGLE OF ATTACK AS A FUNCTION OF MACH NUMBER

M	C_L	C_D	L/D	α
0.2	0.23620	0.82481	0.28637	170.8
0.4	0.23987	0.85383	0.28093	167.36
0.7	0.25990	0.98724	0.26326	164.68
0.9	0.31644	1.06770	0.29639	162.00
1.1	0.48722	1.1748	0.41474	155.29
1.2	0.47292	1.1603	0.40757	155.49
1.35	0.55642	1.2831	0.43367	154.36
1.65	0.54558	1.2700	0.42959	153.56
2.0	0.52922	1.2791	0.41374	153.5
2.4	0.50380	1.2486	0.40348	154.02
3.0	0.47542	1.2245	0.38826	154.5
4.0	0.43792	1.2208	0.35873	156.44
10.0	0.42515	1.2307	0.34545	157.09
29.5	0.38353	1.2951	0.29614	160.37

Center of gravity location in body coordinates

X_{cg} = 1040.58 in

Y_{cg} =-.11 in

Z_{cg} = 5.91 in

[a] These data were taken from references 23 and 26.

TABLE I.- SPACECRAFT PARAMETERS - Continued

(b) Performance

SPS engine performance[a]	
Thrust (steady state), lb	21 080
Specific impulse, sec	312.34
Propellant flow rate, lb/sec	67.49
SPS buildup ΔT, sec	0.015
SPS tailoff ΔT, sec	0.54
SM RCS engine performance[b]	
Thrust (4 jet), lb	399.2
Specific impulse	276.0
Propellant flow rate (4 jet), lb/sec	1.45

(c) Weights[c]

CM (with RCS), lb	12 384
SM (with RCS), lb	10 604
SLA ring, lb	91
Tanked SPS propellant, lb	9 379
CSM with propellant, lb	32 458

(d) Earth and atmosphere constants

Drag coefficient (CSM, LM, CSM/LM docked)	2.0
Area (CSM, LM, CSM/LM docked), ft^2	129.5
Earth equatorial radius a, ft	20 925 741.47
Earth polar radius b, ft	20 855 591.48
Earth rotational rate ω_E, rad/sec	$0.729211506 \times 10^{-4}$
Gravity coefficients for oblate earth model: A_0, ft/sec^2	32.146536
A_1, ft/sec^2	0.0521882775
A_2, ft/sec^2	$3.616483034 \times 10^{-5}$

[a]These data were obtained from reference 22.

[b]These data were obtained from reference 23.

[c]These data were obtained from reference 24.

TABLE I.- SPACECRAFT PARAMETERS - Concluded

(d) Earth and atmosphere constants - Concluded

Radius of spherical earth R_E, ft	20 925 738.19
Gravity at sea level, g, ft/sec^2	32.146546
Number of feet per nautical mile, ft/n. mi.	6076.11549
Number of degrees per radian, deg/rad	57.2957795
Atmospheric pressure at sea level, P_{SL}, lb/in^2	14.6959722
Density at sea level, $P_{\infty SL}$, $slug/ft^3$	2.3768846×10^{-3}
Sound speed at sea level, C_{SL}, fps	1116.45
Viscosity at sea level, μ_{SL}, slug/fps	$3.73717340 \times 10^{-7}$
Gravity constant for converting mass to weight, g_{WM}, ft/sec^2	32.174049

TABLE II.- TRACKING SITES

C Band sites	Unified S Band sites	Ships
MILA	MILA	Vanguard
PAT	GBM	Mercury
GBI	BDA	Huntsville
BDA	CYI	Redstone
BDQ	ACN	
ANT	MAD	
CYI	CRO	
ASC	HSK	
CRO	GWM	
HAW	HAW	
CAL	GDS	
WHS	GYM	
PRE	TEX	
TAN	ANG	
WOM	RID	
	NBE	
	PIR	

TABLE III.- DETAILED TEST OBJECTIVES REQUIRING SPECIFIC TRAJECTORY AND ATTITUDE PLANNING[a]

Objective category number	Title
M7.19	Radiator heat rejection and degradation
P3.15	SPS performance
P1.13	GNCS ΔV control
P2.5	SCS ΔV control
P1.10	Sextant tracking
P20.13	CSM-active rendezvous
P20.8	Transposition and simulated docking
P7.21	SLA deployment
P3.14	SPS minimum impulse
P3.16	Primary auxiliary propellant and gauging system
P2.6	GNCS/MTVC takeover
P6.8	Overpass simulation with LM rendezvous radar
S20.9	Manual retrograde attitude and orientation
S20.12	S-IVB manual attitude control

[a]These objectives were obtained from reference 3.

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7

(a) CSM unified S-band sites

MSFN STATION NAME	ACQUISITION DAY	HR	MIN	SEC	LOSS DAY	HR	MIN	SEC	ELAPSED TIME MIN	SEC	MAX ELEVATION DEG	MAX RANGE N MI	MIN RANGE N MI	REVOLUTION NUMBER
HAW (S)	0	2	54	54	0	3	0	43	5	49	17.21	936.10	371.80	2.85
USS HUNTSVILLE	0	2	58	25	0	3	6	28	8	3	54.57	888.37	151.86	2.89
GDS (S)	0	3	3	26	0	3	11	6	7	39	18.70	862.75	340.36	2.97
GYM (S)	0	3	4	28	0	3	12	21	7	52	28.08	889.63	249.93	2.97
PIR (S)	0	3	3	27	0	3	11	6	7	39	18.47	862.09	343.28	2.97
TEX (S)	0	3	7	32	0	3	15	25	7	53	19.80	807.81	329.40	3.02
MIL (S)	0	3	11	12	0	3	19	0	7	48	37.04	821.07	204.82	3.05
GBM (S)	0	3	11	55	0	3	19	55	8	0	24.65	782.74	285.70	3.05
BDA (S)	0	3	14	46	0	3	22	17	7	31	16.67	580.05	386.92	3.08
ANG (S)	0	3	16	57	0	3	24	13	7	16	12.20	635.41	478.29	3.10
USS VANGUARD	0	3	18	44	0	3	24	34	5	49	4.24	942.36	747.68	3.12
ACN (S)	0	3	30	32	0	3	38	53	8	21	20.13	939.38	381.71	3.24
CRO (S)	0	4	1	51	0	4	10	44	8	53	45.89	963.97	209.06	3.59
GWM (S)	0	4	17	45	0	4	18	58	1	12	.52	940.00	940.00	3.67
HAW (S)	0	4	27	42	0	4	35	35	7	52	22.52	813.09	293.63	3.83
USS HUNTSVILLE	0	4	33	38	0	4	41	4	7	26	12.39	801.88	449.79	3.91
GDS (S)	0	4	37	52	0	4	45	43	7	51	22.86	841.17	294.98	3.95
PIR (S)	0	4	37	52	0	4	45	43	7	50	22.67	842.95	296.82	3.95
GYM (S)	0	4	39	17	0	4	47	21	8	3	20.86	748.08	317.73	3.98
TEX (S)	0	4	42	21	0	4	50	25	8	3	61.57	946.64	145.16	4.02
MIL (S)	0	4	46	0	0	4	53	56	7	56	21.74	885.93	322.44	4.04
GBM (S)	0	4	46	37	0	4	54	42	8	5	27.62	908.84	267.82	4.06
BDA (S)	0	4	51	7	0	4	54	33	3	25	1.64	951.84	876.42	4.06
ANG (S)	0	4	51	7	0	4	59	38	8	31	25.05	731.53	298.41	4.09
ACN (S)	0	5	5	9	0	5	13	37	8	28	14.89	817.14	484.00	4.22
CRO (S)	0	5	37	52	0	5	43	32	5	39	4.55	961.55	777.32	4.55
GWM (S)	0	5	48	51	0	5	56	59	8	7	27.22	810.71	266.07	4.68
HAW (S)	0	6	3	24	0	6	9	56	6	32	8.36	770.98	552.87	4.82
USS HUNTSVILLE	0	6	8	44	0	6	16	9	7	24	14.97	632.83	403.24	4.90
GDS (S)	0	6	12	34	0	6	19	48	7	14	12.82	685.28	452.63	4.94
PIR (S)	0	6	12	35	0	6	19	48	7	13	12.68	687.01	455.59	4.94
GYM (S)	0	6	14	0	0	6	22	10	8	9	44.68	879.56	181.86	4.96
MIL (S)	0	6	22	15	0	6	26	13	3	58	2.09	960.81	861.15	5.00
TEX (S)	0	6	17	5	0	6	24	48	7	43	15.49	892.77	412.12	5.00
GBM (S)	0	6	22	54	0	6	27	9	4	14	2.36	895.71	847.69	5.02
ANG (S)	0	6	27	48	0	6	31	54	4	6	2.19	936.41	883.39	5.05
ACN (S)	0	6	43	38	0	6	45	20	1	41	.64	1026.35	1026.35	5.19
USS MERCURY	0	7	22	3	0	7	27	33	5	29	4.73	910.28	702.40	5.62
GWM (S)	0	7	24	15	0	7	31	7	6	52	9.57	932.46	523.07	5.67
HAW (S)	0	7	38	45	0	7	45	11	6	26	7.70	800.63	581.97	5.84

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
GDS (S)	0	7	48	49	0	7	51	51	3	2	1.50	874.90	874.90	5.90
USS HUNTSVILLE	0	7	43	16	0	7	51	33	8	17	25.19	726.97	284.44	5.90
PIR (S)	0	7	48	52	0	7	51	48	2	56	1.44	878.00	878.00	5.90
GYM (S)	0	7	49	19	0	7	55	39	6	19	6.96	804.47	639.97	5.94
USS MERCURY	0	8	55	11	0	9	3	18	8	7	25.73	734.14	268.06	6.63
HAW (S)	0	9	13	7	0	9	21	1	7	53	18.45	833.06	354.33	6.84
USS HUNTSVILLE	0	9	18	14	0	9	25	48	7	34	14.49	939.62	437.48	6.88
USS MERCURY	0	10	30	17	0	10	37	52	7	34	19.36	922.54	330.21	7.62
HAW (S)	0	10	47	43	0	10	55	52	8	9	24.02	834.66	303.44	7.82
USS REDSTONE	0	11	5	6	0	11	10	0	4	53	2.84	904.78	890.97	7.95
USS MERCURY	0	12	5	27	0	12	12	43	7	15	11.87	870.23	462.15	8.64
HAW (S)	0	12	24	55	0	12	27	23	2	27	1.09	925.15	925.15	8.78
USS REDSTONE	0	12	37	23	0	12	46	22	8	59	31.17	1065.76	293.28	8.97
ACN (S)	0	13	4	20	0	13	11	47	7	27	10.90	749.41	556.31	9.23
USS MERCURY	0	13	40	12	0	13	48	5	7	53	26.73	912.27	265.58	9.62
GWM (S)	0	13	46	19	0	13	53	23	7	4	10.01	946.82	537.43	9.68
USS REDSTONE	0	14	12	7	0	14	21	15	9	7	32.59	1025.70	288.19	9.96
ACN (S)	0	14	38	33	0	14	46	58	8	25	29.90	842.56	266.96	10.23
USS MERCURY	0	15	14	45	0	15	22	51	8	6	26.58	874.58	274.05	10.62
GWM (S)	0	15	20	24	0	15	28	46	8	21	39.78	918.53	209.88	10.67
USS REDSTONE	0	15	47	23	0	15	56	3	8	40	17.17	899.33	462.81	10.95
CYI (S)	0	16	21	46	0	16	22	44	0	58	.42	920.79	920.79	11.22
USS MERCURY	0	16	51	19	0	16	55	2	3	43	1.68	908.85	879.65	11.58
GWM (S)	0	16	57	31	0	17	0	45	3	13	1.19	970.01	934.65	11.63
USS REDSTONE	0	17	22	26	0	17	31	20	8	54	23.53	854.42	365.30	11.96
CYI (S)	0	17	52	37	0	18	0	12	7	34	19.24	601.55	335.62	12.23
MAD (S)	0	17	58	7	0	18	1	43	3	35	1.93	903.38	818.56	12.25
RID (S)	0	17	58	6	0	18	1	38	3	32	1.86	902.24	822.36	12.25
HSK (S)	0	18	38	30	0	18	43	57	5	27	3.47	887.65	868.41	12.69
NBE (S)	0	18	38	23	0	18	44	0	5	36	3.71	879.82	857.77	12.69
USS REDSTONE	0	18	57	7	0	19	6	10	9	3	42.94	815.02	221.53	12.94
ANG (S)	0	19	15	58	0	19	23	34	7	35	15.10	902.43	411.33	13.11
USS VANGUARD	0	19	22	47	0	19	26	39	3	51	2.18	894.29	816.44	13.15
CYI (S)	0	19	26	58	0	19	35	2	8	3	31.41	790.43	226.24	13.24
MAD (S)	0	19	30	54	0	19	37	10	6	16	7.54	789.42	579.27	13.27
RID (S)	0	19	30	52	0	19	37	8	6	16	7.47	796.45	581.42	13.27
CRO (S)	0	20	3	11	0	20	10	42	7	31	9.84	995.70	610.31	13.61
HSK (S)	0	20	11	8	0	20	19	43	8	34	15.28	837.79	497.07	13.70
NBE (S)	0	20	11	6	0	20	19	43	8	37	15.69	830.15	489.34	13.70
USS REDSTONE	0	20	32	53	0	20	39	20	6	26	6.55	852.89	700.89	13.92
MIL (S)	0	20	50	3	0	20	53	18	3	14	1.45	919.62	860.90	14.05
GBM (S)	0	20	49	14	0	20	54	47	5	32	4.97	870.35	691.84	14.07
ANG (S)	0	20	50	30	0	20	58	12	7	42	22.05	572.55	304.92	14.09
BDA (S)	0	20	52	34	0	20	58	21	5	47	5.13	926.42	675.55	14.11
USS VANGUARD	0	20	55	7	0	21	2	37	7	30	16.24	874.99	376.44	14.16
CYI (S)	0	21	2	1	0	21	9	48	7	46	22.61	870.97	293.97	14.24
MAD (S)	0	21	5	0	0	21	11	21	6	20	7.80	767.89	574.11	14.26
RID (S)	0	21	4	58	0	21	11	19	6	21	7.82	773.20	573.71	14.26
CRO (S)	0	21	36	48	0	21	46	4	9	16	35.08	725.78	269.30	14.60

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
HSK (S)	0	21	45	17	0	21	54	20	9	2	29.90	1066.64	307.79	14.72
NBE (S)	0	21	45	16	0	21	54	21	9	4	31.04	1064.48	299.45	14.72
TEX (S)	0	22	19	29	0	22	25	28	5	58	6.23	819.85	640.88	15.01
MIL (S)	0	22	22	14	0	22	29	55	7	40	21.81	925.53	304.60	15.05
GBM (S)	0	22	22	25	0	22	30	18	7	53	46.03	516.23	170.13	15.05
ANG (S)	0	22	27	4	0	22	31	48	4	44	2.99	783.08	764.88	15.08
BDA (S)	0	22	25	53	0	22	33	43	7	49	24.11	848.49	278.98	15.10
USS VANGUARD	0	22	29	21	0	22	37	26	8	4	25.63	733.61	265.87	15.15
MAD (S)	0	22	40	11	0	22	44	14	4	3	2.34	916.01	809.06	15.22
RID (S)	0	22	40	7	0	22	44	13	4	5	2.40	909.15	806.35	15.22
CYI (S)	0	22	36	41	0	22	44	46	8	5	41.13	860.93	186.04	15.24
CRO (S)	0	23	11	55	0	23	20	43	8	48	22.77	1060.45	378.96	15.59
HSK (S)	0	23	19	59	0	23	28	46	8	46	19.71	1058.11	416.60	15.69
NBE (S)	0	23	19	59	0	23	28	47	8	48	20.24	1056.97	409.43	15.69
GYM (S)	0	23	50	23	0	23	57	40	7	17	12.95	896.20	444.11	15.98
TEX (S)	0	23	52	51	1	0	0	55	8	4	34.64	816.29	210.41	16.01
MIL (S)	0	23	56	36	1	0	4	41	8	4	27.48	756.93	251.24	16.06
GBM (S)	0	23	57	15	1	0	5	1	7	46	24.35	888.23	276.45	16.06
ANG (S)	1	0	4	54	1	0	5	41	0	46	.25	912.26	912.26	16.08
BDA (S)	1	0	0	17	1	0	8	23	8	6	29.47	750.85	237.70	16.11
USS VANGUARD	1	0	3	57	1	0	12	0	8	2	37.49	838.92	197.93	16.15
CYI (S)	1	0	11	31	1	0	19	14	7	43	20.63	608.23	328.65	16.22
CRO (S)	1	0	47	10	1	0	55	46	8	36	18.43	1017.26	439.58	16.61
HSK (S)	1	0	55	6	1	1	2	8	7	1	7.27	1002.31	698.82	16.67
NBE (S)	1	0	55	5	1	1	2	11	7	6	7.58	999.12	688.12	16.67
HAW (S)	1	1	15	30	1	1	19	30	3	59	2.12	947.60	837.19	16.84
USS HUNTSVILLE	1	1	18	57	1	1	26	41	7	44	17.97	851.04	355.61	16.90
GDS (S)	1	1	24	15	1	1	31	12	6	56	10.05	849.07	505.24	16.95
PIR (S)	1	1	24	17	1	1	31	12	6	55	9.95	852.09	507.87	16.95
GYM (S)	1	1	24	29	1	1	32	39	8	10	28.45	873.55	244.77	16.98
TEX (S)	1	1	27	41	1	1	35	27	7	46	29.38	549.82	238.10	17.00
MIL (S)	1	1	31	34	1	1	39	22	7	47	30.62	527.66	231.15	17.05
GBM (S)	1	1	32	13	1	1	39	52	7	38	17.69	865.10	353.28	17.07
BDA (S)	1	1	34	57	1	1	42	59	8	1	31.98	827.39	226.01	17.10
ANG (S)	1	1	38	9	1	1	42	50	4	40	2.71	790.18	785.52	17.10
USS VANGUARD	1	1	38	45	1	1	46	10	7	25	12.15	826.73	462.33	17.14
CYI (S)	1	1	48	30	1	1	50	44	2	13	1.02	907.37	907.37	17.18
ACN (S)	1	1	53	15	1	1	56	32	3	17	1.40	957.61	913.70	17.23
CRO (S)	1	2	22	1 NCCI 1:2:25	1	2	30	52	8	50	34.07	1057.53	264.66	17.59
HAW (S)	1	2	47	47	1	2	55	37	7	49	27.25	826.73	245.13	17.84
USS HUNTSVILLE	1	2	53	16	1	3	1	15	7	59	33.96	940.34	219.29	17.91
GDS (S)	1	2	57	55	1	3	6	11	8	16	20.74	791.45	340.10	17.96
PIR (S)	1	2	57	55	1	3	6	12	8	16	20.50	790.92	342.95	17.96
GYM (S)	1	2	58	9	1	3	7	28	9	19	29.47	951.34	268.45	17.99
TEX (S)	1	3	2	4	1	3	10	45	8	40	24.65	788.25	328.82	18.01
MIL (S)	1	3	5	37	1	3	14	48	9	11	32.43	715.17	277.76	18.05
GBM (S)	1	3	6	18	1	3	15	30	9	11	53.79	1013.14	195.81	18.07
BDA (S)	1	3	9	13	1	3	17	30	8	17	14.58	1031.34	516.32	18.09
ANG (S)	1	3	11	6	1	3	20	16	9	9	25.32	895.84	361.94	18.11

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION					LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC		DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
USS VANGUARD	1	3	14	1	NCC2	1	3	19	23	5	21	3.43	1081.46	921.24	18.11
ACN (S)	1	3	24	46	1:3:30	1	3	34	54	10	8	42.19	1094.55	279.11	18.23
CRO (S)	1	3	57	35	1:4:00	1	4	5	52	8	16	22.39	1025.00	343.61	18.57
GWM (S)	1	4	11	7	NSR	1	4	16	30	5	22	4.52	870.92	712.60	18.67
HAW (S)	1	4	23	33		1	4	30	39	7	6	16.08	801.82	354.75	18.82
USS HUNTSVILLE	1	4	29	27		1	4	36	15	6	48	12.36	855.31	419.87	18.90
GDS (S)	1	4	33	27		1	4	40	42	7	15	21.33	763.15	285.01	18.95
PIR (S)	1	4	33	27		1	4	40	42	7	14	21.05	763.46	287.80	18.95
GYM (S)	1	4	34	58		1	4	42	31	7	33	35.50	872.99	191.76	18.97
TEX (S)	1	4	37	54		1	4	45	34	7	40	49.98	861.54	150.19	19.00
MIL (S)	1	4	41	46		1	4	48	37	6	50	11.99	847.26	442.94	19.03
GBM (S)	1	4	42	23		1	4	49	27	7	3	13.96	851.15	404.67	19.04
ANG (S)	1	4	46	57	TPI	1	4	54	19	7	22	16.12	916.40	380.26	19.08
ACN (S)	1	5	1	13	1:05:23	1	5	8	6	6	53	8.54	996.56	614.91	19.21
CRO (S)	1	5	34	48		1	5	36	39	1	51	.43	985.29	970.72	19.53
GWM (S)	1	5	43	50		1	5	52	0	8	10	73.11	929.24	133.53	19.66
HAW (S)	1	5	58	50	TPF	1	6	4	58	6	7	7.16	917.85	585.71	19.82
USS HUNTSVILLE	1	6	3	57		1	6	11	18	7	21	17.53	930.15	352.52	19.89
PIR (S)	1	6	7	55		1	6	14	17	6	22	8.37	933.86	553.70	19.93
GDS (S)	1	6	7	54		1	6	14	18	6	23	8.47	935.31	550.63	19.93
GYM (S)	1	6	9	15		1	6	16	55	7	39	25.87	942.55	267.24	19.95
TEX (S)	1	6	12	36	SEP	1	6	19	11	6	34	8.97	951.89	548.11	19.97
USS MERCURY	1	7	16	12		1	7	23	10	6	57	10.32	748.38	512.92	20.63
GWM (S)	1	7	19	49		1	7	25	35	5	46	5.19	907.25	678.34	20.65
HAW (S)	1	7	33	45		1	7	40	21	6	36	7.67	879.72	570.11	20.84
USS HUNTSVILLE	1	7	38	18		1	7	46	21	8	2	64.94	892.91	136.75	20.90
GYM (S)	1	7	45	20		1	7	49	11	3	51	1.90	860.66	842.90	20.92
USS MERCURY	1	8	50	6		1	8	58	2	7	56	67.56	493.13	134.31	21.62
HAW (S)	1	9	8	2		1	9	15	54	7	51	35.62	915.45	205.89	21.83
USS HUNTSVILLE	1	9	13	31		1	9	19	50	6	19	6.99	846.38	615.00	21.86
USS MERCURY	1	10	25	7		1	10	32	30	7	23	13.55	843.87	421.46	22.63
HAW (S)	1	10	42	43		1	10	50	0	7	17	13.38	684.34	438.60	22.81
USS REDSTONE	1	10	58	44		1	11	5	23	6	39	7.29	831.59	673.00	22.95
ACN (S)	1	11	26	3		1	11	28	53	2	50	.96	1041.40	981.85	23.23
USS MERCURY	1	12	0	12		1	12	7	27	7	14	14.00	669.01	410.26	23.62
GWM (S)	1	12	7	54		1	12	10	38	2	44	.84	905.41	879.71	23.67
USS REDSTONE	1	12	31	56		1	12	40	55	8	59	59.25	994.77	177.43	23.96
ACN (S)	1	12	58	23		1	13	6	44	8	20	19.31	875.37	390.54	24.24
USS MERCURY	1	13	34	36		1	13	42	36	8	0	34.17	834.34	210.79	24.63
GWM (S)	1	13	40	29		1	13	48	5	7	35	18.02	956.02	356.22	24.69
USS REDSTONE	1	14	6	41		1	14	15	32	8	50	19.18	773.52	415.41	24.95
ACN (S)	1	14	33	8		1	14	41	0	7	52	12.91	838.17	483.87	25.22
USS MERCURY	1	15	9	22		1	15	16	46	7	24	12.08	821.76	460.93	25.61
GWM (S)	1	15	14	58		1	15	22	40	7	42	14.91	864.85	418.30	25.66
USS REDSTONE	1	15	41	53		1	15	50	21	8	28	17.93	1022.09	440.35	25.97
CYI (S)	1	16	13	40		1	16	18	49	5	8	4.07	901.11	738.59	26.24
USS REDSTONE	1	17	16	32		1	17	25	34	9	2	24.15	742.62	350.63	26.95
ANG (S)	1	17	37	53		1	17	40	40	2	47	.87	964.87	925.72	27.10
CYI (S)	1	17	46	28		1	17	54	26	7	57	30.41	860.52	236.67	27.25

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
MAD (S)	1	17	51	26	1	17	56	22	4	56	3.84	881.41	724.65	27.27
RID (S)	1	17	51	25	1	17	56	19	4	54	3.78	888.51	727.54	27.27
HSK (S)	1	18	31	48	1	18	38	23	6	34	5.83	1001.68	741.89	27.71
NBE (S)	1	18	31	44	1	18	38	24	6	40	6.12	997.80	731.09	27.71
USS REDSTONE	1	18	51	13	1	18	59	59	8	45	28.92	885.96	298.17	27.93
ANG (S)	1	19	9	36	1	19	17	46	8	9	33.04	884.85	230.49	28.10
USS VANGUARD	1	19	15	37	1	19	21	23	5	45	5.47	878.76	670.31	28.14
CYI (S)	1	19	21	3	1	19	29	1	7	58	20.94	735.16	310.88	28.24
MAD (S)	1	19	24	40	1	19	31	4	6	24	8.26	753.61	551.06	28.27
RID (S)	1	19	24	38	1	19	31	2	6	24	8.22	760.24	552.28	28.27
CRO (S)	1	19	56	41	1	20	4	52	8	10	15.78	893.02	448.42	28.61
HSK (S)	1	20	4	54	1	20	13	33	8	39	18.30	810.69	428.91	28.70
NBE (S)	1	20	4	52	1	20	13	34	8	42	18.81	804.30	421.37	28.70
USS REDSTONE	1	20	27	44	1	20	32	1	4	17	2.32	989.18	890.37	28.89
MIL (S)	1	20	42	39	1	20	48	22	5	42	5.14	898.04	689.22	29.06
GBM (S)	1	20	42	19	1	20	49	14	6	55	10.09	740.86	521.52	29.06
ANG (S)	1	20	44	39	1	20	51	53	7	14	12.74	691.54	450.91	29.09
BDA (S)	1	20	45	48	1	20	52	37	6	49	8.83	899.65	547.01	29.11
USS VANGUARD	1	20	48	46	1	20	56	34	7	48	21.68	829.85	304.81	29.16
CYI (S)	1	20	56	1	1	21	3	42	7	40	24.72	914.06	269.55	29.23
MAD (S)	1	20	58	56	1	21	4	49	5	53	6.30	803.20	616.42	29.26
RID (S)	1	20	58	54	1	21	4	47	5	53	6.33	807.78	615.47	29.26
CRO (S)	1	21	30	42	1	21	39	46	9	3	31.29	742.26	283.73	29.59
HSK (S)	1	21	39	4	1	21	48	0	8	56	28.95	853.47	307.86	29.69
NBE (S)	1	21	39	3	1	21	48	1	8	57	30.08	850.88	299.37	29.69
GYM (S)	1	22	11	36	1	22	15	12	3	36	1.75	908.59	855.16	29.96
TEX (S)	1	22	12	33	1	22	19	40	7	7	11.73	685.03	478.37	30.01
MIL (S)	1	22	15	46	1	22	23	45	7	59	36.45	887.36	203.92	30.05
GBM (S)	1	22	16	7	1	22	24	4	7	57	81.54	502.05	126.25	30.05
ANG (S)	1	22	21	34	1	22	25	8	3	34	1.70	872.99	828.87	30.08
BDA (S)	1	22	19	30	1	22	27	29	7	58	30.71	825.29	229.46	30.10
USS VANGUARD	1	22	23	6	1	22	31	9	8	3	26.03	731.30	259.31	30.15
MAD (S)	1	22	35	54	1	22	36	10	0	16	.11	916.18	916.18	30.22
RID (S)	1	22	35	48	1	22	36	13	0	24	.16	913.39	913.39	30.22
CYI (S)	1	22	30	29	1	22	38	29	7	59	50.48	851.09	155.74	30.24
CRO (S)	1	23	5	51	1	23	14	21	8	29	18.90	1010.27	421.18	30.61
HSK (S)	1	23	13	39	1	23	22	4	8	24	18.62	981.35	424.65	30.68
NBE (S)	1	23	13	39	1	23	22	6	8	27	19.31	1042.50	414.55	30.70
USS HUNTSVILLE	1	23	39	32	1	23	44	30	4	58	3.69	894.66	764.76	30.90
GDS (S)	1	23	45	13	1	23	49	7	3	53	1.90	850.47	830.63	30.95
PIR (S)	1	23	45	15	1	23	49	7	3	51	1.87	853.16	832.05	30.95
GYM (S)	1	23	43	44	1	23	51	33	7	49	22.50	887.64	301.18	30.97
TEX (S)	1	23	46	25	1	23	54	30	8	5	48.95	841.93	163.18	31.02
MIL (S)	1	23	50	20	1	23	58	12	7	51	35.72	900.19	203.18	31.07
GBM (S)	1	23	50	57	1	23	58	37	7	40	17.53	818.42	353.43	31.07
ANG (S)	1	23	57	58	1	23	58	47	0	49	.15	910.50	910.50	31.07
BDA (S)	1	23	54	3	2	0	1	55	7	52	69.05	921.83	129.55	31.09
USS VANGUARD	1	23	57	41	2	0	5	33	7	51	30.21	846.62	229.85	31.14
CYI (S)	2	0	5	21	2	0	12	21	6	59	10.33	891.31	498.17	31.22

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
CRO (S)	2	0	40	46	2	0	49	27	8	41	16.64	807.18	461.08	31.60
HSK (S)	2	0	49	6	2	0	54	51	5	45	4.64	929.82	802.43	31.66
NBE (S)	2	0	49	3	2	0	54	56	5	52	4.88	918.93	792.67	31.66
HAW (S)	2	1	7	49	2	1	13	59	6	10	5.85	931.01	676.55	31.83
USS HUNTSVILLE	2	1	12	14	2	1	20	14	7	59	38.40	902.99	199.69	31.91
GDS (S)	2	1	17	36	2	1	24	52	7	15	12.10	851.43	453.19	31.96
GYM (S)	2	1	18	10	2	1	26	2	7	52	44.60	513.91	172.45	31.96
PIR (S)	2	1	17	37	2	1	24	52	7	14	12.04	854.25	454.54	31.96
TEX (S)	2	1	21	16	2	1	29	4	7	47	18.44	775.11	338.50	32.01
MIL (S)	2	1	25	4	2	1	32	59	7	54	20.85	743.34	307.84	32.06
GBM (S)	2	1	25	53	2	1	33	30	7	36	20.41	887.24	312.44	32.06
BDA (S)	2	1	28	30	2	1	36	14	7	43	26.89	897.66	252.20	32.10
ANG (S)	2	1	31	22	2	1	36	58	5	36	5.29	812.56	657.61	32.10
USS VANGUARD	2	1	32	32	2	1	39	10	6	37	9.23	744.14	525.70	32.12
ACN (S)	2	1	45	31	2	1	51	21	5	49	5.39	867.55	693.81	32.23
CRO (S)	2	2	15	21	2	2	24	28	9	7	64.88	962.60	172.58	32.60
HAW (S)	2	2	41	6	2	2	49	22	8	16	32.92	763.05	223.72	32.83
USS HUNTSVILLE	2	2	46	57	2	2	54	44	7	46	17.98	800.49	351.24	32.91
GDS (S)	2	2	51	39	2	2	59	23	7	44	22.96	844.40	285.20	32.96
PIR (S)	2	2	51	39	2	2	59	24	7	44	22.78	846.40	286.81	32.96
GYM (S)	2	2	52	56	2	3	0	44	7	47	19.98	795.64	318.57	32.98
TEX (S)	2	2	56	6	2	3	3	51	7	45	32.02	545.31	219.02	33.00
MIL (S)	2	2	59	40	2	3	7	38	7	57	39.86	842.78	185.41	33.05
GBM (S)	2	3	0	19	2	3	8	16	7	56	64.25	893.85	134.56	33.07
BDA (S)	2	3	3	41	2	3	9	29	5	48	5.74	860.54	643.75	33.07
ANG (S)	2	3	4	57	2	3	13	1	8	3	24.34	757.22	277.85	33.10
ACN (S)	2	3	18	34	2	3	27	13	8	38	34.79	781.12	234.22	33.23
CRO (S)	2	3	50	22	2	3	58	18	7	55	13.85	979.14	500.55	33.58
GWM (S)	2	4	2	49	2	4	10	4	7	15	10.97	771.24	525.80	33.67
HAW (S)	2	4	16	23	2	4	23	32	7	8	12.51	658.45	445.68	33.82
USS HUNTSVILLE	2	4	22	13	2	4	29	21	7	7	12.72	688.08	435.34	33.90
GDS (S)	2	4	26	7	2	4	33	32	7	24	18.00	633.72	341.48	33.95
PIR (S)	2	4	26	8	2	4	33	32	7	24	17.80	634.73	344.18	33.95
GYM (S)	2	4	27	35	2	4	35	34	7	59	40.29	823.12	183.15	33.97
TEX (S)	2	4	30	32	2	4	38	25	7	52	32.75	865.88	216.38	34.01
MIL (S)	2	4	34	48	2	4	41	0	6	11	7.19	787.42	594.64	34.03
GBM (S)	2	4	35	24	2	4	41	51	6	27	7.90	811.87	571.18	34.03
ANG (S)	2	4	40	5	2	4	46	45	6	40	8.22	845.07	578.28	34.08
ACN (S)	2	4	54	49	2	5	0	26	5	37	4.30	975.41	792.38	34.22
GWM (S)	2	5	36	50	2	5	45	0	8	10	20.96	764.13	332.23	34.67
HAW (S)	2	5	52	0	2	5	58	2	6	2	5.72	911.03	639.10	34.82
USS HUNTSVILLE	2	5	56	47	2	6	4	27	7	39	20.04	853.46	316.46	34.91
GDS (S)	2	6	1	10	2	6	6	39	5	28	5.12	838.07	663.65	34.93
PIR (S)	2	6	1	11	2	6	6	38	5	26	5.04	840.53	666.74	34.93
GYM (S)	2	6	2	19	2	6	9	37	7	17	14.92	641.57	396.05	34.95
TEX (S)	2	6	6	8	2	6	11	16	5	8	3.94	781.95	724.13	34.97
GWM (S)	2	7	13	36	2	7	17	59	4	22	2.71	887.02	790.13	35.64
USS MERCURY	2	7	8	36	2	7	16	19	7	42	17.86	894.59	367.16	35.64
HAW (S)	2	7	26	36	2	7	33	35	6	58	11.59	654.39	457.11	35.83

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
USS HUNTSVILLE	2	7	31	15	2	7	39	13	7	57	23.20	758.69	286.90	35.89
USS MERCURY	2	8	42	55	2	8	50	59	8	4	22.75	746.54	298.05	36.63
HAW (S)	2	9	0	46	2	9	8	50	8	3	34.38	781.66	207.49	36.83
USS HUNTSVILLE	2	9	7	17	2	9	11	35	4	18	2.61	836.42	794.52	36.85
USS MERCURY	2	10	18	12	2	10	25	25	7	13	13.53	673.27	420.34	37.62
HAW (S)	2	10	36	6	2	10	42	11	6	4	5.77	926.45	652.90	37.81
USS REDSTONE	2	10	50	55	2	10	58	36	7	40	11.96	935.07	520.84	37.96
ACN (S)	2	11	17	49	2	11	23	16	5	26	3.79	1010.32	837.54	38.23
USS MERCURY	2	11	52	59	2	12	0	22	7	23	14.87	865.87	391.53	38.64
GWM (S)	2	11	59	58	2	12	4	38	4	40	3.26	900.97	744.79	38.68
USS REDSTONE	2	12	24	39	2	12	33	40	9	1	30.83	714.27	282.17	38.95
ACN (S)	2	12	50	54	2	12	59	43	8	49	33.11	797.66	257.50	39.23
USS MERCURY	2	13	27	24	2	13	35	26	8	2	34.94	783.57	204.89	39.62
GWM (S)	2	13	33	5	2	13	41	7	8	2	21.74	735.57	302.86	39.68
USS REDSTONE	2	13	59	40	2	14	8	11	8	30	20.04	1038.61	399.84	39.97
ACN (S)	2	14	26	26	2	14	33	7	6	41	7.63	816.51	638.74	40.21
USS MERCURY	2	15	2	31	2	15	8	54	6	22	7.79	799.21	573.85	40.60
GWM (S)	2	15	8	16	2	15	14	46	6	29	7.56	847.10	600.71	40.65
USS REDSTONE	2	15	34	37	2	15	43	14	8	37	16.65	836.85	459.29	40.96
CYI (S)	2	16	5	30	2	16	12	7	6	36	7.66	939.51	604.66	41.25
USS REDSTONE	2	17	9	10	2	17	18	15	9	5	48.42	1009.99	207.03	41.96
ANG (S)	2	17	29	1	2	17	34	52	5	51	5.36	858.37	713.56	42.11
CYI (S)	2	17	39	0	2	17	47	13	8	12	27.44	734.45	256.46	42.24
MAD (S)	2	17	43	33	2	17	49	12	5	39	5.45	854.14	659.07	42.26
RID (S)	2	17	43	31	2	17	49	10	5	38	5.43	849.75	659.87	42.26
CRO (S)	2	18	17	24	2	18	20	50	3	26	1.25	923.46	915.97	42.59
HSK (S)	2	18	23	56	2	18	31	14	7	18	9.45	988.19	611.61	42.70
NBE (S)	2	18	23	52	2	18	31	16	7	23	9.77	979.19	602.66	42.70
USS REDSTONE	2	18	44	5	2	18	52	19	8	14	17.83	1052.37	427.79	42.94
BDA (S)	2	19	6	20	2	19	8	50	2	30	.98	899.57	899.57	43.09
ANG (S)	2	19	2	9	2	19	10	25	8	16	64.32	881.42	146.77	43.11
USS VANGUARD	2	19	7	37	2	19	14	23	6	46	8.15	883.93	579.32	43.16
CYI (S)	2	19	13	50	2	19	21	39	7	48	26.50	892.54	257.67	43.23
MAD (S)	2	19	17	7	2	19	23	33	6	25	8.37	765.03	547.34	43.26
RID (S)	2	19	17	5	2	19	23	31	6	26	8.41	758.37	546.03	43.26
CRO (S)	2	19	49	0	2	19	57	36	8	35	22.59	780.68	346.81	43.60
HSK (S)	2	19	57	22	2	20	6	2	8	39	24.87	896.62	338.65	43.69
NBE (S)	2	19	57	21	2	20	6	3	8	42	25.80	891.81	329.83	43.69
TEX (S)	2	20	33	33	2	20	35	12	1	38	.62	934.38	934.38	43.99
MIL (S)	2	20	34	30	2	20	41	26	6	56	10.17	710.65	524.54	44.05
GBM (S)	2	20	34	24	2	20	42	2	7	37	17.50	640.26	373.65	44.05
BDA (S)	2	20	38	1	2	20	45	25	7	24	14.96	943.24	406.03	44.10
ANG (S)	2	20	37	41	2	20	44	14	6	33	7.15	906.36	611.92	44.10
USS VANGUARD	2	20	41	14	2	20	49	14	8	0	24.34	776.22	277.81	44.15
CYI (S)	2	20	48	33	2	20	56	18	7	45	26.64	874.88	252.92	44.25
MAD (S)	2	20	51	38	2	20	56	56	5	18	4.73	851.66	674.64	44.25
RID (S)	2	20	51	35	2	20	56	55	5	19	4.81	844.38	671.71	44.25
CRO (S)	2	21	23	25	2	21	32	12	8	46	32.07	1027.25	273.71	44.61
HSK (S)	2	21	31	38	2	21	40	28	8	50	29.98	977.49	297.04	44.71

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
NBE (S)	2	21	31	37	2	21	40	30	8	52	31.29	973.63	287.78	44.71
GYM (S)	2	22	2	56	2	22	8	49	5	53	5.71	841.00	678.10	44.98
TEX (S)	2	22	4	40	2	22	12	26	7	45	18.04	872.26	364.61	45.02
MIL (S)	2	22	8	13	2	22	16	16	8	2	61.53	893.16	142.75	45.07
GBM (S)	2	22	8	35	2	22	16	43	8	7	32.99	803.71	222.66	45.07
ANG (S)	2	22	15	5	2	22	17	15	2	10	1.02	868.14	868.14	45.07
BDA (S)	2	22	12	4	2	22	19	58	7	53	54.36	939.28	150.25	45.10
USS VANGUARD	2	22	15	42	2	22	23	40	7	57	46.84	856.78	163.68	45.14
CYI (S)	2	22	23	3	2	22	31	1	7	58	24.50	731.69	269.09	45.23
CRO (S)	2	22	58	31	2	23	6	57	8	26	16.05	894.50	465.20	45.60
HSK (S)	2	23	6	16	2	23	14	19	8	3	14.22	1003.44	504.77	45.69
NBE (S)	2	23	6	15	2	23	14	21	8	6	14.69	995.47	495.26	45.69
USS HUNTSVILLE	2	23	31	5	2	23	37	43	6	38	8.08	813.67	598.27	45.90
GDS (S)	2	23	36	44	2	23	42	21	5	36	4.99	895.00	689.95	45.96
GYM (S)	2	23	36	6	2	23	44	3	7	57	42.71	516.52	184.18	45.96
PIR (S)	2	23	36	45	2	23	42	21	5	35	4.95	895.14	691.69	45.96
TEX (S)	2	23	38	56	2	23	47	5	8	9	24.75	725.25	278.93	46.01
MIL (S)	2	23	42	53	2	23	50	48	7	55	22.63	778.32	292.72	46.06
GBM (S)	2	23	43	38	2	23	51	13	7	35	16.76	849.76	363.32	46.06
ANG (S)	2	23	50	25	2	23	52	44	2	19	.87	865.77	865.77	46.09
BDA (S)	2	23	46	28	2	23	54	24	7	56	46.63	855.02	163.94	46.11
USS VANGUARD	2	23	50	14	2	23	57	52	7	37	25.94	541.42	257.22	46.13
CYI (S)	2	23	58	21	3	0	4	12	5	51	5.56	906.58	648.24	46.21
CRO (S)	3	0	33	17	3	0	42	1	8	44	22.85	900.16	366.49	46.59
HSK (S)	3	0	42	23	3	0	46	13	3	49	1.82	1022.01	940.68	46.65
NBE (S)	3	0	42	17	3	0	46	19	4	1	2.01	1011.12	931.52	46.65
HAW (S)	3	0	59	36	3	1	7	0	7	24	11.55	895.99	496.38	46.84
USS HUNTSVILLE	3	1	4	34	3	1	12	50	8	16	37.34	785.79	206.50	46.91
GDS (S)	3	1	9	53	3	1	17	24	7	31	17.38	905.86	358.15	46.96
PIR (S)	3	1	9	54	3	1	17	24	7	30	17.25	908.41	360.00	46.96
GYM (S)	3	1	10	38	3	1	18	34	7	56	27.09	826.82	256.12	46.98
TEX (S)	3	1	13	54	3	1	21	35	7	41	22.67	900.05	289.40	47.01
MIL (S)	3	1	17	37	3	1	25	31	7	54	32.64	834.89	214.36	47.05
GBM (S)	3	1	18	20	3	1	26	0	7	40	26.77	557.31	251.13	47.05
BDA (S)	3	1	21	3	3	1	28	32	7	29	16.38	831.09	364.32	47.10
ANG (S)	3	1	23	33	3	1	29	56	6	23	7.56	827.84	568.99	47.10
USS VANGUARD	3	1	25	24	3	1	30	58	5	33	5.39	813.53	649.64	47.12
ACN (S)	3	1	37	16	3	1	44	26	7	10	10.40	909.57	515.64	47.24
CRO (S)	3	2	7	50	3	2	16	56	9	5	58.76	1009.24	181.78	47.59
HAW (S)	3	2	33	37	3	2	41	45	8	8	37.89	874.53	202.54	47.83
USS HUNTSVILLE	3	2	39	36	3	2	47	10	7	34	15.47	855.81	389.05	47.90
GDS (S)	3	2	44	5	3	2	51	44	7	39	26.56	570.16	253.95	47.95
PIR (S)	3	2	44	5	3	2	51	44	7	39	26.24	570.29	256.31	47.95
GYM (S)	3	2	45	28	3	2	53	16	7	48	22.03	808.25	293.66	47.97
TEX (S)	3	2	48	27	3	2	56	19	7	51	38.94	871.81	186.32	48.02
MIL (S)	3	2	52	12	3	2	59	53	7	40	29.49	537.31	232.02	48.04
GBM (S)	3	2	52	46	3	3	0	39	7	52	28.29	809.94	239.91	48.06
BDA (S)	3	2	56	54	3	3	0	54	4	0	2.18	825.12	796.34	48.06
ANG (S)	3	2	57	24	3	3	5	27	8	3	34.96	784.50	206.44	48.10

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ACN (S)	3	3	11	12	3	3	19	24	8	12	18.92	791.91	372.63	48.22
CRO (S)	3	3	43	9	3	3	50	6	6	56	7.66	1018.31	675.98	48.57
GWM (S)	3	3	54	43	3	4	2	55	8	11	18.67	808.94	378.66	48.68
HAW (S)	3	4	5	4	3	4	15	51	6	46	9.46	766.01	524.63	48.82
USS HUNTSVILLE	3	4	14	40	3	4	21	50	7	10	13.36	665.06	421.26	48.89
GDS (S)	3	4	18	31	3	4	25	41	7	10	14.29	622.85	398.43	48.94
PIR (S)	3	4	18	31	3	4	25	41	7	9	14.13	625.09	401.41	48.94
GYM (S)	3	4	20	4	3	4	27	54	7	49	67.51	917.16	129.25	48.96
TEX (S)	3	4	23	3	3	4	30	37	7	34	17.15	820.07	352.52	49.00
MIL (S)	3	4	27	53	3	4	32	26	4	32	3.15	891.94	751.10	49.02
GBM (S)	3	4	28	31	3	4	33	19	4	47	3.24	774.44	746.87	49.02
ANG (S)	3	4	33	18	3	4	38	10	4	51	3.51	933.33	751.04	49.07
ACN (S)	3	4	48	42	3	4	51	35	2	52	1.28	932.64	932.64	49.19
USS MERCURY	3	5	28	15	3	5	32	53	4	38	2.94	870.84	816.68	49.62
GWM (S)	3	5	29	29	3	5	37	10	7	40	13.97	870.20	439.58	49.67
HAW (S)	3	5	44	30	3	5	50	37	6	7	6.65	827.94	601.24	49.84
USS HUNTSVILLE	3	5	49	8	3	5	56	59	7	51	20.13	737.59	312.85	49.90
GDS (S)	3	5	54	7	3	5	58	6	3	59	2.30	912.26	785.87	49.92
PIR (S)	3	5	54	9	3	5	58	5	3	55	2.24	915.01	788.97	49.92
GYM (S)	3	5	54	59	3	6	1	26	6	27	8.61	731.22	537.83	49.94
TEX (S)	3	5	59	51	3	6	2	7	2	15	.34	921.28	901.50	49.96
GWM (S)	3	7	7	23	3	7	9	6	1	42	.74	899.81	899.81	50.63
USS MERCURY	3	7	0	39	3	7	8	51	8	11	25.84	790.53	280.91	50.63
HAW (S)	3	7	18	50	3	7	26	5	7	15	14.88	912.01	386.71	50.85
USS HUNTSVILLE	3	7	23	47	3	7	31	16	7	28	17.03	861.26	355.89	50.88
USS MERCURY	3	8	35	21	3	8	43	16	7	54	19.98	813.33	327.56	51.63
HAW (S)	3	8	53	7	3	9	1	2	7	54	22.18	730.62	289.40	51.83
USS MERCURY	3	10	10	33	3	10	17	43	7	10	13.08	651.25	430.02	52.62
HAW (S)	3	10	29	21	3	10	33	11	3	49	1.94	838.67	817.01	52.79
USS REDSTONE	3	10	42	47	3	10	51	3	8	15	18.23	834.42	390.49	52.96
ACN (S)	3	11	5	24	3	11	16	22	6	58	7.13	581.14	697.34	53.25
USS MERCURY	3	11	45	11	3	11	52	47	7	36	15.81	778.76	373.69	53.63
GWM (S)	3	11	51	42	3	11	57	35	5	53	5.93	851.42	624.71	53.67
USS REDSTONE	3	12	16	56	3	12	25	46	8	50	25.40	774.66	288.07	53.95
ACN (S)	3	12	43	1	3	12	51	53	8	52	46.71	820.88	199.52	54.22
USS MERCURY	3	13	19	39	3	13	27	30	7	51	32.51	831.12	213.87	54.61
GWM (S)	3	13	25	14	3	13	33	18	8	3	29.34	747.77	237.33	54.67
USS REDSTONE	3	13	52	3	3	14	0	21	8	18	17.82	1024.37	428.89	54.97
ACN (S)	3	14	19	33	3	14	24	16	4	42	2.97	964.40	837.10	55.20
USS MERCURY	3	14	55	24	3	15	0	6	4	42	3.35	921.36	741.00	55.59
GWM (S)	3	15	1	23	3	15	5	45	4	22	2.74	846.97	789.75	55.63
USS REDSTONE	3	15	26	46	3	15	35	29	8	43	17.73	790.79	437.18	55.96
CYI (S)	3	15	57	3	3	16	4	34	7	31	12.71	858.07	469.42	56.25
MAD (S)	3	16	3	18	3	16	5	44	2	26	.99	889.95	889.95	56.25
RID (S)	3	16	3	18	3	16	5	35	2	16	.95	892.19	892.19	56.25
HSK (S)	3	16	44	4	3	16	46	48	2	43	.91	989.15	949.01	56.69
NBE (S)	3	16	43	57	3	16	46	54	2	56	1.08	978.34	940.27	56.69
USS REDSTONE	3	17	1	13	3	17	10	20	9	6	69.99	990.52	166.17	56.96
ANG (S)	3	17	20	17	3	17	27	36	7	18	11.24	711.40	524.10	57.10

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
USS VANGUARD	3	17	27	47	3	17	30	12	2	25	.44	951.74	944.40	57.14
CYI (S)	3	17	31	2	3	17	39	18	8	15	29.98	747.67	240.66	57.24
MAD (S)	3	17	35	13	3	17	41	21	6	8	6.94	802.42	605.22	57.26
RID (S)	3	17	35	11	3	17	41	19	6	7	6.93	797.38	605.67	57.26
CRO (S)	3	18	8	9	3	18	13	57	5	47	4.53	758.48	739.24	57.59
HSK (S)	3	18	15	36	3	18	23	23	7	47	12.35	917.21	524.64	57.70
NBE (S)	3	18	15	33	3	18	23	24	7	50	12.74	909.08	516.00	57.70
USS REDSTONE	3	18	36	22	3	18	43	47	7	25	10.66	803.90	582.88	57.92
GBM (S)	3	18	53	42	3	18	58	22	4	39	3.06	937.42	811.46	58.07
BDA (S)	3	18	56	57	3	19	2	8	5	11	3.90	945.10	755.60	58.11
ANG (S)	3	18	54	12	3	19	2	24	8	12	34.87	889.66	226.24	58.11
USS VANGUARD	3	18	59	11	3	19	6	38	7	26	12.22	837.25	471.82	58.16
CYI (S)	3	19	5	58	3	19	13	42	7	44	24.64	919.87	273.48	58.23
MAD (S)	3	19	9	3	3	19	15	25	6	21	8.09	756.64	555.82	58.26
RID (S)	3	19	9	0	3	19	15	22	6	22	8.14	749.82	554.37	58.26
CRO (S)	3	19	41	1	3	19	49	39	8	38	41.37	966.59	211.48	58.60
HSK (S)	3	19	49	17	3	19	58	2	8	44	21.68	754.37	365.28	58.70
NBE (S)	3	19	49	16	3	19	58	3	8	46	22.36	751.64	357.55	58.70
TEX (S)	3	20	24	27	3	20	27	34	3	7	1.50	832.36	760.36	59.00
MIL (S)	3	20	26	23	3	20	32	42	6	18	9.49	808.73	441.71	59.06
GBM (S)	3	20	26	28	3	20	33	21	6	53	17.93	809.69	283.20	59.06
BDA (S)	3	20	29	56	3	20	36	31	6	35	14.51	688.44	325.08	59.09
ANG (S)	3	20	30	48	3	20	34	44	3	55	2.66	798.78	671.27	59.09
USS VANGUARD	3	20	33	17	3	20	40	17	7	0	40.23	530.83	141.70	59.14
CYI (S)	3	20	40	41	3	20	47	29	6	48	20.63	658.51	246.09	59.24
MAD (S)	3	20	44	12	3	20	47	5	2	53	.88	767.28	757.72	59.24
RID (S)	3	20	44	9	3	20	47	5	2	55	.97	767.62	752.52	59.24
CRO (S)	3	21	14	56	3	21	23	30	8	33	22.32	873.38	354.15	59.60
HSK (S)	3	21	22	59	3	21	31	36	8	36	23.25	834.82	346.37	59.70
NBE (S)	3	21	22	58	3	21	31	37	8	39	24.00	829.68	338.64	59.70
GYM (S)	3	21	53	57	3	21	59	38	5	40	6.91	737.24	522.11	59.97
TEX (S)	3	21	56	3	3	22	2	57	6	54	16.58	757.87	303.17	60.02
MIL (S)	3	21	59	39	3	22	6	38	6	58	31.86	620.56	173.61	60.04
GBM (S)	3	22	0	15	3	22	7	1	6	45	14.79	743.49	314.89	60.07
BDA (S)	3	22	3	21	3	22	10	23	7	1	52.09	540.99	116.73	60.09
USS VANGUARD	3	22	7	0	3	22	14	2	7	1	50.19	527.15	119.85	60.14
CYI (S)	3	22	14	21	3	22	21	16	6	54	16.50	756.12	304.93	60.23
CRO (S)	3	22	49	23	3	22	57	29	8	5	15.79	977.48	457.93	60.59
HSK (S)	3	22	57	7	3	23	4	21	7	13	10.13	930.27	575.82	60.67
NBE (S)	3	22	57	6	3	23	4	24	7	17	10.50	927.42	566.16	60.67
USS HUNTSVILLE	3	23	21	35	3	23	27	47	6	11	10.23	851.39	432.04	60.90
GDS (S)	3	23	27	11	3	23	32	12	5	1	5.16	750.61	564.30	60.94
PTR (S)	3	23	27	12	3	23	32	12	5	0	5.10	753.72	566.63	60.94
GYM (S)	3	23	26	52	3	23	33	47	6	55	53.52	780.22	117.84	60.97
TEX (S)	3	23	29	55	3	23	36	37	6	42	25.04	657.12	208.87	60.99
MIL (S)	3	23	33	49	3	23	40	24	6	35	19.73	644.97	250.93	61.04
GBM (S)	3	23	34	33	3	23	40	47	6	14	13.39	785.38	334.67	61.06
BDA (S)	3	23	37	12	3	23	44	1	6	48	48.21	739.39	123.71	61.09
USS VANGUARD	3	23	40	54	3	23	47	20	6	26	14.52	687.28	323.08	61.13

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
CYI (S)	3	23	49	32	3	23	52	54	3	22	1.63	831.70	757.98	61.19
CRO (S)	4	0	23	23	4	0	31	53	8	29	27.34	976.71	302.52	61.60
HAW (S)	4	0	49	32	4	0	56	17	6	44	16.30	846.15	320.13	61.83
USS HUNTSVILLE	4	0	54	51	4	1	1	46	6	54	37.94	789.06	153.24	61.90
GDS (S)	4	0	59	53	4	1	6	19	6	26	15.66	664.99	300.30	61.95
PIR (S)	4	0	59	53	4	1	6	19	6	25	15.45	664.59	303.26	61.95
GYM (S)	4	1	0	55	4	1	7	30	6	34	18.94	651.78	259.46	61.96
TEX (S)	4	1	4	2	4	1	10	30	6	28	16.64	673.54	286.27	62.00
MIL (S)	4	1	7	39	4	1	14	27	6	48	37.34	800.93	150.96	62.04
GBM (S)	4	1	8	19	4	1	15	4	6	44	27.86	737.26	192.74	62.05
BDA (S)	4	1	11	6	4	1	17	15	6	9	10.53	715.77	402.00	62.08
ANG (S)	4	1	13	15	4	1	19	16	6	0	8.77	740.71	457.12	62.10
USS VANGUARD	4	1	16	0	4	1	18	55	2	54	1.34	813.02	758.13	62.10
ACN (S)	4	1	26	26	4	1	33	54	7	28	18.91	907.54	331.62	62.23
CRO (S)	4	1	57	16	4	2	5	42	8	25	39.38	964.62	218.12	62.59
GWM (S)	4	2	12	48	4	2	14	10	1	21	.31	891.00	891.00	62.66
HAW (S)	4	2	23	18	4	2	29	58	6	40	19.48	763.45	263.44	62.82
USS HUNTSVILLE	4	2	29	17	4	2	35	19	6	2	10.14	743.13	401.74	62.89
GDS (S)	4	2	33	23	4	2	39	54	6	30	20.75	758.75	239.80	62.95
PIR (S)	4	2	33	23	4	2	39	53	6	30	20.45	758.72	242.53	62.95
GYM (S)	4	2	34	52	4	2	41	31	6	38	20.97	630.27	240.29	62.96
TEX (S)	4	2	37	46	4	2	44	37	6	50	34.37	603.58	162.40	62.99
MIL (S)	4	2	41	26	4	2	47	58	6	31	16.07	778.64	307.81	63.04
GBM (S)	4	2	42	3	4	2	48	46	6	42	19.15	826.60	272.39	63.05
ANG (S)	4	2	46	31	4	2	53	38	7	6	28.42	806.41	209.28	63.08
ACN (S)	4	2	59	27	4	3	7	39	8	11	11.56	857.74	499.78	63.22
CRO (S)	4	3	32	35	4	3	37	20	4	44	3.16	977.62	800.99	63.55
GWM (S)	4	3	43	21	4	3	50	48	7	27	28.33	822.95	221.39	63.68
HAW (S)	4	3	58	16	4	4	3	15	4	59	5.00	748.43	557.76	63.83
USS HUNTSVILLE	4	4	3	24	4	4	9	32	6	7	10.24	653.60	398.53	63.90
GDS (S)	4	4	7	11	4	4	12	59	5	48	7.83	761.15	467.64	63.94
PIR (S)	4	4	7	12	4	4	12	59	5	47	7.73	762.70	470.46	63.94
GYM (S)	4	4	8	34	4	4	15	31	6	57	23.31	789.99	228.12	63.96
TEX (S)	4	4	11	38	4	4	18	0	6	22	11.28	632.19	395.40	63.98
GBM (S)	4	4	18	38	4	4	18	41	0	2	.02	851.54	851.54	64.00
USS MERCURY	4	5	15	47	4	5	20	28	4	41	3.71	750.56	662.30	64.61
GWM (S)	4	5	18	6	4	5	23	48	5	42	6.72	766.15	531.89	64.65
HAW (S)	4	5	32	42	4	5	37	30	4	47	4.37	680.36	579.20	64.83
USS HUNTSVILLE	4	5	36	56	4	5	44	1	7	4	37.77	552.65	152.59	64.89
GYM (S)	4	5	43	14	4	5	47	41	4	26	3.16	713.75	666.35	64.93
USS MERCURY	4	6	48	1	4	6	55	12	7	10	20.45	727.74	257.03	65.63
HAW (S)	4	7	5	57	4	7	12	30	6	33	14.22	669.48	325.18	65.82
USS HUNTSVILLE	4	7	10	58	4	7	17	11	6	13	9.24	760.32	453.32	65.88
USS MERCURY	4	8	22	15	4	8	28	38	6	23	11.25	748.63	383.69	66.61
HAW (S)	4	8	39	29	4	8	46	26	6	56	20.33	589.77	261.14	66.81
USS REDSTONE	4	8	56	40	4	9	0	21	3	40	1.89	847.94	847.94	66.94
USS MERCURY	4	9	56	42	4	10	2	30	5	48	7.13	495.88	481.61	67.61
USS REDSTONE	4	10	27	48	4	10	36	12	8	23	24.67	791.40	308.78	67.95
ACN (S)	4	10	54	26	4	11	1	29	7	2	9.11	958.07	570.61	68.24

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
USS MERCURY	4	11	30	21	4	11	36	57	6	36	13.15	760.89	339.36	68.63
GWM (S)	4	11	36	30	4	11	42	3	5	32	6.18	788.61	532.19	68.67
USS REDSTONE	4	12	1	29	4	12	10	7	8	37	22.14	759.76	350.67	68.95
ACN (S)	4	12	27	41	4	12	35	45	8	4	23.01	777.70	293.15	69.22
USS MERCURY	4	13	3	56	4	13	10	45	6	49	18.26	822.50	276.13	69.62
GWM (S)	4	13	9	22	4	13	16	38	7	16	32.03	570.53	189.69	69.66
USS REDSTONE	4	13	35	51	4	13	44	2	8	10	14.55	870.62	478.33	69.95
USS MERCURY	4	14	40	30	4	14	40	52	0	21	.17	835.71	835.71	70.57
USS REDSTONE	4	15	9	52	4	15	18	22	8	29	21.29	877.30	365.96	70.95
CYI (S)	4	15	40	8	4	15	46	47	6	38	11.88	801.69	394.11	71.24
MAD (S)	4	15	46	34	4	15	46	50	0	15	.11	814.27	814.27	71.24
RID (S)	4	15	46	36	4	15	46	47	0	11	.08	816.21	816.21	71.24
HSK (S)	4	16	25	45	4	16	29	46	4	1	1.92	880.41	878.41	71.69
NBE (S)	4	16	25	39	4	16	29	50	4	11	2.09	872.34	867.68	71.69
USS REDSTONE	4	16	43	38	4	16	52	23	8	45	43.82	814.63	203.56	71.94
ANG (S)	4	17	2	36	4	17	9	23	6	46	11.57	899.02	427.22	72.11
USS VANGUARD	4	17	10	14	4	17	11	16	1	2	.50	820.76	820.76	72.13
CYI (S)	4	17	13	33	4	17	20	34	7	1	30.67	608.93	181.40	72.22
MAD (S)	4	17	17	40	4	17	22	32	4	51	4.58	663.34	574.20	72.25
RID (S)	4	17	17	38	4	17	22	29	4	51	4.51	659.37	577.22	72.25
CRO (S)	4	17	49	26	4	17	55	49	6	22	7.42	791.80	610.47	72.60
HSK (S)	4	17	57	4	4	18	4	56	7	52	15.22	971.11	448.00	72.71
NBE (S)	4	17	57	2	4	18	4	57	7	55	15.81	969.15	437.60	72.71
USS REDSTONE	4	18	18	24	4	18	24	39	6	14	5.70	960.13	703.89	72.91
GBM (S)	4	18	35	16	4	18	39	23	4	6	2.62	762.90	726.56	73.06
BDA (S)	4	18	38	29	4	18	42	59	4	30	3.56	830.02	656.10	73.10
ANG (S)	4	18	36	7	4	18	43	6	6	59	13.74	770.44	357.34	73.10
USS VANGUARD	4	18	40	54	4	18	47	23	6	28	12.51	679.29	364.50	73.15
CYI (S)	4	18	47	41	4	18	54	19	6	38	16.82	622.01	283.08	73.23
MAD (S)	4	18	50	52	4	18	55	45	4	52	4.56	635.47	570.19	73.25
RID (S)	4	18	50	50	4	18	55	43	4	53	4.65	639.23	566.72	73.25
CRO (S)	4	19	21	50	4	19	30	25	8	35	42.60	797.16	202.29	73.59
HSK (S)	4	19	30	12	4	19	38	45	8	32	30.33	1008.61	277.80	73.71
NBE (S)	4	19	30	11	4	19	38	45	8	34	31.70	1006.53	268.83	73.71
TEX (S)	4	20	4	32	4	20	9	14	4	42	3.80	855.87	663.35	74.01
MIL (S)	4	20	7	0	4	20	13	49	6	49	16.65	599.82	307.47	74.05
GBM (S)	4	20	7	7	4	20	14	19	7	12	35.56	533.47	168.11	74.05
ANG (S)	4	20	12	9	4	20	15	14	3	5	1.11	769.40	752.17	74.08
BDA (S)	4	20	10	44	4	20	17	31	6	47	18.69	642.70	269.99	74.10
USS VANGUARD	4	20	14	12	4	20	21	7	6	54	19.00	730.45	259.01	74.15
CYI (S)	4	20	21	26	4	20	28	21	6	54	32.13	554.41	167.03	74.23
MAD (S)	4	20	26	8	4	20	27	0	0	51	.42	775.08	775.08	74.23
RID (S)	4	20	26	4	4	20	27	1	0	57	.46	772.84	772.84	74.23
CRO (S)	4	20	55	54	4	21	4	13	8	19	18.49	850.50	399.03	74.59
HSK (S)	4	21	3	47	4	21	12	16	8	29	21.39	852.70	363.36	74.69
NBE (S)	4	21	3	46	4	21	12	18	8	31	22.23	850.90	353.62	74.69
GYM (S)	4	21	34	25	4	21	40	38	6	12	8.20	826.56	494.44	74.96
TEX (S)	4	21	36	46	4	21	43	55	7	8	35.26	561.13	166.81	75.01
MIL (S)	4	21	40	35	4	21	47	33	6	58	28.30	816.83	191.33	75.06

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
GBM (S)	4	21	41	4	4	21	47	54	6	50	20.54	561.61	248.10	75.06
BDA (S)	4	21	44	14	4	21	51	9	6	54	20.26	731.35	244.78	75.11
USS VANGUARD	4	21	47	50	4	21	54	39	6	48	26.31	640.37	196.83	75.13
CYI (S)	4	21	55	13	4	22	1	54	6	41	17.77	579.28	276.33	75.22
CRO (S)	4	22	30	11	4	22	38	17	8	6	15.37	931.49	459.39	75.59
HSK (S)	4	22	37	58	4	22	44	48	6	50	7.49	973.42	660.54	75.68
NBE (S)	4	22	37	56	4	22	44	52	6	55	7.75	963.74	652.29	75.68
HAW (S)	4	23	0	35	4	23	0	41	0	6	.04	883.93	883.93	75.83
USS HUNTSVILLE	4	23	1	58	4	23	8	42	6	44	12.36	827.67	395.98	75.91
GDS (S)	4	23	7	34	4	23	13	9	5	35	6.82	731.07	509.83	75.96
GYM (S)	4	23	7	28	4	23	14	35	7	7	38.80	596.60	152.51	75.96
PIR (S)	4	23	7	35	4	23	13	9	5	33	6.76	731.15	511.90	75.96
TEX (S)	4	23	10	42	4	23	17	28	6	46	19.39	645.32	257.37	76.01
MIL (S)	4	23	14	36	4	23	21	13	6	37	16.17	798.26	290.04	76.06
GBM (S)	4	23	15	15	4	23	21	40	6	24	13.36	612.73	332.62	76.06
BDA (S)	4	23	17	53	4	23	24	39	6	46	22.87	649.47	212.76	76.08
ANG (S)	4	23	22	20	4	23	23	4	0	43	.37	776.04	776.04	76.08
USS VANGUARD	4	23	21	40	4	23	27	56	6	15	11.92	618.41	361.05	76.13
CRO (S)	5	0	3	59	5	0	12	36	8	36	31.42	894.13	268.94	76.59
HAW (S)	5	0	29	55	5	0	37	7	7	12	16.70	747.90	324.24	76.84
USS HUNTSVILLE	5	0	35	26	5	0	42	30	7	3	26.60	598.77	209.10	76.89
GDS (S)	5	0	40	28	5	0	46	57	6	29	13.42	796.33	333.91	76.94
PIR (S)	5	0	40	29	5	0	46	57	6	28	13.36	795.72	334.92	76.94
GYM (S)	5	0	41	32	5	0	48	9	6	37	19.00	789.22	259.41	76.96
TEX (S)	5	0	44	9	5	0	51	11	7	2	18.63	781.92	259.75	76.99
MIL (S)	5	0	48	21	5	0	55	13	6	52	63.10	795.98	102.34	77.05
GBM (S)	5	0	49	2	5	0	55	48	6	45	31.42	782.96	170.07	77.05
BDA (S)	5	0	51	57	5	0	57	39	5	41	7.25	798.14	478.60	77.07
ANG (S)	5	0	53	51	5	1	0	3	6	12	9.54	826.93	419.36	77.11
ACN (S)	5	1	6	52	5	1	14	40	7	48	24.98	824.60	260.27	77.24
CRO (S)	5	1	37	52	5	1	46	29	8	36	28.83	1017.13	294.09	77.59
GWM (S)	5	1	51	57	5	1	56	28	4	30	2.93	948.08	783.75	77.68
HAW (S)	5	2	4	6	5	2	10	47	6	41	13.89	677.47	346.29	77.83
USS HUNTSVILLE	5	2	10	8	5	2	16	6	5	57	7.96	789.97	459.90	77.91
GDS (S)	5	2	14	8	5	2	20	39	6	30	15.39	680.77	298.31	77.95
PIR (S)	5	2	14	8	5	2	20	39	6	30	15.25	681.02	300.27	77.95
GYM (S)	5	2	15	36	5	2	22	19	6	42	16.15	747.94	289.36	77.98
TEX (S)	5	2	18	27	5	2	25	29	7	1	74.81	507.18	95.12	78.00
MIL (S)	5	2	22	20	5	2	28	30	6	10	9.99	738.02	411.21	78.04
GBM (S)	5	2	22	53	5	2	29	22	6	29	13.67	589.79	336.30	78.04
ANG (S)	5	2	27	22	5	2	34	10	6	48	15.20	837.28	326.76	78.09
ACN (S)	5	2	41	16	5	2	48	4	6	48	8.68	979.03	565.97	78.23
CRO (S)	5	3	13	50	5	3	17	27	3	36	1.75	991.62	899.31	78.54
GWM (S)	5	3	24	6	5	3	31	50	7	44	75.65	495.00	119.86	78.67
HAW (S)	5	3	39	17	5	3	44	7	4	50	4.46	787.75	582.13	78.83
USS HUNTSVILLE	5	3	44	19	5	3	50	26	6	7	9.91	727.23	401.21	78.90
GDS (S)	5	3	48	15	5	3	53	32	5	17	5.45	568.84	533.96	78.93
PIR (S)	5	3	48	15	5	3	53	32	5	16	5.36	571.43	536.89	78.93
GYM (S)	5	3	49	26	5	3	56	8	6	41	17.96	799.17	269.05	78.97

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
TEX (S)	5	3	52	46	5	3	58	27	5	41	7.29	755.64	489.13	78.99
USS MERCURY	5	4	56	4	5	5	1	55	5	51	5.72	614.67	599.05	79.61
GWM (S)	5	4	59	18	5	5	4	34	5	15	5.11	769.59	607.62	79.66
HAW (S)	5	5	13	39	5	5	18	36	4	57	5.06	736.61	546.90	79.83
USS HUNTSVILLE	5	5	18	2	5	5	24	55	6	52	28.46	797.67	186.64	79.90
GYM (S)	5	5	25	2	5	5	27	42	2	39	1.43	739.14	739.14	79.92
USS MERCURY	5	6	28	55	5	6	36	16	7	20	30.43	783.13	198.34	80.63
HAW (S)	5	6	46	57	5	6	53	40	6	43	20.12	582.58	244.06	80.82
USS HUNTSVILLE	5	6	52	21	5	6	57	46	5	25	5.16	572.40	562.65	80.86
USS MERCURY	5	8	3	27	5	8	9	50	6	23	11.03	729.62	395.62	81.61
HAW (S)	5	8	20	50	5	8	27	20	6	29	13.44	589.34	343.59	81.81
USS REDSTONE	5	8	37	8	5	8	42	9	5	0	3.71	953.52	754.46	81.96
USS MERCURY	5	9	37	58	5	9	43	49	5	51	7.59	798.28	467.56	82.61
USS REDSTONE	5	10	8	55	5	10	17	28	8	32	26.31	728.15	295.12	82.95
ACN (S)	5	10	35	16	5	10	43	12	7	56	13.49	888.01	482.65	83.24
USS MERCURY	5	11	11	41	5	11	18	20	6	38	14.93	747.81	304.74	83.63
GWM (S)	5	11	17	40	5	11	23	38	5	58	8.53	735.00	445.66	83.67
USS REDSTONE	5	11	42	52	5	11	51	27	8	35	19.51	765.25	390.78	83.95
ACN (S)	5	12	9	2	5	12	17	6	8	3	17.32	810.00	384.09	84.22
USS MERCURY	5	12	45	32	5	12	51	58	6	25	12.71	707.74	348.05	84.60
GWM (S)	5	12	50	58	5	12	57	53	6	54	18.48	612.64	283.93	84.65
USS REDSTONE	5	13	17	17	5	13	25	35	8	18	15.28	889.26	475.45	84.95
CYI (S)	5	13	50	2	5	13	52	53	2	50	1.21	822.31	822.31	85.22
USS REDSTONE	5	14	51	17	5	15	0	2	8	44	26.62	900.05	321.39	85.95
CYI (S)	5	15	21	29	5	15	28	37	7	8	15.83	780.35	330.26	86.24
MAD (S)	5	15	27	14	5	15	30	1	2	47	1.23	767.21	767.21	86.24
RID (S)	5	15	27	13	5	15	29	52	2	38	1.21	768.37	768.37	86.24
HSK (S)	5	16	6	42	5	16	11	52	5	9	3.54	810.24	799.31	86.69
NBE (S)	5	16	6	37	5	16	11	55	5	17	3.73	799.39	791.04	86.69
USS REDSTONE	5	16	25	10	5	16	34	1	8	50	41.28	874.62	224.30	86.94
ANG (S)	5	16	43	55	5	16	51	24	7	29	20.09	919.91	309.12	87.10
USS VANGUARD	5	16	50	34	5	16	54	27	3	53	2.41	806.28	742.94	87.14
CYI (S)	5	16	55	16	5	17	2	19	7	2	19.60	757.01	269.42	87.24
MAD (S)	5	16	55	10	5	17	4	18	5	8	5.45	759.22	546.49	87.27
RID (S)	5	16	59	7	5	17	4	15	5	7	5.41	766.17	548.21	87.27
CRO (S)	5	17	30	46	5	17	37	44	6	58	10.52	700.92	509.74	87.59
HSK (S)	5	17	38	34	5	17	46	44	8	9	17.11	902.68	417.37	87.71
NBE (S)	5	17	38	32	5	17	46	44	8	12	17.78	900.56	407.05	87.71
USS REDSTONE	5	18	0	24	5	18	6	2	5	37	4.13	992.37	789.61	87.92
MIL (S)	5	18	16	59	5	18	20	38	3	38	1.83	812.86	795.98	88.05
GBM (S)	5	18	16	14	5	18	21	48	5	33	4.83	660.18	640.69	88.05
BDA (S)	5	18	19	41	5	18	25	12	5	31	5.76	827.53	588.85	88.10
ANG (S)	5	18	18	2	5	18	24	54	6	52	13.35	900.46	382.23	88.10
USS VANGUARD	5	18	22	26	5	18	29	20	6	53	17.76	569.65	294.58	88.14
CYI (S)	5	18	29	33	5	18	36	5	6	31	13.38	787.94	337.64	88.24
MAD (S)	5	18	32	42	5	18	37	20	4	38	2.44	618.55	614.96	88.24
RID (S)	5	18	32	39	5	18	37	19	4	39	2.55	617.19	613.73	88.24
CRO (S)	5	19	3	41	5	19	12	10	8	29	61.52	991.78	158.15	88.61
HSK (S)	5	19	11	57	5	19	20	38	8	41	31.88	998.98	273.27	88.71

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
NBE (S)	5	19	11	56	5	19	20	39	8	43	33.34	996.51	264.33	88.71
TEX (S)	5	19	45	46	5	19	51	37	5	51	6.21	863.06	593.68	89.00
MIL (S)	5	19	48	37	5	19	55	49	7	12	23.47	596.02	247.80	89.05
GBM (S)	5	19	48	51	5	19	56	13	7	22	31.11	796.58	197.41	89.07
ANG (S)	5	19	54	44	5	19	56	45	2	0	.96	775.93	775.93	89.07
BDA (S)	5	19	52	24	5	19	59	31	7	6	28.41	515.00	199.80	89.10
USS VANGUARD	5	19	56	5	5	20	3	6	7	0	37.76	586.53	150.95	89.15
CYI (S)	5	20	3	24	5	20	10	10	6	46	21.87	768.52	226.03	89.24
CRO (S)	5	20	37	55	5	20	46	6	8	10	18.69	1027.05	400.87	89.61
HSK (S)	5	20	45	38	5	20	54	6	8	27	21.80	1026.26	370.97	89.70
NBE (S)	5	20	45	37	5	20	54	8	8	30	22.66	1020.46	361.02	89.70
USS HUNTSVILLE	5	21	13	19	5	21	14	38	1	19	.61	878.96	878.96	89.89
GYM (S)	5	21	16	4	5	21	22	57	6	53	13.97	678.12	370.68	89.97
TEX (S)	5	21	18	33	5	21	25	55	7	21	47.27	564.70	140.07	90.00
MIL (S)	5	21	22	27	5	21	29	36	7	8	36.32	514.46	161.35	90.05
GBM (S)	5	21	23	5	5	21	29	51	6	46	16.21	661.58	306.79	90.05
BDA (S)	5	21	26	11	5	21	33	13	7	2	49.86	555.77	121.02	90.10
USS VANGUARD	5	21	29	56	5	21	36	42	6	45	22.25	790.25	223.61	90.15
CYI (S)	5	21	37	24	5	21	43	37	6	12	11.37	678.44	367.48	90.21
CRO (S)	5	22	12	10	5	22	20	27	8	16	17.05	967.77	439.74	90.61
HSK (S)	5	22	20	1	5	22	26	36	6	34	6.31	1040.41	723.42	90.67
NBE (S)	5	22	20	0	5	22	26	40	6	40	6.60	1037.33	712.82	90.67
HAW (S)	5	22	39	57	5	22	44	18	4	21	2.82	924.06	767.03	90.84
USS HUNTSVILLE	5	22	43	47	5	22	51	6	7	18	20.23	862.07	287.30	90.90
GDS (S)	5	22	49	18	5	22	55	26	6	8	8.96	731.84	463.12	90.95
PIR (S)	5	22	49	19	5	22	55	26	6	7	8.86	734.87	465.87	90.95
GYM (S)	5	22	49	34	5	22	56	48	7	13	24.73	771.21	223.44	90.97
TEX (S)	5	22	52	42	5	22	59	36	6	53	20.82	575.88	249.95	91.00
MIL (S)	5	22	56	35	5	23	3	25	6	49	23.18	524.17	220.11	91.05
GBM (S)	5	22	57	23	5	23	3	47	6	24	12.62	692.09	348.10	91.05
BDA (S)	5	23	0	5	5	23	6	47	6	42	21.89	645.32	225.63	91.10
ANG (S)	5	23	3	44	5	23	6	17	2	32	.55	764.89	759.44	91.10
USS VANGUARD	5	23	4	0	5	23	9	42	5	42	7.45	787.16	463.46	91.12
CRO (S)	5	23	46	2	5	23	54	57	8	55	38.24	848.06	241.24	91.60
HAW (S)	6	0	11	57	6	0	19	31	7	33	42.24	897.83	161.83	91.83
USS HUNTSVILLE	6	0	17	41	6	0	24	44	7	3	17.61	803.71	295.71	91.90
GDS (S)	6	0	22	28	6	0	29	18	6	49	21.11	553.13	242.93	91.95
PIR (S)	6	0	22	28	6	0	29	18	6	49	20.84	552.97	245.36	91.95
GYM (S)	6	0	23	50	6	0	30	27	6	37	14.00	788.62	326.38	91.98
TEX (S)	6	0	26	50	6	0	33	33	6	43	20.01	574.17	245.58	92.00
MIL (S)	6	0	30	25	6	0	37	22	6	57	68.96	516.97	96.31	92.05
GBM (S)	6	0	31	6	6	0	37	56	6	50	31.27	611.20	167.85	92.05
BDA (S)	6	0	34	22	6	0	39	26	5	3	4.72	585.54	558.65	92.07
ANG (S)	6	0	35	58	6	0	42	23	6	24	12.25	781.27	353.96	92.11
ACN (S)	6	0	49	2	6	0	56	47	7	44	29.37	775.17	216.53	92.23
CRO (S)	6	1	20	5	6	1	28	24	8	19	20.60	939.08	378.23	92.59
GWM (S)	6	1	33	19	6	1	39	15	5	56	5.89	861.01	664.41	92.68
HAW (S)	6	1	46	18	6	1	52	52	6	34	11.86	673.95	392.38	92.83
USS HUNTSVILLE	6	1	52	18	6	1	58	17	5	58	8.29	757.67	453.64	92.90

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
GDS (S)	6	1	56	13	6	2	2	41	6	27	14.66	669.30	307.51	92.95
PIR (S)	6	1	56	14	6	2	2	40	6	26	14.51	669.81	309.78	92.95
GYM (S)	6	1	57	45	6	2	4	29	6	44	17.99	748.92	263.09	92.97
TEX (S)	6	2	0	35	6	2	7	32	6	56	57.78	493.05	105.76	93.00
MIL (S)	6	2	4	41	6	2	10	14	5	32	6.90	771.17	484.76	93.04
CBM (S)	6	2	5	15	6	2	11	8	5	52	8.96	657.90	425.10	93.04
ANG (S)	6	2	9	47	6	2	15	56	6	8	9.22	760.65	432.23	93.07
ACN (S)	6	2	23	55	6	2	29	40	5	44	5.11	891.77	670.84	93.20
GWM (S)	6	3	6	5	6	3	13	53	7	47	53.51	506.02	147.05	93.66
HAW (S)	6	3	21	27	6	3	26	12	4	45	4.26	775.62	594.77	93.83
USS HUNTSVILLE	6	3	26	20	6	3	32	36	6	15	11.63	688.23	360.35	93.90
GDS (S)	6	3	30	31	6	3	35	11	4	40	3.88	624.80	589.93	93.92
PIR (S)	6	3	30	32	6	3	35	10	4	38	3.81	627.52	592.88	93.92
GYM (S)	6	3	31	36	6	3	37	59	6	22	13.30	711.92	328.11	93.95
TEX (S)	6	3	35	12	6	3	39	57	4	44	4.36	671.44	580.02	93.96
USS MERCURY	6	4	37	34	6	4	44	12	6	38	8.93	843.34	516.69	94.63
GWM (S)	6	4	41	41	6	4	46	15	4	34	3.41	841.08	691.09	94.66
HAW (S)	6	4	55	34	6	5	0	47	5	12	5.87	723.75	514.82	94.83
USS HUNTSVILLE	6	5	0	2	6	5	6	48	6	46	26.87	646.00	190.38	94.89
USS MERCURY	6	6	10	46	6	6	18	11	7	24	31.60	808.90	196.83	95.63
HAW (S)	6	6	28	48	6	6	35	37	6	48	29.63	542.76	173.76	95.82
USS HUNTSVILLE	6	6	34	46	6	6	39	1	4	14	2.90	679.41	644.34	95.86
USS MERCURY	6	7	45	20	6	7	51	42	6	21	10.51	721.43	412.69	96.61
HAW (S)	6	8	2	58	6	8	8	44	5	46	8.26	690.87	446.68	96.81
USS REDSTONE	6	8	18	29	6	8	24	12	5	42	5.23	922.12	667.16	96.96
ACN (S)	6	8	45	23	6	8	48	15	2	51	.86	1004.91	980.61	97.23
USS MERCURY	6	9	19	42	6	9	25	42	5	59	8.76	754.77	435.00	97.61
USS REDSTONE	6	9	50	40	6	9	59	5	8	25	36.07	781.77	214.53	97.96
ACN (S)	6	10	16	43	6	10	25	5	8	21	17.28	784.45	417.71	98.24
USS MERCURY	6	10	53	18	6	11	0	0	6	42	22.62	650.40	217.84	98.61
GWM (S)	6	10	59	9	6	11	5	30	6	20	12.93	626.23	337.03	98.67
USS REDSTONE	6	11	24	40	6	11	32	57	8	16	18.57	846.51	384.72	98.96
ACN (S)	6	11	50	48	6	11	58	26	7	37	12.98	880.18	478.73	99.22
USS MERCURY	6	12	27	20	6	12	33	18	5	58	9.77	665.39	400.72	99.60
GWM (S)	6	12	32	50	6	12	39	10	6	19	11.41	630.32	384.04	99.65
USS REDSTONE	6	12	58	56	6	13	7	7	8	11	13.66	833.71	493.30	99.96
CYI (S)	6	13	30	44	6	13	35	18	4	34	2.78	765.72	748.96	100.23
USS REDSTONE	6	14	32	45	6	14	41	36	8	51	24.63	770.06	335.03	100.95
ANG (S)	6	14	54	9	6	14	56	32	2	22	.68	914.09	914.09	101.10
CYI (S)	6	15	2	43	6	15	10	5	7	22	26.45	837.83	232.67	101.25
MAD (S)	6	15	7	54	6	15	11	43	3	48	2.48	840.35	708.20	101.25
RID (S)	6	15	7	52	6	15	11	38	3	45	2.43	837.60	710.90	101.25
HSK (S)	6	15	47	44	6	15	53	22	5	38	4.97	888.94	701.79	101.69
NBE (S)	6	15	47	40	6	15	53	25	5	44	5.24	878.46	691.32	101.69
USS REDSTONE	6	16	6	36	6	16	15	21	8	45	22.28	748.62	358.82	101.94
ANG (S)	6	16	24	59	6	16	32	54	7	54	20.67	742.81	306.29	102.11
USS VANGUARD	6	16	31	12	6	16	36	19	5	6	4.53	824.97	651.97	102.15
CYI (S)	6	16	36	38	6	16	43	46	7	8	26.64	575.60	213.12	102.23
MAD (S)	6	16	40	23	6	16	45	39	5	15	4.75	589.74	576.09	102.25

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
RID (S)	6	16	40	21	6	16	45	36	5	15	4.77	586.16	580.04	102.25
CRO (S)	6	17	12	0	6	17	19	9	7	9	12.71	885.29	442.63	102.60
HSK (S)	6	17	19	56	6	17	27	55	7	58	19.78	943.50	365.93	102.69
NBE (S)	6	17	19	54	6	17	27	55	8	1	20.55	937.75	356.45	102.69
USS REDSTONE	6	17	42	19	6	17	46	32	4	13	2.32	943.67	884.54	102.91
MIL (S)	6	17	57	25	6	18	2	34	5	9	4.49	832.86	675.64	103.06
GBM (S)	6	17	57	1	6	18	3	28	6	26	8.83	751.84	520.42	103.06
ANG (S)	6	17	59	25	6	18	6	2	6	36	9.56	799.45	486.18	103.08
BDA (S)	6	18	0	34	6	18	6	47	6	12	8.38	729.72	506.42	103.10
USS VANGUARD	6	18	3	37	6	18	10	41	7	3	16.70	796.69	311.90	103.15
CYI (S)	6	18	10	48	6	18	17	33	6	44	18.57	585.18	265.76	103.23
MAD (S)	6	18	13	59	6	18	18	28	4	29	3.89	758.50	597.63	103.25
RID (S)	6	18	13	56	6	18	18	26	4	30	3.95	791.19	595.09	103.25
CRO (S)	6	18	44	59	6	18	53	23	8	24	25.52	722.22	291.24	103.60
HSK (S)	6	18	53	8	6	19	1	45	8	36	26.36	818.64	308.71	103.69
NBE (S)	6	18	53	7	6	19	1	45	8	38	27.33	816.03	300.64	103.69
GYM (S)	6	19	25	47	6	19	28	32	2	45	.82	901.28	864.63	103.96
TEX (S)	6	19	26	33	6	19	33	10	6	36	10.11	679.52	477.52	104.01
MIL (S)	6	19	29	45	6	19	37	11	7	25	28.64	845.80	213.56	104.06
GBM (S)	6	19	30	6	6	19	37	35	7	29	73.93	511.76	111.55	104.06
BDA (S)	6	19	33	33	6	19	40	45	7	11	21.60	776.12	251.66	104.11
USS VANGUARD	6	19	37	11	6	19	44	14	7	2	24.84	766.22	218.58	104.16
CYI (S)	6	19	44	35	6	19	51	31	6	56	69.67	494.85	95.22	104.23
CRO (S)	6	20	19	12	6	20	27	15	8	2	14.10	824.11	471.78	104.60
HSK (S)	6	20	26	49	6	20	35	8	8	19	15.66	819.24	456.14	104.69
NBE (S)	6	20	26	48	6	20	35	11	8	22	16.09	811.91	448.78	104.69
USS HUNTSVILLE	6	20	52	56	6	20	57	5	4	8	2.11	816.28	802.97	104.89
GDS (S)	6	20	58	54	6	21	1	31	2	37	1.30	810.72	810.72	104.93
PIR (S)	6	20	58	56	6	21	1	30	2	33	1.26	812.91	812.91	104.93
GYM (S)	6	20	56	53	6	21	4	7	7	14	17.99	843.48	322.31	104.96
TEX (S)	6	20	59	42	6	21	7	2	7	19	82.92	826.35	107.08	105.00
MIL (S)	6	21	3	42	6	21	10	43	7	0	31.15	856.29	185.98	105.04
GBM (S)	6	21	4	22	6	21	11	4	6	41	16.70	850.57	303.09	105.07
BDA (S)	6	21	7	23	6	21	14	22	6	59	56.27	832.17	113.88	105.09
USS VANGUARD	6	21	11	2	6	21	17	48	6	46	18.73	637.86	267.32	105.14
CYI (S)	6	21	18	58	6	21	24	16	5	17	4.85	679.32	611.29	105.20
CRO (S)	6	21	53	0	6	22	4	12	11	11	33.73	1022.05	403.36	105.61
HSK (S)	6	22	1	37	6	22	9	9	7	32	6.07	1157.77	966.74	105.67
NBE (S)	6	22	1	35	6	22	9	13	7	38	6.28	1187.01	958.35	105.67
HAW (S)	6	22	20	53	6	22	28	33	7	40	13.16	709.70	496.15	105.83
USS HUNTSVILLE	6	22	26	8	6	22	34	13	8	5	47.38	849.30	161.51	105,90
GDS (S)	6	22	31	38	6	22	38	29	6	50	14.09	671.78	365.44	105.95
PIR (S)	6	22	31	39	6	22	38	29	6	50	13.93	674.59	368.30	105.95
GYM (S)	6	22	32	29	6	22	39	44	7	15	23.41	826.17	240.06	105.97
TEX (S)	6	22	35	41	6	22	42	35	6	53	18.67	628.75	276.85	106.00
MIL (S)	6	22	39	27	6	22	46	29	7	1	34.72	538.70	161.54	106.05
GBM (S)	6	22	40	14	6	22	46	57	6	42	15.91	758.65	301.34	106.07
BDA (S)	6	22	43	0	6	22	49	33	6	32	13.49	699.80	343.54	106.09
ANG (S)	6	22	45	31	6	22	50	49	5	17	5.17	620.39	575.83	106.09

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
USS VANGUARD	6	22	47	23	6	22	51	54	4	30	3.30	708.96	655.16	106.11
ACN (S)	6	22	58	33	6	23	6	10	7	37	11.26	900.88	553.18	106.24
CRO (S)	6	23	28	53	6	23	40	11	11	18	72.85	967.47	242.47	106.60
GWM (S)	6	23	45	36	6	23	48	7	2	31	.93	1097.11	1097.11	106.67
HAW (S)	6	23	56	12	7	0	4	17	8	4	38.70	872.49	190.71	106.83
USS HUNTSVILLE	7	0	2	29	7	0	9	22	6	52	12.76	838.67	380.89	106.90
GDS (S)	7	0	7	2	7	0	13	52	6	49	19.70	608.74	259.46	106.95
PIR (S)	7	0	7	3	7	0	13	52	6	49	19.48	608.81	261.69	106.95
GYM (S)	7	0	8	30	7	0	15	18	6	48	15.44	771.45	308.68	106.98
TEX (S)	7	0	11	25	7	0	18	28	7	2	38.43	522.85	148.70	107.00
MIL (S)	7	0	15	6	7	0	22	3	6	57	22.68	605.29	235.91	107.04
GBM (S)	7	0	15	41	7	0	22	45	7	4	30.09	580.61	187.40	107.04
BDA (S)	7	0	20	6	7	0	22	56	2	49	1.18	849.02	772.61	107.06
ANG (S)	7	0	20	8	7	0	27	45	7	36	24.17	739.63	242.65	107.10
ACN (S)	7	0	33	16	7	0	42	35	9	18	25.09	809.22	357.76	107.23
CRO (S)	7	1	5	21	7	1	14	38	9	16	12.71	1028.37	694.96	107.56
GWM (S)	7	1	17	54	7	1	26	48	8	54	25.42	961.25	345.89	107.67
HAW (S)	7	1	33	5	7	1	39	10	6	5	7.57	776.80	514.10	107.83
USS HUNTSVILLE	7	1	38	52	7	1	44	58	6	6	8.53	787.85	450.50	107.91
GDS (S)	7	1	42	44	7	1	48	45	6	0	8.38	796.17	450.15	107.93
PIR (S)	7	1	42	45	7	1	48	44	5	59	8.27	798.05	453.03	107.93
GYM (S)	7	1	44	1	7	1	51	3	7	1	27.72	796.33	194.77	107.97
TEX (S)	7	1	47	6	7	1	53	53	6	46	15.76	659.94	318.70	107.99
MIL (S)	7	1	52	5	7	1	55	32	3	27	1.48	799.65	769.57	108.01
GBM (S)	7	1	52	28	7	1	56	36	4	8	2.76	803.20	726.90	108.01
ANG (S)	7	1	56	51	7	2	1	49	4	58	3.64	844.37	741.63	108.07
ACN (S)	7	2	10	44	7	2	17	9	6	25	4.07	1178.15	953.34	108.22
USS MERCURY	7	2	52	29	7	2	58	0	5	31	4.04	1029.88	830.00	108.62
GWM (S)	7	2	54	4	7	3	2	2	7	57	15.45	911.20	424.41	108.67
HAW (S)	7	3	9	48	7	3	14	46	4	57	4.57	676.88	584.29	108.81
GDS (S)	7	3	20	13	7	3	21	27	1	14	.64	789.22	789.22	108.90
USS HUNTSVILLE	7	3	14	21	7	3	21	13	6	52	16.97	760.12	286.96	108.90
PIR (S)	7	3	20	16	7	3	21	24	1	8	.59	792.33	792.33	108.90
GYM (S)	7	3	20	7	7	3	25	45	5	38	6.60	725.76	539.40	108.94
USS MERCURY	7	4	26	32	7	4	34	39	8	7	35.48	968.69	217.63	109.62
HAW (S)	7	4	45	9	7	4	51	32	6	22	11.62	698.71	374.64	109.84
USS HUNTSVILLE	7	4	49	54	7	4	56	39	6	45	14.58	646.12	341.13	109.88
USS MERCURY	7	6	2	36	7	6	9	59	7	22	20.47	894.27	287.23	110.62
HAW (S)	7	6	20	25	7	6	27	35	7	10	18.21	737.58	296.48	110.83
USS REDSTONE	7	6	37	54	7	6	41	41	3	46	1.45	1032.03	988.24	110.95
ACN (S)	7	7	3	10	7	7	7	23	4	13	1.56	1239.96	1204.77	111.24
USS MERCURY	7	7	39	4	7	7	45	19	6	15	9.61	728.08	431.91	111.63
HAW (S)	7	7	57	58	7	8	0	52	2	53	1.25	918.78	821.30	111.79
USS REDSTONE	7	8	10	11	7	8	20	0	9	48	29.17	999.29	362.56	111.97
ACN (S)	7	8	36	55	7	8	46	30	9	35	13.21	952.80	691.04	112.24
USS MERCURY	7	9	14	52	7	9	21	27	6	35	14.52	700.42	320.58	112.63
GWM (S)	7	9	21	13	7	9	26	19	5	6	4.31	640.67	604.92	112.67
USS REDSTONE	7	9	45	23	7	9	56	8	10	44	46.58	1019.18	287.36	112.97
ACN (S)	7	10	12	14	7	10	22	42	10	27	39.29	1141.46	313.98	113.23

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
USS MERCURY	7	10	50	13	7	10	57	12	6	59	19.14	785.75	267.06	113.62
GWM (S)	7	10	55	34	7	11	3	15	7	40	41.91	860.55	162.24	113.68
USS REDSTONE	7	11	21	25	7	11	32	12	10	46	26.57	1040.84	462.97	113.97
ACN (S)	7	11	50	7	7	11	56	2	5	55	4.20	1076.10	911.05	114.19
CYI (S)	7	11	56	43	7	11	59	10	2	26	.46	1062.04	1012.46	114.23
USS MERCURY	7	12	27	37	7	12	30	27	2	50	1.54	782.42	782.42	114.57
GWM (S)	7	12	32	50	7	12	36	55	4	5	2.23	981.04	833.87	114.64
USS REDSTONE	7	12	57	23	7	13	8	32	11	9	33.99	994.44	398.71	114.96
CYI (S)	7	13	29	16	7	13	37	3	7	46	15.83	881.58	421.46	115.25
MAD (S)	7	13	35	45	7	13	37	51	2	5	1.03	860.03	860.03	115.25
RID (S)	7	13	35	45	7	13	37	47	2	1	.98	862.67	862.67	115.25
HSK (S)	7	14	14	53	7	14	21	12	6	19	4.24	1159.22	937.80	115.71
NBE (S)	7	14	14	48	7	14	21	14	6	26	4.42	1154.76	927.23	115.71
USS REDSTONE	7	14	33	10	7	14	44	32	11	22	75.93	953.34	241.72	115.95
ANG (S)	7	14	53	3	7	15	1	37	8	34	15.54	874.36	508.01	116.11
USS VANGUARD	7	15	0	19	7	15	4	18	3	59	2.13	968.95	874.35	116.13
CYI (S)	7	15	4	50	7	15	12	34	7	44	61.31	502.52	131.84	116.23
MAD (S)	7	15	9	5	7	15	14	23	5	18	4.49	644.70	630.91	116.25
RID (S)	7	15	9	2	7	15	14	20	5	18	4.55	642.17	635.24	116.25
CRO (S)	7	15	40	45	7	15	48	26	7	40	9.38	1025.37	683.26	116.60
HSK (S)	7	15	48	12	7	15	58	9	9	57	20.90	1049.09	506.05	116.71
NBE (S)	7	15	48	10	7	15	58	10	9	59	21.54	1041.85	496.24	116.71
USS REDSTONE	7	16	9	35	7	16	19	4	9	29	13.82	1173.01	679.97	116.94
MIL (S)	7	16	28	13	7	16	32	18	4	5	2.09	1003.83	919.04	117.04
GBM (S)	7	16	27	25	7	16	33	37	6	12	5.63	883.61	753.14	117.06
BCA (S)	7	16	31	3	7	16	37	0	5	56	5.18	913.90	709.37	117.11
ANG (S)	7	16	28	40	7	16	37	3	8	23	29.26	1039.58	277.25	117.11
USS VANGUARD	7	16	33	46	7	16	41	6	7	20	13.21	831.47	439.41	117.16
CYI (S)	7	16	40	57	7	16	47	58	7	1	20.58	598.34	262.24	117.23
MAD (S)	7	16	44	13	7	16	49	18	5	5	5.22	742.82	565.65	117.26
RID (S)	7	16	44	10	7	16	49	16	5	6	5.25	741.61	564.67	117.26
CRO (S)	7	17	14	54	7	17	25	8	10	13	41.50	1186.23	280.02	117.62
HSK (S)	7	17	23	7	7	17	34	4	10	57	37.65	1052.46	356.17	117.71
NBE (S)	7	17	23	6	7	17	34	5	10	58	38.86	1050.29	348.47	117.71
TEX (S)	7	17	58	37	7	18	5	11	6	34	6.17	1045.31	709.94	118.02
MIL (S)	7	18	1	29	7	18	9	27	7	57	16.69	798.84	404.62	118.06
GBM (S)	7	18	1	39	7	18	9	59	8	19	26.61	789.62	269.23	118.06
ANG (S)	7	18	6	18	7	18	11	21	5	2	4.03	878.44	707.69	118.09
BCA (S)	7	18	5	25	7	18	12	58	7	32	20.40	842.21	311.73	118.11
USS VANGUARD	7	18	9	7	7	18	16	34	7	27	43.62	540.23	153.04	118.14
RID (S)	7	18	20	49	7	18	20	59	0	9	.03	805.10	805.10	118.21
CYI (S)	7	18	16	46	7	18	23	40	6	54	24.90	816.07	210.39	118.24
CRO (S)	7	18	50	35	7	19	1	7	10	32	27.73	1232.65	420.52	118.62
HSK (S)	7	18	58	34	7	19	9	35	11	0	29.41	1220.10	440.40	118.71
NBE (S)	7	18	58	34	7	19	9	36	11	2	30.29	1219.24	431.61	118.71
USS HUNTSVILLE	7	19	27	14	7	19	30	14	3	0	1.24	1016.76	1016.76	118.89
GYM (S)	7	19	30	34	7	19	38	15	7	41	13.83	1009.46	465.69	118.97
TEX (S)	7	19	33	7	7	19	41	16	8	8	31.58	812.89	239.38	119.02
MIL (S)	7	19	37	6	7	19	44	47	7	40	45.92	572.38	158.53	119.04

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - *Continued*

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
GBM (S)	7	19	37	39	7	19	45	9	7	30	19.93	788.88	305.07	119.07
BDA (S)	7	19	41	1	7	19	48	24	7	23	63.22	491.05	115.53	119.09
USS VANGUARD	7	19	44	53	7	19	51	55	7	1	32.90	592.49	171.28	119.14
CYI (S)	7	19	52	21	7	19	58	53	6	32	13.41	825.14	339.78	119.23
CRO (S)	7	20	26	37	7	20	37	22	10	45	23.09	1207.90	517.81	119.62
HSK (S)	7	20	34	27	7	20	44	16	9	48	14.34	1230.88	699.12	119.68
NBE (S)	7	20	34	27	7	20	44	19	9	52	14.69	1229.29	690.50	119.68
HAW (S)	7	20	55	53	7	21	1	24	5	31	3.81	1014.02	891.35	119.84
USS HUNTSVILLE	7	20	59	51	7	21	8	10	8	19	18.77	886.57	385.56	119.90
GDS (S)	7	21	5	44	7	21	12	23	6	39	9.08	787.44	538.20	119.95
PIR (S)	7	21	5	45	7	21	12	23	6	38	8.99	790.52	540.89	119.95
GYM (S)	7	21	5	47	7	21	13	51	8	3	30.77	767.52	220.23	119.97
TEX (S)	7	21	9	6	7	21	16	34	7	27	28.98	559.77	218.22	120.00
MIL (S)	7	21	13	9	7	21	20	17	7	7	26.64	522.63	212.30	120.05
GBM (S)	7	21	13	53	7	21	20	38	6	44	14.45	683.82	340.17	120.05
BDA (S)	7	21	16	47	7	21	23	41	6	54	24.41	827.75	215.35	120.10
ANG (S)	7	21	20	31	7	21	22	54	2	22	.52	799.85	779.14	120.10
USS VANGUARD	7	21	20	38	7	21	26	43	6	4	9.01	777.73	432.01	120.12
CRO (S)	7	22	2	23	7	22	13	44	11	21	40.33	1199.07	350.97	120.61
HSK (S)	7	22	12	32	7	22	16	6	3	33	1.22	1257.74	1200.63	120.63
NBE (S)	7	22	12	27	7	22	16	17	3	50	1.40	1250.96	1191.16	120.63
HAW (S)	7	22	29	34	7	22	38	20	8	45	29.54	833.77	277.33	120.83
USS HUNTSVILLE	7	22	35	29	7	22	43	32	8	2	23.20	744.67	297.78	120.91
GDS (S)	7	22	40	48	7	22	47	55	7	6	19.24	909.17	289.91	120.96
PIR (S)	7	22	40	49	7	22	47	55	7	6	19.06	911.39	291.92	120.96
GYM (S)	7	22	41	54	7	22	49	3	7	8	17.52	784.66	312.47	120.98
TEX (S)	7	22	45	9	7	22	52	7	6	57	21.95	557.08	242.00	121.01
MIL (S)	7	22	48	55	7	22	55	55	7	0	40.43	590.13	141.76	121.05
GBM (S)	7	22	49	30	7	22	56	32	7	1	40.51	545.81	141.53	121.05
BDA (S)	7	22	52	41	7	22	58	15	5	34	6.72	782.23	499.74	121.07
ANG (S)	7	22	54	25	7	23	0	50	6	24	11.48	731.32	378.57	121.09
ACN (S)	7	23	7	18	7	23	15	55	8	36	33.83	851.78	239.44	121.24
CRO (S)	7	23	38	14	7	23	49	12	10	58	29.31	1183.29	429.78	121.60
GWM (S)	7	23	52	16	7	23	59	56	7	39	7.84	1112.52	769.85	121.68
HAW (S)	8	0	5	43	8	0	13	26	7	43	15.06	782.73	406.26	121.84
USS HUNTSVILLE	8	0	12	2	8	0	18	40	6	38	10.84	757.26	437.15	121.89
GDS (S)	8	0	16	16	8	0	22	54	6	37	12.36	793.89	352.44	121.96
GYM (S)	8	0	17	44	8	0	24	43	6	58	27.19	615.65	199.31	121.96
PIR (S)	8	0	16	17	8	0	22	54	6	37	12.20	794.13	355.22	121.96
TEX (S)	8	0	20	51	8	0	27	48	6	56	32.87	620.45	166.89	122.00
MIL (S)	8	0	24	46	8	0	30	43	5	56	7.94	796.06	464.80	122.02
GBM (S)	8	0	25	18	8	0	31	38	6	19	11.10	696.23	392.65	122.04
ANG (S)	8	0	29	40	8	0	36	37	6	56	15.93	608.66	331.62	122.08
ACN (S)	8	0	43	14	8	0	51	18	8	3	11.69	1070.11	589.12	122.23
CRO (S)	8	1	15	37	8	1	22	30	6	52	5.14	1117.72	979.76	122.55
GWM (S)	8	1	26	55	8	1	36	19	9	24	34.72	728.95	269.70	122.67
HAW (S)	8	1	42	48	8	1	48	23	5	35	5.30	896.89	612.52	122.82
USS HUNTSVILLE	8	1	48	4	8	1	54	33	6	29	12.36	695.78	365.28	122.89
GDS (S)	8	1	52	15	8	1	57	21	5	6	5.51	723.38	538.90	122.93

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
PIR (S)	8	1	52	16	8	1	57	21	5	4	5.42	725.57	541.99	122.93
GYM (S)	8	1	53	22	8	2	0	9	6	46	20.34	560.25	247.83	122.96
TEX (S)	8	1	56	54	8	2	2	16	5	21	5.55	617.70	549.74	122.97
ACN (S)	8	2	22	38	8	2	23	49	1	11	.22	1152.74	1152.74	123.18
USS MERCURY	8	3	0	20	8	3	8	14	7	53	12.47	1019.64	5[illegible].88	123.63
GWM (S)	8	3	4	3	8	3	10	39	6	36	6.87	920.56	675.36	123.65
HAW (S)	8	3	19	1	8	3	24	26	5	25	5.31	567.34	561.01	123.82
USS HUNTSVILLE	8	3	23	27	8	3	30	31	7	4	68.22	518.79	100.43	123.89
GYM (S)	8	3	32	10	8	3	32	52	0	42	.07	839.16	839.16	123.93
USS MERCURY	8	4	35	28	8	4	43	56	8	28	30.36	748.87	243.33	124.63
HAW (S)	8	4	54	7	8	5	0	54	6	46	20.23	807.62	245.89	124.84
USS HUNTSVILLE	8	4	59	49	8	5	4	48	4	58	4.47	671.13	611.26	124.86
USS MERCURY	8	6	11	54	8	6	18	57	7	3	12.72	829.21	419.11	125.63
HAW (S)	8	6	29	52	8	6	36	4	6	12	9.86	642.61	428.57	125.81
USS REDSTONE	8	6	45	4	8	6	52	15	7	10	8.08	900.33	695.76	125.96
ACN (S)	8	7	11	0	8	7	18	22	7	22	5.60	1091.12	994.77	126.24
USS MERCURY	8	7	48	11	8	7	54	35	6	23	10.41	744.50	420.20	126.61
USS REDSTONE	8	8	19	2	8	8	28	59	9	56	39.22	1191.29	277.14	126.98
ACN (S)	8	8	45	24	8	8	56	7	10	42	31.58	1003.04	394.65	127.24
USS MERCURY	8	9	23	39	8	9	30	38	6	58	33.62	577.85	163.51	127.61
GWM (S)	8	9	29	31	8	9	36	10	6	38	14.61	596.74	327.83	127.67
USS REDSTONE	8	9	54	39	8	10	4	57	10	18	28.20	1249.19	400.53	127.98
ACN (S)	8	10	21	26	8	10	31	15	9	48	21.15	1064.46	484.60	128.23
USS MERCURY	8	10	59	30	8	11	5	37	6	6	9.63	699.88	425.04	128.60
GWM (S)	8	11	4	58	8	11	11	41	6	43	11.23	759.78	435.96	128.66
USS REDSTONE	8	11	30	35	8	11	41	11	10	36	23.01	1229.95	500.79	128.98
CYI (S)	8	12	3	16	8	12	10	1	6	44	6.87	876.93	727.12	129.24
USS REDSTONE	8	13	6	15	8	13	17	33	11	17	36.56	1159.65	374.68	129.97
ANG (S)	8	13	27	22	8	13	33	51	6	29	5.08	1010.97	895.68	130.11
CYI (S)	8	13	37	39	8	13	46	10	8	31	29.93	812.57	256.85	130.24
MAD (S)	8	13	42	47	8	13	47	48	5	1	3.79	964.33	739.63	130.26
RID (S)	8	13	42	45	8	13	47	46	5	0	3.79	960.08	739.81	130.26
HSK (S)	8	14	22	35	8	14	30	32	7	57	9.41	1046.03	722.94	130.70
NBE (S)	8	14	22	31	8	14	30	33	8	1	9.70	1036.29	714.06	130.70
USS REDSTONE	8	14	42	1	8	14	53	3	11	1	32.36	1216.25	407.08	130.96
BDA (S)	8	15	6	35	8	15	7	58	1	23	.30	1060.94	1060.94	131.08
ANG (S)	8	15	1	16	8	15	10	41	9	24	40.34	831.56	248.21	131.10
USS VANGUARD	8	15	7	28	8	15	14	15	6	46	7.86	841.40	648.26	131.14
CYI (S)	8	15	13	34	8	15	21	20	7	46	22.16	763.83	292.95	131.24
MAD (S)	8	15	17	23	8	15	23	9	5	45	6.47	787.95	558.84	131.27
RID (S)	8	15	17	21	8	15	23	7	5	45	6.42	794.74	560.63	131.27
CRO (S)	8	15	48	48	8	15	57	37	8	49	21.05	1009.47	408.40	131.61
HSK (S)	8	15	56	42	8	16	6	47	10	5	25.88	1122.28	422.57	131.70
NBE (S)	8	15	56	40	8	16	6	48	10	7	26.74	1117.19	413.13	131.70
USS REDSTONE	8	16	19	15	8	16	26	27	7	12	5.71	1081.80	964.01	131.91
TEX (S)	8	16	34	24	8	16	35	49	1	24	.43	1092.85	1092.85	131.99
MIL (S)	8	16	35	10	8	16	42	23	7	13	8.77	835.19	654.93	132.05
GBM (S)	8	16	35	0	8	16	43	5	8	5	14.18	944.61	508.93	132.08
BDA (S)	8	16	38	48	8	16	46	18	7	30	12.62	1050.11	492.39	132.10

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ANG (S)	8	16	37	44	8	16	45	35	7	50	11.55	869.58	518.12	132.10
USS VANGUARD	8	16	42	6	8	16	50	3	7	56	23.81	858.00	281.70	132.15
CYI (S)	8	16	49	39	8	16	56	43	7	4	20.14	649.32	272.60	132.22
MAD (S)	8	16	53	1	8	16	57	27	4	26	3.53	723.27	642.57	132.25
RID (S)	8	16	52	57	8	16	57	26	4	29	3.61	726.14	639.06	132.25
CRO (S)	8	17	23	35	8	17	33	47	10	12	47.43	1040.85	257.27	132.61
HSK (S)	8	17	31	42	8	17	42	33	10	51	39.54	986.18	335.99	132.70
NBE (S)	8	17	31	41	8	17	42	34	10	53	40.95	983.99	327.94	132.70
GYM (S)	8	18	4	32	8	18	10	47	6	15	5.26	1084.53	810.18	132.96
TEX (S)	8	18	6	17	8	18	14	30	8	13	16.30	1000.80	450.76	133.01
MIL (S)	8	18	9	55	8	18	18	18	8	23	26.14	1031.02	279.27	133.06
GBM (S)	8	18	10	17	8	18	18	42	8	24	44.88	1036.05	183.47	133.06
ANG (S)	8	18	16	14	8	18	19	31	3	16	1.45	866.35	845.35	133.09
BDA (S)	8	18	13	50	8	18	21	44	7	53	26.10	771.62	262.72	133.11
USS VANGUARD	8	18	17	42	8	18	25	10	7	27	40.97	589.43	162.35	133.14
CYI (S)	8	18	25	24	8	18	32	20	6	55	45.96	567.80	124.37	133.23
CRO (S)	8	18	59	30	8	19	9	29	9	59	21.04	1205.96	495.34	133.62
HSK (S)	8	19	7	13	8	19	17	34	10	20	21.27	1227.47	530.64	133.70
NBE (S)	8	19	7	12	8	19	17	36	10	23	21.91	1226.69	520.75	133.70
USS HUNTSVILLE	8	19	33	23	8	19	40	35	7	11	7.77	862.97	724.00	133.90
GDS (S)	8	19	39	25	8	19	44	58	5	33	3.79	830.04	795.60	133.95
PIR (S)	8	19	39	26	8	19	44	58	5	31	3.76	832.80	797.11	133.95
GYM (S)	8	19	38	24	8	19	46	56	8	32	29.67	907.86	271.73	133.97
TEX (S)	8	19	41	26	8	19	49	44	8	17	40.86	803.87	199.06	134.02
MIL (S)	8	19	45	34	8	19	53	12	7	37	31.00	602.29	217.53	134.04
GBM (S)	8	19	46	15	8	19	53	35	7	20	15.19	783.01	375.59	134.07
BDA (S)	8	19	49	25	8	19	56	48	7	22	63.14	491.93	115.47	134.09
USS VANGUARD	8	19	53	19	8	20	0	8	6	49	21.89	619.70	233.90	134.14
CYI (S)	8	20	1	22	8	20	6	28	5	6	5.28	604.04	531.28	134.20
CRO (S)	8	20	35	7	8	20	45	40	10	33	24.64	1193.78	468.95	134.62
HSK (S)	8	20	43	12	8	20	51	23	8	11	8.06	1259.54	877.08	134.68
NBE (S)	8	20	43	11	8	20	51	27	8	16	8.33	1256.84	867.63	134.68
HAW (S)	8	21	2	32	8	21	10	44	8	11	11.75	1035.73	602.03	134.84
USS HUNTSVILLE	8	21	7	39	8	21	16	32	8	53	30.46	751.79	269.11	134.90
GDS (S)	8	21	13	23	8	21	20	47	7	24	15.50	629.20	394.63	134.95
PIR (S)	8	21	13	23	8	21	20	47	7	24	15.35	632.16	397.12	134.95
GYM (S)	8	21	13	59	8	21	22	0	8	1	22.71	730.03	293.83	134.98
TEX (S)	8	21	17	25	8	21	24	47	7	22	23.36	548.88	259.57	135.00
MIL (S)	8	21	21	24	8	21	28	32	7	8	31.35	544.12	183.41	135.05
GBM (S)	8	21	22	6	8	21	28	59	6	53	18.10	639.51	284.89	135.05
BDA (S)	8	21	25	0	8	21	31	31	6	30	12.96	785.82	338.19	135.10
ANG (S)	8	21	27	56	8	21	32	12	4	16	2.94	660.83	639.43	135.10
USS VANGUARD	8	21	29	20	8	21	33	59	4	39	4.28	675.65	572.97	135.12
ACN (S)	8	21	41	34	8	21	46	50	5	15	4.35	686.86	638.10	135.23
CRO (S)	8	22	10	25	8	22	21	36	11	11	51.52	1194.15	284.95	135.61
HAW (S)	8	22	37	23	8	22	46	21	8	57	34.63	740.02	260.07	135.84
USS HUNTSVILLE	8	22	43	37	8	22	51	20	7	42	19.62	867.81	338.20	135.91
GDS (S)	8	22	48	28	8	22	55	44	7	15	15.77	771.80	332.91	135.96
GYM (S)	8	22	49	54	8	22	57	5	7	10	21.66	629.89	262.85	135.96

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
PIR (S)	8	22	48	29	8	22	55	44	7	14	15.68	773.83	334.08	135.96
TEX (S)	8	22	53	11	8	23	0	8	6	57	24.74	846.51	214.52	136.01
MIL (S)	8	22	56	53	8	23	3	35	6	41	16.64	748.04	277.59	136.05
GBM (S)	8	22	57	31	8	23	4	24	6	53	42.23	552.63	131.23	136.05
BDA (S)	8	23	1	41	8	23	4	34	2	53	1.82	683.96	683.96	136.05
ANG (S)	8	23	2	7	8	23	8	59	6	52	40.60	557.77	134.92	136.09
ACN (S)	8	23	15	22	8	23	23	26	8	3	38.05	985.16	203.32	136.24
CRO (S)	8	23	46	17	8	23	56	18	10	0	17.86	1097.43	592.45	136.58
GWM (S)	8	23	59	0	9	0	8	25	9	24	19.40	1165.61	488.89	136.68
HAW (S)	9	0	13	47	9	0	20	58	7	11	11.75	734.59	479.17	136.82
USS HUNTSVILLE	9	0	19	53	9	0	26	32	6	38	11.55	656.30	414.95	136.89
GDS (S)	9	0	23	57	9	0	30	22	6	24	12.53	605.52	358.91	136.94
PIR (S)	9	0	23	58	9	0	30	21	6	23	12.37	607.73	361.91	136.94
GYM (S)	9	0	25	28	9	0	32	29	7	1	60.97	534.44	104.96	136.96
TEX (S)	9	0	28	34	9	0	35	7	6	32	16.83	674.52	275.91	136.99
MIL (S)	9	0	33	24	9	0	36	59	3	35	2.47	652.59	652.59	137.01
GBM (S)	9	0	33	58	9	0	37	59	4	0	2.75	697.37	639.42	137.02
ANG (S)	9	0	38	26	9	0	42	55	4	29	3.49	694.07	643.91	137.06
ACN (S)	9	0	52	20	9	0	57	40	5	19	3.66	1027.57	850.27	137.22
USS MERCURY	9	1	33	32	9	1	39	6	5	33	3.26	976.04	936.07	137.62
GWM (S)	9	1	34	25	9	1	43	32	9	7	27.54	991.25	334.94	137.68
HAW (S)	9	1	50	30	9	1	56	0	5	30	5.73	782.19	586.40	137.83
USS HUNTSVILLE	9	1	55	28	9	2	2	14	6	46	20.23	598.54	246.03	137.90
GDS (S)	9	2	0	44	9	2	3	21	2	36	.89	770.90	737.91	137.92
PIR (S)	9	2	0	46	9	2	3	19	2	33	.83	773.81	740.89	137.92
GYM (S)	9	2	1	19	9	2	6	48	5	29	6.44	535.19	489.77	137.94
TEX (S)	9	2	7	10	9	2	7	17	0	6	.04	789.41	789.41	137.96
GWM (S)	9	3	12	27	9	3	17	6	4	39	2.81	937.32	839.08	138.64
USS MERCURY	9	3	6	54	9	3	15	45	8	51	27.88	1056.39	317.60	138.64
HAW (S)	9	3	26	0	9	3	32	6	6	6	10.00	638.38	403.48	138.83
USS HUNTSVILLE	9	3	30	52	9	3	37	15	6	22	13.65	724.21	318.51	138.87
USS MERCURY	9	4	42	28	9	4	50	49	8	20	30.34	890.99	251.48	139.62
HAW (S)	9	5	1	9	9	5	7	50	6	40	22.35	774.20	216.08	139.83
USS MERCURY	9	6	18	49	9	6	25	43	6	54	10.74	868.60	448.09	140.63
HAW (S)	9	6	38	6	9	6	40	54	2	48	1.66	701.08	701.08	140.78
USS REDSTONE	9	6	51	3	9	6	59	4	8	1	16.06	914.76	446.84	140.95
ACN (S)	9	7	16	49	9	7	25	54	9	5	11.16	1192.76	764.41	141.25
USS MERCURY	9	7	54	35	9	8	1	12	6	36	12.58	741.34	371.66	141.61
GWM (S)	9	8	1	50	9	8	5	22	3	32	2.29	767.07	661.52	141.68
USS REDSTONE	9	8	25	30	9	8	35	3	9	32	38.60	783.03	259.49	141.96
ACN (S)	9	8	51	28	9	9	2	24	10	55	76.77	965.75	222.69	142.24
USS MERCURY	9	9	29	50	9	9	36	45	6	54	47.81	516.05	119.40	142.61
GWM (S)	9	9	35	31	9	9	42	27	6	55	42.92	569.19	130.57	142.67
USS REDSTONE	9	10	1	5	9	10	10	49	9	44	23.13	1081.28	436.17	142.96
ACN (S)	9	10	28	9	9	10	36	17	8	7	8.16	1061.31	796.88	143.21
CYI (S)	9	10	37	6	9	10	37	23	0	16	.10	1134.35	1134.35	143.23
USS MERCURY	9	11	6	35	9	11	9	57	3	22	1.46	707.10	705.04	143.58
GWM (S)	9	11	12	16	9	11	15	56	3	40	1.98	763.34	711.49	143.64
USS REDSTONE	9	11	36	32	9	11	46	56	10	24	27.60	1050.15	419.56	143.96

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
CYI (S)	9	12	7	55	9	12	16	19	8	23	13.24	883.14	531.34	144.24
MAD (S)	9	12	14	21	9	12	17	29	3	7	1.18	967.19	956.03	144.27
RID (S)	9	12	14	21	9	12	17	25	3	4	1.15	972.83	957.55	144.27
HSK (S)	9	12	56	36	9	12	57	34	0	57	.33	1013.27	1013.27	144.69
NBE (S)	9	12	56	16	9	12	57	42	1	25	.50	1004.68	1004.68	144.69
USS REDSTONE	9	13	11	48	9	13	22	55	11	7	80.54	934.93	227.14	144.95
ANG (S)	9	13	31	29	9	13	40	18	8	48	12.67	927.41	641.08	145.11
USS VANGUARD	9	13	38	59	9	13	43	0	4	1	1.87	1093.15	986.25	145.13
CYI (S)	9	13	42	57	9	13	51	32	8	35	63.99	1008.83	157.41	145.25
MAD (S)	9	13	47	25	9	13	53	29	6	3	6.04	862.77	638.78	145.27
RID (S)	9	13	47	23	9	13	53	26	6	3	5.95	870.18	642.12	145.27
CRO (S)	9	14	20	43	9	14	25	30	4	46	3.32	962.52	780.88	145.60
HSK (S)	9	14	27	26	9	14	35	46	8	20	13.83	1066.70	546.82	145.72
NBE (S)	9	14	27	23	9	14	35	47	8	23	14.29	1064.56	536.76	145.72
USS REDSTONE	9	14	47	33	9	14	57	37	10	4	18.27	1177.04	582.74	145.94
MIL (S)	9	15	6	49	9	15	10	18	3	29	1.33	1111.59	1048.98	146.05
GBM (S)	9	15	5	46	9	15	11	55	6	9	4.66	1003.49	881.02	146.07
BDA (S)	9	15	9	14	9	15	15	30	6	15	4.85	1124.67	815.57	146.11
ANG (S)	9	15	6	18	9	15	15	51	9	33	53.71	973.96	209.57	146.11
USS VANGUARD	9	15	11	48	9	15	19	48	7	59	13.50	867.34	507.91	146.16
CYI (S)	9	15	18	51	9	15	26	34	7	43	24.60	899.59	263.59	146.23
MAD (S)	9	15	22	15	9	15	28	6	5	50	6.89	753.32	556.37	146.26
RID (S)	9	15	22	12	9	15	28	4	5	51	6.93	746.67	555.27	146.26
CRO (S)	9	15	53	37	9	16	2	34	8	57	36.06	835.90	244.18	146.60
HSK (S)	9	16	1	38	9	16	11	31	9	52	26.64	1171.36	396.94	146.72
NBE (S)	9	16	1	37	9	16	11	31	9	53	27.33	1169.76	390.02	146.72
USS REDSTONE	9	16	27	10	9	16	27	22	0	11	.06	1244.89	1244.89	146.88
TEX (S)	9	16	36	35	9	16	43	15	6	40	5.46	1072.32	849.02	147.02
MIL (S)	9	16	39	16	9	16	47	44	8	28	17.34	914.10	458.39	147.07
GBM (S)	9	16	39	21	9	16	48	18	8	57	24.62	787.35	356.80	147.07
ANG (S)	9	16	43	16	9	16	50	8	6	51	7.67	826.21	648.90	147.09
BDA (S)	9	16	43	9	9	16	51	20	8	10	21.85	1055.99	349.80	147.12
USS VANGUARD	9	16	46	48	9	16	54	56	8	8	42.72	927.77	183.87	147.14
CYI (S)	9	16	54	34	9	17	1	44	7	10	18.16	756.03	284.48	147.24
MAD (S)	9	16	58	24	9	17	1	25	3	1	1.41	786.19	748.94	147.24
RID (S)	9	16	58	20	9	17	1	25	3	4	1.50	787.18	744.32	147.24
CRO (S)	9	17	28	45	9	17	38	16	9	30	31.32	984.25	320.37	147.61
HSK (S)	9	17	36	32	9	17	46	54	10	22	32.96	1029.07	359.93	147.70
NBE (S)	9	17	36	32	9	17	46	56	10	24	34.07	1027.57	351.55	147.70
GYM (S)	9	18	8	0	9	18	16	10	8	10	10.83	924.21	609.83	147.98
TEX (S)	9	18	10	24	9	18	19	15	8	50	33.15	981.29	271.20	148.03
MIL (S)	9	18	14	18	9	18	22	56	8	37	59.26	867.86	158.66	148.05
GBM (S)	9	18	14	53	9	18	23	13	8	19	38.85	980.04	212.72	148.05
ANG (S)	9	18	22	5	9	18	23	40	1	34	.55	883.33	883.33	148.08
BDA (S)	9	18	18	20	9	18	26	27	8	6	35.85	810.29	199.10	148.10
USS VANGUARD	9	18	22	15	9	18	29	49	7	34	21.77	728.05	268.36	148.15
CYI (S)	9	18	30	0	9	18	36	47	6	47	23.84	573.11	212.33	148.22
CRO (S)	9	19	4	18	9	19	14	9	9	51	22.30	1066.90	462.72	148.61
HSK (S)	9	19	11	51	9	19	21	36	9	44	16.09	1199.58	621.27	148.69

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
NBE (S)	9	19	11	51	9	19	21	39	9	48	16.58	1191.36	610.92	148.69
HAW (S)	9	19	33	38	9	19	38	18	4	39	2.15	1061.60	1061.44	148.83
USS HUNTSVILLE	9	19	37	0	9	19	45	45	8	44	16.92	1120.92	494.05	148.91
GDS (S)	9	19	42	54	9	19	50	8	7	13	8.93	1024.09	614.33	148.96
PIR (S)	9	19	42	55	9	19	50	8	7	12	8.87	1027.14	616.15	148.96
GYM (S)	9	19	42	45	9	19	51	32	8	46	62.93	990.37	164.94	148.99
TEX (S)	9	19	45	57	9	19	54	22	8	24	26.60	771.16	271.43	149.01
MIL (S)	9	19	50	9	9	19	57	54	7	45	19.03	747.74	316.10	149.06
GBM (S)	9	19	50	58	9	19	58	19	7	21	17.09	904.50	336.97	149.06
BDA (S)	9	19	53	52	9	20	1	12	7	20	32.49	619.68	191.77	149.09
ANG (S)	9	19	58	26	9	19	59	40	1	13	.54	804.41	804.41	149.09
USS VANGUARD	9	19	57	50	9	20	4	26	6	36	15.03	578.08	317.14	149.13
CYI (S)	9	20	7	14	9	20	9	17	2	2	.08	781.01	776.59	149.19
CRO (S)	9	20	39	38	9	20	50	20	10	42	36.42	1048.15	348.23	149.61
HSK (S)	9	20	48	39	9	20	54	17	5	37	3.19	1189.85	1084.28	149.65
NBE (S)	9	20	48	36	9	20	54	23	5	47	3.39	1183.95	1075.27	149.65
HAW (S)	9	21	6	19	9	21	15	37	9	18	26.49	992.15	361.11	149.85
USS HUNTSVILLE	9	21	12	1	9	21	21	0	8	59	49.30	849.43	193.58	149.90
GDS (S)	9	21	17	30	9	21	25	15	7	45	20.71	893.31	331.02	149.97
GYM (S)	9	21	18	33	9	21	26	33	7	59	26.70	864.96	256.41	149.97
PIR (S)	9	21	17	30	9	21	25	15	7	44	20.47	892.64	333.86	149.97
TEX (S)	9	21	21	54	9	21	29	16	7	22	20.13	836.14	300.77	150.02
MIL (S)	9	21	25	47	9	21	33	3	7	16	41.19	576.09	151.17	150.04
GBM (S)	9	21	26	33	9	21	33	36	7	3	17.17	739.04	295.20	150.07
BDA (S)	9	21	29	35	9	21	35	37	6	2	9.39	719.89	416.84	150.09
USS VANGUARD	9	21	35	10	9	21	35	36	0	26	.13	780.61	780.61	150.09
ANG (S)	9	21	31	48	9	21	37	33	5	44	7.92	730.49	446.10	150.11
ACN (S)	9	21	45	14	9	21	52	5	6	51	13.30	812.86	383.13	150.24
CRO (S)	9	22	14	57	9	22	25	54	10	56	37.89	1181.79	348.65	150.60
GWM (S)	9	22	29	14	9	22	36	16	7	2	5.57	1238.60	922.63	150.69
HAW (S)	9	22	41	49	9	22	50	37	8	47	30.46	895.45	287.42	150.83
USS HUNTSVILLE	9	22	48	18	9	22	55	48	7	29	16.23	815.73	387.97	150.89
GDS (S)	9	22	52	50	9	23	0	0	7	9	20.98	850.14	283.88	150.94
PIR (S)	9	22	52	51	9	23	0	0	7	8	20.70	851.92	286.77	150.94
GYM (S)	9	22	54	25	9	23	1	34	7	9	30.53	809.32	199.03	150.96
TEX (S)	9	22	57	32	9	23	4	30	6	58	67.32	791.61	104.83	150.99
MIL (S)	9	23	1	29	9	23	7	52	6	22	13.73	813.90	322.08	151.04
GBM (S)	9	23	2	9	9	23	8	36	6	27	14.37	803.97	311.92	151.04
ANG (S)	9	23	6	39	9	23	13	36	6	56	18.91	788.05	278.59	151.09
ACN (S)	9	23	19	56	9	23	28	8	8	12	13.64	833.48	510.46	151.22
CRO (S)	9	23	51	49	9	23	59	47	7	57	7.43	1110.93	851.85	151.56
GWM (S)	10	0	3	33	10	0	12	48	9	14	48.25	993.58	213.79	151.69
HAW (S)	10	0	19	12	10	0	25	0	5	47	6.42	789.52	553.92	151.83
USS HUNTSVILLE	10	0	24	46	10	0	30	55	6	9	9.39	760.09	418.47	151.91
GDS (S)	10	0	28	47	10	0	34	12	5	25	6.18	551.36	503.55	151.93
PIR (S)	10	0	28	48	10	0	34	12	5	23	6.09	553.81	506.51	151.93
GYM (S)	10	0	30	0	10	0	36	41	6	41	21.72	652.62	225.42	151.95
TEX (S)	10	0	33	17	10	0	39	9	5	52	8.55	741.11	438.16	151.99
ACN (S)	10	0	58	15	10	1	1	21	3	5	.80	1089.35	1065.90	152.20

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
USS MERCURY	10	1	37	9	10	1	44	11	7	1	8.25	835.80	659.60	152.62
GWM (S)	10	1	39	55	10	1	47	15	7	20	9.13	907.79	574.66	152.67
HAW (S)	10	1	55	21	10	2	0	25	5	3	4.56	623.75	573.41	152.82
USS HUNTSVILLE	10	1	59	49	10	2	6	38	6	48	30.17	616.38	172.06	152.89
GYM (S)	10	2	6	26	10	2	10	1	3	34	2.22	758.27	687.94	152.93
USS MERCURY	10	3	11	28	10	3	19	56	8	27	22.65	769.79	230.24	153.63
HAW (S)	10	3	30	16	10	3	36	40	6	23	13.67	706.87	318.71	153.82
USS HUNTSVILLE	10	3	35	28	10	3	41	9	5	41	7.42	755.03	478.28	153.88
USS MERCURY	10	4	47	25	10	4	54	38	7	13	16.21	684.02	353.75	154.61
HAW (S)	10	5	5	23	10	5	11	56	6	33	15.51	597.40	301.62	154.81
USS REDSTONE	10	5	21	43	10	5	26	56	5	13	3.59	1037.06	837.05	154.96
ACN (S)	10	5	47	15	10	5	52	45	5	30	2.63	1246.98	1107.12	155.25
USS MERCURY	10	6	23	30	10	6	29	50	6	19	10.68	636.26	406.56	155.62
USS REDSTONE	10	6	54	37	10	7	4	0	9	23	40.15	1000.79	253.97	155.96
ACN (S)	10	7	20	51	10	7	30	46	9	55	18.70	1184.70	546.94	156.25
USS MERCURY	10	7	59	51	10	8	5	32	6	40	20.03	635.95	240.82	156.62
GWM (S)	10	8	4	59	10	8	10	37	5	37	6.28	509.61	509.22	156.67
USS REDSTONE	10	8	29	34	10	8	39	38	10	3	34.38	1044.63	326.24	156.97
ACN (S)	10	8	56	4	10	9	6	13	10	8	30.82	1104.31	366.00	157.22
USS MERCURY	10	9	34	6	10	9	40	30	6	24	13.88	670.19	318.05	157.60
GWM (S)	10	9	39	29	10	9	46	29	7	0	21.87	560.30	247.36	157.66
USS REDSTONE	10	10	5	13	10	10	15	24	10	11	22.85	1129.32	479.23	157.97
ACN (S)	10	10	34	44	10	10	37	49	3	4	1.09	1149.19	1058.76	158.18
CYI (S)	10	10	38	33	10	10	43	44	5	11	3.37	1069.53	882.39	158.23
USS REDSTONE	10	11	40	41	10	11	51	27	10	45	32.59	1218.49	385.84	158.97
ANG (S)	10	12	2	53	10	12	6	44	3	51	1.51	1127.09	1064.88	159.11
CYI (S)	10	12	11	55	10	12	20	11	8	16	22.60	888.58	311.31	159.24
MAD (S)	10	12	17	33	10	12	21	35	4	1	2.09	826.71	814.57	159.26
RID (S)	10	12	17	32	10	12	21	32	3	59	2.09	826.63	819.59	159.26
HSK (S)	10	12	57	25	10	13	3	53	6	27	5.70	978.45	812.44	159.70
NBE (S)	10	12	57	21	10	13	3	55	6	34	5.94	973.05	803.21	159.70
USS REDSTONE	10	13	15	57	10	13	26	52	10	54	42.18	1206.77	320.13	159.96
ANG (S)	10	13	35	16	10	13	44	22	9	6	23.79	850.13	367.23	160.10
USS VANGUARD	10	13	41	55	10	13	47	37	5	42	4.81	931.56	764.13	160.15
CYI (S)	10	13	47	16	10	13	55	6	7	49	28.55	789.60	239.58	160.25
MAD (S)	10	13	51	21	10	13	56	58	5	37	6.00	798.47	574.13	160.27
RID (S)	10	13	51	18	10	13	56	56	5	37	5.95	805.50	576.34	160.27
CRO (S)	10	14	23	2	10	14	30	45	7	42	12.30	1098.79	535.62	160.62
HSK (S)	10	14	30	44	10	14	40	12	9	27	21.45	927.81	449.97	160.71
NBE (S)	10	14	30	42	10	14	40	13	9	30	22.18	1093.01	439.91	160.71
USS REDSTONE	10	14	52	17	10	15	0	37	8	19	9.11	1183.76	804.13	160.91
MIL (S)	10	15	9	22	10	15	15	21	5	58	4.97	924.03	790.51	161.06
GBM (S)	10	15	8	57	10	15	16	15	7	18	9.31	803.07	629.35	161.06
BDA (S)	10	15	12	40	10	15	19	32	6	52	8.38	1035.42	603.86	161.11
ANG (S)	10	15	10	57	10	15	19	11	8	14	18.80	864.29	395.43	161.11
USS VANGUARD	10	15	15	42	10	15	23	26	7	44	15.51	794.39	383.45	161.15
CYI (S)	10	15	23	6	10	15	30	11	7	4	21.71	549.14	253.45	161.23
MAD (S)	10	15	26	24	10	15	31	13	4	49	4.52	790.28	592.45	161.25
RID (S)	10	15	26	21	10	15	31	11	4	50	4.57	783.20	590.36	161.25

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(a) CSM unified S-band sites - Concluded

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
CRO (S)	10	15	57	7	10	16	6	47	9	39	35.67	1169.17	279.87	161.62
HSK (S)	10	16	5	15	10	16	15	41	10	26	35.73	1061.49	339.84	161.71
NBE (S)	10	16	5	14	10	16	15	42	10	27	36.94	1058.94	331.93	161.71
GYM (S)	10	16	38	53	10	16	43	0	4	6	1.97	1019.79	968.14	161.97
TEX (S)	10	16	39	51	10	16	47	22	7	31	9.19	935.26	609.24	162.02
MIL (S)	10	16	43	5	10	16	51	22	8	16	23.77	798.93	316.47	162.06
GBM (S)	10	16	43	20	10	16	51	51	8	30	29.40	746.77	252.66	162.06
ANG (S)	10	16	48	32	10	16	52	59	4	26	2.87	932.18	769.50	162.09
BDA (S)	10	16	47	5	10	16	54	49	7	44	27.25	855.36	252.50	162.11
USS VANGUARD	10	16	50	54	10	16	58	24	7	30	52.53	513.44	135.31	162.14
CYI (S)	10	16	58	35	10	17	5	26	6	51	25.96	795.87	196.73	162.23
CRO (S)	10	17	32	35	10	17	42	26	9	50	24.38	1094.73	423.00	162.60
HSK (S)	10	17	40	19	10	17	50	41	10	21	25.57	1135.77	450.64	162.69
NBE (S)	10	17	40	19	10	17	50	43	10	23	26.24	1134.75	442.88	162.69
USS HUNTSVILLE	10	18	7	21	10	18	12	55	5	34	3.72	1028.20	883.69	162.91
GDS (S)	10	18	13	30	10	18	17	17	3	47	1.77	928.14	920.32	162.95
PIR (S)	10	18	13	32	10	18	17	17	3	44	1.72	929.39	922.81	162.95
GYM (S)	10	18	11	38	10	18	19	53	8	15	17.36	852.80	401.49	162.98
TEX (S)	10	18	14	29	10	18	22	42	8	12	64.03	978.46	145.96	163.00
MIL (S)	10	18	18	34	10	18	26	20	7	45	43.76	932.76	164.85	163.05
GBM (S)	10	18	19	9	10	18	26	36	7	27	21.50	626.08	288.72	163.05
BDA (S)	10	18	22	26	10	18	29	51	7	24	40.15	847.19	156.58	163.10
USS VANGUARD	10	18	26	15	10	18	33	11	6	55	18.49	760.54	266.99	163.15
CYI (S)	10	18	34	0	10	18	38	46	4	45	10.15	791.99	386.38	163.21
CRO (S)	10	19	8	4	10	19	18	23	10	18	25.07	1066.29	449.01	163.61
HSK (S)	10	19	15	56	10	19	24	47	8	50	10.75	1236.03	766.91	163.68
NBE (S)	10	19	15	55	10	19	24	50	8	55	11.09	1226.46	756.80	163.68
HAW (S)	10	19	36	8	10	19	42	59	6	51	6.98	1144.46	757.35	163.83
USS HUNTSVILLE	10	19	40	47	10	19	48	50	8	3	28.61	1057.22	263.65	163.89
GDS (S)	10	19	46	54	10	19	52	40	5	45	8.37	887.07	452.53	163.94
PIR (S)	10	19	46	55	10	19	52	40	5	44	8.27	889.98	454.97	163.94

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7

(b) S-IVB unified S-band sites

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
HAW (S)	0	2	54	59	0	3	0	43	5	44	17.21	936.09	371.80	2.85
USS HUNTSVILLE	0	2	58	25	0	3	6	28	8	3	54.57	888.38	151.85	2.89
GDS (S)	0	3	3	26	0	3	11	5	7	39	18.69	862.74	340.35	2.97
GYM (S)	0	3	4	28	0	3	12	21	7	52	28.08	889.63	249.92	2.97
PIR (S)	0	3	3	27	0	3	11	6	7	39	18.47	862.68	343.27	2.97
TEX (S)	0	3	7	32	0	3	15	25	7	53	19.79	807.81	329.39	3.02
MIL (S)	0	3	11	12	0	3	19	0	7	48	37.04	821.08	204.79	3.05
GBM (S)	0	3	11	55	0	3	19	55	7	59	24.64	782.73	285.69	3.05
BDA (S)	0	3	14	46	0	3	22	17	7	31	16.66	580.66	386.90	3.08
ANG (S)	0	3	16	57	0	3	24	13	7	16	12.19	635.38	478.27	3.10
USS VANGUARD	0	3	18	44	0	3	24	34	5	49	4.23	942.56	747.69	3.12
ACN (S)	0	3	30	31	0	3	38	54	8	23	20.25	939.95	382.03	3.24
CRO (S)	0	4	1	49	0	4	10	52	9	2	46.30	972.77	213.26	3.59
GWM (S)	0	4	17	35	0	4	19	15	1	40	.72	941.07	941.07	3.67
HAW (S)	0	4	27	45	0	4	35	40	7	55	23.75	831.07	284.56	3.83
USS HUNTSVILLE	0	4	33	42	0	4	41	10	7	27	12.89	818.95	440.51	3.90
GDS (S)	0	4	37	57	0	4	45	48	7	50	23.77	859.63	286.52	3.95
PIR (S)	0	4	37	57	0	4	45	48	7	50	23.55	861.39	288.48	3.95
GYM (S)	0	4	39	22	0	4	47	26	8	3	20.87	744.79	320.52	3.98
TEX (S)	0	4	42	24	0	4	50	30	8	5	60.76	928.30	146.10	4.02
MIL (S)	0	4	46	5	0	4	54	0	7	54	22.17	903.75	317.16	4.04
GBM (S)	0	4	46	41	0	4	54	47	8	6	26.89	891.55	273.10	4.06
BDA (S)	0	4	51	12	0	4	54	36	3	24	1.58	945.20	878.73	4.06
ANG (S)	0	4	51	12	0	4	59	43	8	31	26.03	738.21	294.30	4.09
ACN (S)	0	5	5	12	0	5	13	43	8	30	15.44	823.78	482.03	4.22
CRO (S)	0	5	37	55	0	5	43	44	5	49	4.70	980.34	784.14	4.55
GWM (S)	0	5	48	56	0	5	57	11	8	14	25.24	777.32	287.98	4.68
HAW (S)	0	6	3	32	0	6	10	5	6	33	8.21	797.29	559.65	4.82
USS HUNTSVILLE	0	6	8	53	0	6	16	16	7	23	14.78	661.22	406.66	4.89
GDS (S)	0	6	12	42	0	6	19	56	7	13	12.87	659.04	450.64	4.94
PIR (S)	0	6	12	43	0	6	19	56	7	12	12.73	660.86	453.64	4.94
GYM (S)	0	6	14	11	0	6	22	16	8	5	48.52	914.98	170.84	4.96
TEX (S)	0	6	17	14	0	6	24	57	7	43	14.70	861.81	425.39	5.00
MIL (S)	0	6	22	27	0	6	26	23	3	56	2.06	977.73	861.34	5.02
GBM (S)	0	6	23	5	0	6	27	16	4	11	2.19	884.81	855.04	5.02
ANG (S)	0	6	27	56	0	6	32	5	4	9	2.25	950.20	880.37	5.05
ACN (S)	0	6	43	40	0	6	45	40	2	0	.68	1029.43	1029.43	5.18
USS MERCURY	0	7	22	13	0	7	27	49	5	36	4.69	942.58	712.33	5.62
GWM (S)	0	7	24	26	0	7	31	22	6	56	10.13	752.15	513.00	5.66
HAW (S)	0	7	38	57	0	7	45	24	6	26	7.87	765.62	575.57	5.83

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(b) S-IVB unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
GDS (S)	0	7	49	7	0	7	52	8	3	1	1.43	876.57	876.57	5.90
USS HUNTSVILLE	0	7	43	30	0	7	51	46	8	15	30.32	776.72	244.64	5.90
PIR (S)	0	7	49	9	0	7	52	4	2	55	1.37	879.65	879.65	5.90
GYM (S)	0	7	49	33	0	7	55	51	6	17	6.76	836.78	644.81	5.94
USS MERCURY	0	8	55	26	0	9	3	35	8	9	29.93	769.64	238.54	6.63
HAW (S)	0	9	13	24	0	9	21	18	7	53	16.18	773.53	386.98	6.84
USS HUNTSVILLE	0	9	18	30	0	9	26	2	7	32	14.79	658.30	429.31	6.88
USS MERCURY	0	10	30	32	0	10	38	9	7	36	19.97	574.71	323.79	7.62
HAW (S)	0	10	48	6	0	10	56	8	8	2	26.71	906.50	277.06	7.82
USS REDSTONE	0	11	5	23	0	11	10	24	5	0	3.14	1046.47	875.42	7.96
USS MERCURY	0	12	5	51	0	12	13	6	7	15	11.37	842.51	475.14	8.63
HAW (S)	0	12	25	24	0	12	27	40	2	16	.99	926.24	926.24	8.77
USS REDSTONE	0	12	37	46	0	12	46	47	9	1	34.37	987.38	272.33	8.97
ACN (S)	0	13	4	37	0	13	12	12	7	34	11.30	748.74	554.89	9.23
USS MERCURY	0	13	40	34	0	13	48	25	7	51	27.22	935.38	259.61	9.64
GWM (S)	0	13	46	41	0	13	53	45	7	3	10.50	725.15	519.27	9.68
USS REDSTONE	0	14	12	29	0	14	21	40	9	10	28.28	810.99	322.57	9.96
ACN (S)	0	14	38	53	0	14	47	27	8	33	23.74	751.78	325.55	10.22
USS MERCURY	0	15	15	10	0	15	23	17	8	6	21.12	782.88	323.75	10.62
GWM (S)	0	15	20	46	0	15	29	12	8	26	31.75	826.27	246.93	10.67
USS REDSTONE	0	15	47	48	0	15	56	28	8	39	18.34	1049.62	445.83	10.97
CYI (S)	0	16	21	51	0	16	23	6	1	15	.52	920.87	920.87	11.22
USS MERCURY	0	16	51	46	0	16	55	21	3	34	1.59	907.07	885.09	11.57
GWM (S)	0	16	57	57	0	17	1	1	3	3	1.00	958.49	947.10	11.63
USS REDSTONE	0	17	22	47	0	17	31	47	8	59	20.26	769.72	408.31	11.95
CYI (S)	0	17	53	1	0	18	0	39	7	38	17.69	868.44	359.12	12.25
RID (S)	0	17	58	35	0	18	2	15	3	39	1.99	816.52	816.52	12.25
MAD (S)	0	17	58	37	0	18	2	20	3	43	2.04	924.57	813.84	12.27
HSK (S)	0	18	38	57	0	18	44	26	5	28	3.70	1052.35	861.41	12.71
NBE (S)	0	18	38	52	0	18	44	28	5	36	3.90	1047.52	852.80	12.71
USS REDSTONE	0	18	57	33	0	19	6	37	9	4	57.43	971.99	184.23	12.95
ANG (S)	0	19	16	24	0	19	24	0	7	35	16.53	622.53	390.74	13.10
USS VANGUARD	0	19	23	12	0	19	27	4	3	52	1.95	853.50	832.08	13.14
CYI (S)	0	19	27	25	0	19	35	30	8	4	26.92	754.08	254.99	13.24
MAD (S)	0	19	31	20	0	19	37	36	6	15	7.61	763.21	575.08	13.26
RID (S)	0	19	31	18	0	19	37	33	6	15	7.60	757.87	575.56	13.26
CRO (S)	0	20	3	38	0	20	11	8	7	30	8.95	918.71	634.39	13.60
HSK (S)	0	20	11	35	0	20	20	6	8	31	17.02	919.49	462.42	13.70
NBE (S)	0	20	11	32	0	20	20	6	8	34	17.55	912.27	453.52	13.70
USS REDSTONE	0	20	33	17	0	20	39	46	6	28	6.55	883.60	707.51	13.91
MIL (S)	0	20	50	25	0	20	53	49	3	23	1.72	850.11	850.11	14.04
GBM (S)	0	20	49	37	0	20	55	14	5	36	5.17	850.29	687.08	14.06
BDA (S)	0	20	52	58	0	20	58	49	5	50	5.79	854.39	651.04	14.11
ANG (S)	0	20	50	52	0	20	58	39	7	46	20.05	869.74	329.72	14.11
USS VANGUARD	0	20	55	33	0	21	3	6	7	32	13.86	791.22	417.46	14.16
CYI (S)	0	21	2	28	0	21	10	10	7	41	24.62	546.26	272.97	14.23
MAD (S)	0	21	5	27	0	21	11	44	6	17	7.62	779.83	575.86	14.25
RID (S)	0	21	5	24	0	21	11	42	6	18	7.69	772.76	573.80	14.25
CRO (S)	0	21	37	13	0	21	46	25	9	12	51.80	1054.73	201.12	14.61

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(b) S-IVB unified S-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
HSK (S)	0	21	45	44	0	21	54	48	9	4	22.42	977.98	289.06	14.71
NBE (S)	0	21	45	43	0	21	54	49	9	6	33.85	975.60	280.08	14.71
TEX (S)	0	22	19	53	0	22	25	53	6	0	5.99	882.56	653.04	15.00
MIL (S)	0	22	22	35	0	22	30	16	7	40	22.42	587.53	298.88	15.05
GBM (S)	0	22	22	45	0	22	30	47	8	2	36.18	838.54	204.82	15.07
ANG (S)	0	22	27	29	0	22	32	16	4	47	3.36	822.33	746.41	15.07
BDA (S)	0	22	26	21	0	22	34	5	7	43	27.87	556.55	248.27	15.10
USS VANGUARD	0	22	29	49	0	22	37	50	8	0	38.66	830.57	190.67	15.15
CYI (S)	0	22	37	6	0	22	45	12	8	6	28.09	765.47	247.92	15.24
MAD (S)	0	22	40	46	0	22	44	35	3	48	2.15	905.27	811.60	15.24
RID (S)	0	22	40	41	0	22	44	34	3	52	2.23	906.44	807.84	15.24
CRO (S)	0	23	12	21	0	23	21	5	8	44	21.82	1067.76	388.90	15.59
HSK (S)	0	23	20	23	0	23	29	7	8	44	20.85	1068.39	398.04	15.69
NBE (S)	0	23	20	22	0	23	29	9	8	46	21.61	1067.29	388.32	15.69
GYM (S)	0	23	50	47	0	23	58	7	7	19	13.62	820.53	428.65	15.98
TEX (S)	0	23	53	18	1	0	1	15	7	57	48.16	906.84	163.90	16.00
MIL (S)	0	23	57	3	1	0	5	3	7	59	39.60	847.80	187.30	16.05
GBM (S)	0	23	57	38	1	0	5	21	7	42	25.79	542.63	262.97	16.05
ANG (S)	1	0	5	4	1	0	5	48	0	43	.31	904.25	904.25	16.08
BDA (S)	1	0	0	42	1	0	8	46	8	4	32.37	772.44	219.11	16.10
USS VANGUARD	1	0	4	21	1	0	12	24	8	2	25.92	749.40	262.30	16.15
CYI (S)	1	0	11	51	1	0	19	31	7	39	20.09	948.94	329.55	16.23
CRO (S)	1	0	47	33	1	0	56	9	8	35	17.93	939.64	447.04	16.61
HSK (S)	1	0	55	29	1	1	2	29	7	0	7.73	1063.43	684.12	16.67
NBE (S)	1	0	55	27	1	1	2	32	7	5	8.05	1060.76	673.70	16.67
HAW (S)	1	1	15	57	1	1	19	50	3	52	2.12	909.41	840.73	16.84
USS HUNTSVILLE	1	1	19	21	1	1	27	2	7	41	20.17	928.29	327.25	16.90
GDS (S)	1	1	24	47	1	1	31	32	6	44	9.32	917.62	524.80	16.97
GYM (S)	1	1	23	46	1	1	32	59	9	12	42.33	825.45	178.49	16.97
PIR (S)	1	1	24	49	1	1	31	32	6	43	9.22	920.58	527.66	16.97
TEX (S)	1	1	28	0	1	1	35	50	7	49	25.88	857.17	261.87	17.02
MIL (S)	1	1	31	53	1	1	39	42	7	48	28.36	888.05	243.18	17.07
GBM (S)	1	1	32	36	1	1	40	13	7	36	15.04	788.48	392.04	17.07
BDA (S)	1	1	35	24	1	1	43	16	7	51	39.38	908.85	189.11	17.09
ANG (S)	1	1	38	32	1	1	43	9	4	36	3.00	811.27	767.81	17.09
USS VANGUARD	1	1	39	10	1	1	46	29	7	19	12.95	871.18	441.83	17.13
CYI (S)	1	1	48	55	1	1	50	54	1	58	.72	913.59	913.59	17.17
ACN (S)	1	1	53	44	1	1	56	47	3	3	1.40	901.86	901.86	17.23
CRO (S)	1	2	22	20	1	2	31	19	8	59	39.48	1051.72	242.44	17.61
HAW (S)	1	2	48	8	1	2	56	14	8	5	24.33	768.61	281.88	17.84
USS HUNTSVILLE	1	2	53	44	1	3	1	40	7	56	25.28	807.49	269.41	17.91
GDS (S)	1	2	58	39	1	3	6	21	7	41	21.14	844.72	304.57	17.96
PIR (S)	1	2	58	40	1	3	6	21	7	41	20.99	846.92	306.10	17.96
GYM (S)	1	2	59	52	1	3	7	35	7	42	21.81	921.77	298.42	17.98
TEX (S)	1	3	2	59	1	3	10	43	7	43	25.69	907.84	263.34	18.01
MIL (S)	1	3	6	33	1	3	14	37	8	4	43.30	821.45	176.92	18.05
GBM (S)	1	3	7	15	1	3	15	12	7	57	53.11	915.80	153.12	18.07
BDA (S)	1	3	10	12	1	3	17	2	6	49	9.76	778.62	518.75	18.07
USS VANGUARD	1	3	14	8	1	3	17	48	1	40	.75	902.73	902.73	18.09

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(b) S-IVB unified S-band sites - Concluded

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ANG (S)	1	3	11	59	1	3	19	47	7	47	16.88	822.56	373.23	18.11
ACN (S)	1	3	25	30	1	3	34	14	8	43	33.79	790.38	246.69	18.24
CRO (S)	1	3	57	10	1	4	5	40	8	29	22.96	1055.37	356.13	18.58
GWM (S)	1	4	10	39	1	4	16	23	5	44	4.92	925.80	724.23	18.68
HAW (S)	1	4	23	10	1	4	30	33	7	23	17.17	823.19	358.73	18.83
USS HUNTSVILLE	1	4	29	5	1	4	36	10	7	5	12.93	902.35	431.48	18.90
GDS (S)	1	4	33	6	1	4	40	37	7	31	22.30	809.95	292.91	18.95
PIR (S)	1	4	33	7	1	4	40	37	7	30	22.04	810.19	295.49	18.95
GYM (S)	1	4	34	36	1	4	42	26	7	50	35.20	854.02	205.32	18.97
TEX (S)	1	4	37	33	1	4	45	30	7	57	48.24	847.47	163.53	19.00
MIL (S)	1	4	41	26	1	4	48	34	7	8	12.98	852.91	444.90	19.03
GBM (S)	1	4	42	5	1	4	49	24	7	19	14.66	888.78	413.64	19.04
ANG (S)	1	4	46	37	1	4	54	17	7	39	17.83	951.67	371.78	19.08
ACN (S)	1	5	0	56	1	5	8	8	7	11	9.24	1018.39	616.18	19.21
CRO (S)	1	5	34	25	1	5	36	52	2	27	.74	1009.59	971.91	19.53
GWM (S)	1	5	43	44	1	5	52	1	8	16	73.34	929.39	135.31	19.66
HAW (S)	1	5	58	50	1	6	4	58	6	7	7.16	917.95	585.70	19.82
USS HUNTSVILLE	1	6	3	57	1	6	11	18	7	21	17.53	930.51	352.51	19.89
PIR (S)	1	6	7	54	1	6	14	17	6	22	8.37	934.25	553.73	19.93
GDS (S)	1	6	7	54	1	6	14	18	6	23	8.48	935.70	550.66	19.93
GYM (S)	1	6	9	15	1	6	16	55	7	40	25.90	946.75	267.31	19.95
TEX (S)	1	6	12	36	1	6	19	12	6	35	9.00	952.31	548.20	19.97

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites

MSFN STATION NAME	ACQUISITION DAY	HR	MIN	SEC	LOSS DAY	HR	MIN	SEC	ELAPSED TIME MIN	SEC	MAX ELEVATION DEG	MAX RANGE N MI	MIN RANGE N MI	REVOLUTION NUMBER
HAW (C)	0	2	54	54	0	3	0	43	5	49	17.22	936.15	371.65	2.85
CAL (C)	0	3	2	43	0	3	10	20	7	37	21.51	605.63	306.76	2.94
WHS (C)	0	3	5	23	0	3	13	31	8	8	33.06	776.42	218.41	2.99
MLA (C)	0	3	11	12	0	3	19	1	7	48	36.19	819.09	208.59	3.05
PAT (C)	0	3	11	14	0	3	19	3	7	48	34.27	814.72	217.73	3.05
GBI (C)	0	3	11	53	0	3	19	53	7	59	24.09	777.84	290.80	3.05
BDA (C)	0	3	14	46	0	3	22	17	7	31	16.68	579.78	386.79	3.08
BDQ (C)	0	3	14	46	0	3	22	17	7	31	16.68	579.77	386.78	3.08
ANT (C)	0	3	16	55	0	3	24	13	7	18	12.48	633.32	471.78	3.10
ASC (C)	0	3	30	31	0	3	38	52	8	21	19.98	943.47	384.35	3.24
PRE (C)	0	3	41	43	0	3	51	0	9	16	64.64	941.66	178.29	3.37
TAN (C)	0	3	46	35	0	3	53	59	7	23	8.81	816.24	668.75	3.40
CRO (C)	0	4	1	51	0	4	10	44	8	53	46.05	963.71	208.53	3.59
HAW (C)	0	4	27	42	0	4	35	35	7	52	22.51	813.05	293.79	3.83
CAL (C)	0	4	36	59	0	4	44	58	7	58	26.64	818.82	260.00	3.95
WHS (C)	0	4	40	8	0	4	48	9	8	0	44.25	895.51	177.51	3.98
MLA (C)	0	4	46	0	0	4	53	57	7	56	22.15	887.89	317.88	4.04
PAT (C)	0	4	46	2	0	4	54	0	7	57	23.17	892.46	307.12	4.04
GBI (C)	0	4	46	35	0	4	54	40	8	5	28.16	912.85	263.79	4.06
BDA (C)	0	4	51	7	0	4	54	33	3	26	1.64	951.68	876.39	4.06
BDQ (C)	0	4	51	7	0	4	54	33	3	26	1.64	951.67	876.39	4.06
ANT (C)	0	4	51	6	0	4	59	37	8	30	25.26	738.24	296.49	4.09
ASC (C)	0	5	5	7	0	5	13	36	8	29	15.11	818.51	479.87	4.22
PRE (C)	0	5	16	41	0	5	25	46	9	4	22.75	784.39	379.10	4.36
TAN (C)	0	5	22	39	0	5	28	56	6	17	5.16	975.80	803.56	4.41
CRO (C)	0	5	37	52	0	5	43	32	5	39	4.57	960.93	776.57	4.55
HAW (C)	0	6	3	24	0	6	9	56	6	32	8.35	771.06	553.02	4.82
CAL (C)	0	6	11	39	0	6	19	18	7	38	14.49	809.08	419.28	4.94
WHS (C)	0	6	14	55	0	6	22	12	7	16	12.81	687.91	457.69	4.96
MLA (C)	0	6	22	14	0	6	26	18	4	3	2.16	959.59	857.59	5.00
PAT (C)	0	6	22	13	0	6	26	24	4	11	2.32	976.93	849.09	5.02
GBI (C)	0	6	22	51	0	6	27	9	4	18	2.45	893.60	842.95	5.02
ANT (C)	0	6	27	49	0	6	31	49	4	0	2.08	938.71	889.18	5.05
ASC (C)	0	6	43	34	0	6	45	24	1	50	.70	1023.61	1023.61	5.19
PRE (C)	0	6	51	54	0	7	0	42	8	47	22.25	996.11	382.43	5.37
TAN (C)	0	6	57	27	0	7	5	3	7	35	8.84	918.46	653.48	5.42
HAW (C)	0	7	38	45	0	7	45	11	6	26	7.69	800.76	582.13	5.84
CAL (C)	0	7	47	12	0	7	52	15	5	3	3.61	812.16	768.69	5.90
PRE (C)	0	8	26	44	0	8	35	52	9	8	29.74	731.40	296.74	6.36
TAN (C)	0	8	31	50	0	8	40	42	8	51	48.37	956.61	198.92	6.41

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
HAW (C)	0	9	13	7	0	9	21	1	7	53	18.44	833.08	354.48	6.84
PRE (C)	0	10	1	44	0	10	10	7	8	22	19.89	939.64	387.78	7.34
TAN (C)	0	10	7	9	0	10	14	31	7	21	10.37	949.86	563.22	7.39
HAW (C)	0	10	47	43	0	10	55	52	8	9	24.03	834.68	303.29	7.82
HAW (C)	0	12	24	55	0	12	27	23	2	28	1.09	924.99	924.99	8.78
ASC (C)	0	13	4	18	0	13	11	46	7	28	10.87	1033.49	557.90	9.23
ASC (C)	0	14	38	32	0	14	46	58	8	25	30.39	846.38	263.98	10.23
CYI (C)	0	16	21	46	0	16	22	44	0	58	.42	920.72	920.72	11.22
CYI (C)	0	17	52	37	0	18	0	12	7	34	19.24	601.48	335.55	12.23
WOM (C)	0	18	35	53	0	18	40	35	4	41	2.79	1024.57	894.81	12.67
ANT (C)	0	19	15	59	0	19	23	33	7	33	14.75	907.50	417.74	13.11
CYI (C)	0	19	26	58	0	19	35	2	8	3	31.41	790.46	226.27	13.24
CRO (C)	0	20	3	11	0	20	10	42	7	31	9.86	996.09	609.88	13.61
WOM (C)	0	20	8	9	0	20	16	51	8	41	22.40	1018.43	377.04	13.68
MLA (C)	0	20	50	1	0	20	53	21	3	20	1.53	914.44	856.11	14.05
PAT (C)	0	20	49	54	0	20	53	28	3	33	1.74	902.18	844.85	14.05
GBI (C)	0	20	49	13	0	20	54	44	5	31	4.90	875.60	694.57	14.07
ANT (C)	0	20	50	29	0	20	58	13	7	43	22.74	569.75	297.73	14.09
BDA (C)	0	20	52	34	0	20	58	21	5	47	5.14	926.15	675.26	14.11
BDQ (C)	0	20	52	34	0	20	58	21	5	47	5.14	926.15	675.25	14.11
CYI (C)	0	21	2	1	0	21	9	48	7	46	22.60	871.00	294.04	14.24
CRO (C)	0	21	36	48	0	21	46	4	9	16	34.99	725.14	269.81	14.60
WOM (C)	0	21	42	26	0	21	51	45	9	19	42.90	772.98	233.44	14.67
MLA (C)	0	22	22	13	0	22	29	55	7	41	22.24	923.49	300.02	15.05
PAT (C)	0	22	22	12	0	22	29	55	7	43	23.30	918.61	289.34	15.05
GBI (C)	0	22	22	23	0	22	30	17	7	53	45.90	510.89	170.48	15.05
ANT (C)	0	22	27	1	0	22	31	51	4	50	3.14	775.52	757.38	15.08
BDA (C)	0	22	25	53	0	22	33	43	7	49	24.14	848.59	278.72	15.10
BDQ (C)	0	22	25	53	0	22	33	43	7	49	24.14	848.59	278.71	15.10
CYI (C)	0	22	36	41	0	22	44	46	8	5	41.11	860.92	186.09	15.24
TAN (C)	0	22	59	20	0	23	2	43	3	23	1.40	985.00	934.00	15.41
CRO (C)	0	23	11	54	0	23	20	43	8	48	22.73	1061.12	379.45	15.59
WOM (C)	0	23	17	3	0	23	26	31	9	28	73.46	1021.51	169.28	15.67
WHS (C)	0	23	52	12	0	23	58	41	6	28	8.34	729.25	557.95	15.98
MLA (C)	0	23	56	36	1	0	4	41	8	4	27.26	758.09	252.86	16.06
PAT (C)	0	23	56	37	1	0	4	41	8	3	26.68	760.79	257.24	16.06
GBI (C)	0	23	57	13	1	0	5	0	7	46	24.13	882.41	278.42	16.06
ANT (C)	1	0	4	37	1	0	5	47	1	9	.38	905.05	905.05	16.08
BDA (C)	1	0	0	17	1	0	8	23	8	6	29.45	750.62	237.86	16.11
BDQ (C)	1	0	0	17	1	0	8	23	8	6	29.45	750.62	237.86	16.11
CYI (C)	1	0	11	31	1	0	19	14	7	43	20.63	608.16	328.57	16.22
TAN (C)	1	0	30	58	1	0	39	49	8	50	35.68	994.53	254.19	16.42
CRO (C)	1	0	47	10	1	0	55	46	8	36	18.40	1017.14	440.18	16.61
WOM (C)	1	0	51	58	1	1	1	4	9	6	28.13	753.88	313.01	16.65
HAW (C)	1	1	15	30	1	1	19	30	3	59	2.13	947.54	837.07	16.84
CAL (C)	1	1	23	12	1	1	30	23	7	11	9.34	771.28	525.67	16.95
WHS (C)	1	1	25	51	1	1	33	42	7	51	32.29	883.53	220.12	17.00
MLA (C)	1	1	31	35	1	1	39	22	7	47	29.93	527.94	235.37	17.05
PAT (C)	1	1	31	36	1	1	39	23	7	46	28.37	529.01	245.59	17.05

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
GBI (C)	1	1	32	12	1	1	39	50	7	37	17.75	871.07	352.27	17.07
BDA (C)	1	1	34	57	1	1	42	59	8	1	32.03	827.62	225.77	17.10
BDQ (C)	1	1	34	57	1	1	42	59	8	1	32.03	827.62	225.76	17.10
ANT (C)	1	1	38	5	1	1	42	51	4	45	2.86	784.93	777.79	17.10
CYI (C)	1	1	48	30	1	1	50	44	2	13	1.02	907.30	907.30	17.18
ASC (C)	1	1	53	16	1	1	56	30	3	14	1.34	959.67	917.48	17.23
PRE (C)	1	2	2	38	1	2	10	48	8	10	13.33	874.12	522.84	17.36
TAN (C)	1	2	5	50	1	2	14	29	8	39	18.23	878.32	432.65	17.41
CRO (C)	1	2	22	1	1	2	30	51	8	50	33.97	1057.40	265.27	17.59
WOM (C)	1	2	27	27	1	2	34	7	6	40	7.61	809.46	644.96	17.63
HAW (C)	1	2	47	47	1	2	55	37	7	49	27.27	826.79	244.98	17.84
CAL (C)	1	2	57	11	1	3	5	18	8	7	29.81	963.89	257.11	17.96
WHS (C)	1	2	59	17	1	3	8	39	9	22	31.72	733.24	260.71	17.99
MLA (C)	1	3	5	38	1	3	14	49	9	11	32.74	712.91	280.33	18.05
PAT (C)	1	3	5	39	1	3	14	50	9	11	33.44	719.53	276.63	18.05
GBI (C)	1	3	6	17	1	3	15	28	9	11	52.41	1018.72	199.13	18.07
BDA (C)	1	3	9	13	1	3	17	31	8	17	14.58	1031.05	516.25	18.09
BDQ (C)	1	3	9	13	1	3	17	31	8	17	14.58	1031.04	516.24	18.09
ANT (C)	1	3	11	4	1	3	20	15	9	10	25.93	898.80	355.43	18.11
ASC (C)	1	3	24	45	1	3	34	53	10	8	42.31	1091.82	278.89	18.23
PRE (C)	1	3	36	37	1	3	46	41	10	4	63.44	1083.85	210.67	18.36
TAN (C)	1	3	42	1	1	3	49	39	7	37	8.26	1149.97	745.05	18.40
CRO (C)	1	3	57	35	1	4	5	52	8	16	22.45	1042.83	342.95	18.57
HAW (C)	1	4	23	33	1	4	30	39	7	8	16.07	801.82	354.89	18.82
CAL (C)	1	4	32	37	1	4	40	0	7	23	27.62	795.95	232.11	18.93
WHS (C)	1	4	35	43	1	4	43	9	7	26	28.07	883.88	230.18	18.98
MLA (C)	1	4	41	47	1	4	48	38	6	51	12.15	848.43	439.38	19.03
PAT (C)	1	4	41	48	1	4	48	42	6	53	12.53	851.16	430.98	19.03
GBI (C)	1	4	42	22	1	4	49	26	7	3	14.11	853.84	401.80	19.04
ANT (C)	1	4	46	56	1	4	54	17	7	21	15.80	923.88	383.22	19.08
ASC (C)	1	5	1	11	1	5	8	6	6	55	8.65	997.53	611.86	19.21
PRE (C)	1	5	12	14	1	5	20	42	8	27	22.41	1030.84	361.21	19.35
TAN (C)	1	5	18	7	1	5	24	14	6	6	5.22	1033.81	770.70	19.40
CRO (C)	1	5	34	47	1	5	36	40	1	52	.45	984.56	969.97	19.53
HAW (C)	1	5	58	50	1	6	4	58	6	7	7.15	917.98	585.88	19.82
CAL (C)	1	6	6	57	1	6	13	53	6	56	12.27	934.07	449.71	19.92
WHS (C)	1	6	10	24	1	6	16	37	6	13	7.48	940.21	587.31	19.95
PRE (C)	1	6	46	56	1	6	55	47	8	50	21.87	837.57	382.46	20.36
TAN (C)	1	6	52	19	1	7	0	23	8	3	13.75	980.83	512.16	20.42
HAW (C)	1	7	33	45	1	7	40	21	6	38	7.67	879.81	570.27	20.84
CAL (C)	1	7	43	39	1	7	44	56	1	16	.51	906.48	906.48	20.88
PRE (C)	1	8	21	37	1	8	30	43	9	5	78.06	966.91	159.16	21.38
TAN (C)	1	8	28	37	1	8	35	38	8	59	33.60	738.90	258.26	21.40
HAW (C)	1	9	8	2	1	9	15	54	7	51	35.59	915.51	206.01	21.83
PRE (C)	1	9	58	44	1	10	4	21	7	37	11.17	982.58	561.09	22.34
TAN (C)	1	10	2	36	1	10	8	23	5	47	4.74	944.23	757.91	22.38
HAW (C)	1	10	42	43	1	10	50	0	7	17	13.39	684.30	438.46	22.81
ASC (C)	1	11	26	2	1	11	28	52	2	50	.95	1040.47	983.02	23.23
ASC (C)	1	12	58	22	1	13	8	43	8	20	19.38	879.89	390.33	24.24

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ASC (C)	1	14	33	7	1	14	41	0	7	53	12.91	833.71	484.48	25.22
CYI (C)	1	16	13	40	1	16	18	49	5	8	4.08	901.04	738.52	26.24
ANT (C)	1	17	37	58	1	17	40	36	2	38	.74	972.81	932.75	27.10
CYI (C)	1	17	46	28	1	17	54	26	7	57	30.42	860.53	236.61	27.25
WOM (C)	1	18	28	58	1	18	35	14	6	16	6.04	867.29	724.94	27.66
ANT (C)	1	19	9	37	1	19	17	46	8	9	32.10	888.25	235.83	28.10
CYI (C)	1	19	21	3	1	19	29	1	7	58	20.94	735.19	310.91	28.24
CRO (C)	1	19	56	41	1	20	4	52	8	11	15.81	893.48	447.90	28.61
WOM (C)	1	20	1	57	1	20	10	45	8	47	32.31	1003.78	275.07	28.68
MLA (C)	1	20	42	37	1	20	48	23	5	45	5.26	895.03	684.45	29.06
PAT (C)	1	20	42	33	1	20	48	25	5	52	5.54	888.15	673.26	29.06
GBI (C)	1	20	42	17	1	20	49	12	6	54	9.99	746.34	524.15	29.06
ANT (C)	1	20	44	38	1	20	51	55	7	16	13.09	687.25	443.39	29.09
BDA (C)	1	20	45	48	1	20	52	37	6	49	8.84	899.61	546.72	29.11
BDQ (C)	1	20	45	48	1	20	52	37	6	49	8.84	899.60	546.71	29.11
CYI (C)	1	20	56	1	1	21	3	42	7	40	24.71	914.08	269.62	29.23
CRO (C)	1	21	30	42	1	21	39	46	9	3	31.20	741.72	284.37	29.59
WOM (C)	1	21	36	16	1	21	45	28	9	11	40.77	769.31	234.98	29.67
MLA (C)	1	22	15	45	1	22	23	45	7	59	37.30	886.24	200.28	30.05
PAT (C)	1	22	15	44	1	22	23	45	8	0	39.37	883.54	192.06	30.05
GBI (C)	1	22	16	6	1	22	24	3	7	57	84.22	496.21	125.53	30.05
ANT (C)	1	22	21	30	1	22	25	12	3	42	1.84	865.34	821.30	30.08
BDA (C)	1	22	19	30	1	22	27	29	7	58	30.75	825.42	229.21	30.10
BDQ (C)	1	22	19	30	1	22	27	29	7	58	30.75	825.42	229.20	30.10
CYI (C)	1	22	30	29	1	22	38	29	8	0	50.47	851.07	155.76	30.24
TAN (C)	1	22	51	37	1	22	57	31	5	54	5.24	906.86	724.41	30.41
CRO (C)	1	23	5	51	1	23	14	21	8	29	18.87	1010.95	421.71	30.61
WOM (C)	1	23	10	51	1	23	20	2	9	10	49.03	806.77	206.91	30.66
CAL (C)	1	23	44	50	1	23	48	8	3	18	1.59	932.36	853.55	30.95
WHS (C)	1	23	45	21	1	23	52	33	7	12	11.07	840.46	486.03	31.00
MLA (C)	1	23	50	21	1	23	58	12	7	50	34.81	900.17	207.36	31.07
PAT (C)	1	23	50	21	1	23	58	11	7	50	32.79	900.43	217.43	31.07
GBI (C)	1	23	50	55	1	23	58	36	7	40	17.72	824.20	350.72	31.07
ANT (C)	1	23	57	53	1	23	59	19	1	26	.29	902.65	902.65	31.07
BDA (C)	1	23	54	3	2	0	1	55	7	52	69.17	922.05	129.45	31.09
BDQ (C)	1	23	54	3	2	0	1	55	7	52	69.17	922.05	129.45	31.09
CYI (C)	2	0	5	21	2	0	12	21	6	59	10.33	891.25	498.12	31.22
PRE (C)	2	0	24	45	2	0	27	2	2	16	.98	944.46	944.46	31.35
TAN (C)	2	0	24	30	2	0	33	23	8	53	37.73	765.46	230.98	31.41
CRO (C)	2	0	40	46	2	0	49	27	8	41	16.60	807.16	461.80	31.60
WOM (C)	2	0	45	36	2	0	54	20	8	44	27.16	987.59	318.67	31.66
HAW (C)	2	1	7	49	2	1	13	59	6	10	5.85	930.85	676.39	31.83
CAL (C)	2	1	16	46	2	1	23	59	7	13	13.57	694.96	425.67	31.94
WHS (C)	2	1	19	17	2	1	27	18	8	1	28.75	776.05	239.93	31.99
MLA (C)	2	1	25	5	2	1	32	59	7	54	20.47	742.47	312.09	32.06
PAT (C)	2	1	25	7	2	1	33	0	7	52	19.63	740.73	322.18	32.
GBI (C)	2	1	25	51	2	1	33	28	7	36	20.12	882.27	315.88	32.0
BDA (C)	2	1	28	30	2	1	36	14	7	43	26.90	897.37	252.17	32.10
BDQ (C)	2	1	28	30	2	1	36	14	7	43	26.90	897.36	252.17	32.10

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ANT (C)	2	1	31	19	2	1	36	58	5	39	5.46	804.64	650.95	32.10
ASC (C)	2	1	45	31	2	1	51	19	5	48	5.34	868.28	696.87	32.23
PRE (C)	2	1	55	52	2	2	4	16	8	24	24.10	1004.88	333.26	32.38
TAN (C)	2	1	59	44	2	2	7	38	7	54	12.59	962.41	532.17	32.40
CRO (C)	2	2	15	20	2	2	24	28	9	7	64.64	962.85	172.90	32.60
WOM (C)	2	2	21	20	2	2	26	57	5	36	4.41	943.69	804.52	32.62
HAW (C)	2	2	41	6	2	2	49	22	8	16	32.91	762.96	223.79	32.83
CAL (C)	2	2	50	45	2	2	58	35	7	50	25.16	820.58	267.05	32.96
WHS (C)	2	2	53	51	2	3	1	46	7	54	54.40	880.37	146.84	32.98
MLA (C)	2	2	59	41	2	3	7	39	7	57	40.95	845.33	181.60	33.05
PAT (C)	2	2	59	43	2	3	7	41	7	57	43.70	851.31	172.94	33.05
GBI (C)	2	3	0	18	2	3	8	15	7	56	66.68	899.00	132.08	33.07
BDA (C)	2	3	3	41	2	3	9	29	5	48	5.74	860.68	643.73	33.07
BDQ (C)	2	3	3	41	2	3	9	29	5	48	5.74	860.68	643.73	33.07
ANT (C)	2	3	4	56	2	3	13	0	8	4	25.15	761.59	270.79	33.10
ASC (C)	2	3	18	33	2	3	27	12	8	38	35.51	783.93	230.84	33.23
PRE (C)	2	3	30	9	2	3	39	6	8	57	37.95	847.76	242.16	33.37
TAN (C)	2	3	35	46	2	3	42	1	6	15	4.93	1000.14	796.56	33.39
CRO (C)	2	3	50	22	2	3	58	18	7	56	13.88	978.86	499.82	33.58
HAW (C)	2	4	16	23	2	4	23	32	7	8	12.50	658.60	445.84	33.82
CAL (C)	2	4	25	11	2	4	32	55	7	43	17.49	758.57	349.40	33.95
WHS (C)	2	4	28	23	2	4	35	57	7	33	22.12	573.01	292.60	33.97
MLA (C)	2	4	34	48	2	4	41	2	6	13	7.30	782.21	590.72	34.03
PAT (C)	2	4	34	48	2	4	41	6	6	17	7.58	769.88	581.40	34.03
GBI (C)	2	4	35	22	2	4	41	51	6	28	8.04	805.87	566.51	34.03
ANT (C)	2	4	40	4	2	4	46	42	6	38	8.01	935.24	584.95	34.08
ASC (C)	2	4	54	47	2	5	0	27	5	39	4.36	975.33	790.15	34.22
PRE (C)	2	5	5	5	2	5	13	46	8	40	19.27	858.42	414.36	34.36
TAN (C)	2	5	10	55	2	5	17	37	6	42	6.65	883.90	729.70	34.40
HAW (C)	2	5	52	0	2	5	58	2	6	2	5.72	911.12	639.25	34.82
CAL (C)	2	6	0	5	2	6	6	25	6	19	7.18	866.91	587.03	34.93
WHS (C)	2	6	3	52	2	6	8	44	4	52	3.70	891.16	728.26	34.95
PRE (C)	2	6	39	57	2	6	48	50	8	53	28.72	1032.44	308.12	35.37
TAN (C)	2	6	45	3	2	6	53	39	8	35	18.36	859.31	421.60	35.41
HAW (C)	2	7	26	36	2	7	33	35	6	58	11.59	654.52	457.27	35.83
PRE (C)	2	8	14	29	2	8	23	33	9	4	29.21	723.27	300.36	36.35
TAN (C)	2	8	19	36	2	8	28	16	8	40	32.46	974.62	267.56	36.40
HAW (C)	2	9	0	46	2	9	8	50	8	3	34.37	781.61	207.55	36.83
PRE (C)	2	9	50	4	2	9	56	31	6	26	5.88	1040.81	732.62	37.33
TAN (C)	2	9	57	5	2	9	59	25	2	19	1.00	951.09	951.09	37.35
HAW (C)	2	10	36	6	2	10	42	11	6	4	5.78	926.29	652.73	37.81
ASC (C)	2	11	17	48	2	11	23	14	5	26	3.80	1008.43	837.79	38.23
ASC (C)	2	12	50	53	2	12	59	43	8	49	32.58	793.71	261.12	39.23
ASC (C)	2	14	26	24	2	14	33	7	6	42	7.69	818.06	637.56	40.21
CYI (C)	2	16	5	30	2	16	12	7	6	36	7.67	939.50	604.58	41.25
ANT (C)	2	17	29	4	2	17	34	50	5	46	5.18	863.26	721.05	42.11
CYI (C)	2	17	39	0	2	17	47	13	8	12	27.44	734.42	256.47	42.24
CRO (C)	2	18	17	23	2	18	20	50	3	26	1.25	923.40	915.55	42.59
WOM (C)	2	18	20	57	2	18	28	14	7	16	9.73	1007.37	587.05	42.68

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - *Continued*
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
BDA (C)	2	19	6	20	2	19	8	51	2	30	.98	899.29	899.29	43.09
BDQ (C)	2	19	6	20	2	19	8	51	2	30	.98	899.28	899.28	43.09
ANT (C)	2	19	2	9	2	19	10	26	8	16	63.77	879.82	147.42	43.11
CYI (C)	2	19	13	50	2	19	21	39	7	48	26.49	892.55	257.74	43.23
CRO (C)	2	19	49	0	2	19	57	35	8	35	22.57	779.93	346.95	43.60
WOM (C)	2	19	54	24	2	20	3	22	8	57	33.81	784.95	260.97	43.67
MLA (C)	2	20	34	28	2	20	41	27	6	58	10.36	707.61	519.52	44.05
PAT (C)	2	20	34	26	2	20	41	29	7	2	10.81	700.65	507.68	44.05
GBI (C)	2	20	34	23	2	20	42	1	7	37	17.45	636.44	374.46	44.05
BDA (C)	2	20	38	1	2	20	45	25	7	24	14.97	943.27	405.76	44.10
BDQ (C)	2	20	38	1	2	20	45	25	7	24	14.97	943.27	405.76	44.10
ANT (C)	2	20	37	40	2	20	44	16	6	36	7.35	901.31	604.77	44.10
CYI (C)	2	20	48	33	2	20	56	18	7	45	26.63	874.88	252.99	44.25
CRO (C)	2	21	23	25	2	21	32	11	8	46	31.99	1027.92	274.25	44.61
WON (C)	2	21	28	49	2	21	37	56	9	7	41.19	779.40	231.75	44.66
WHS (C)	2	22	5	8	2	22	9	29	4	21	2.54	849.49	810.90	44.98
MLA (C)	2	22	8	13	2	22	16	16	8	2	62.64	892.88	141.34	45.07
PAT (C)	2	22	8	13	2	22	16	16	8	3	64.93	892.52	138.71	45.07
GBI (C)	2	22	8	34	2	22	16	41	8	7	33.82	809.56	218.31	45.07
ANT (C)	2	22	14	57	2	22	17	23	2	25	1.16	860.28	860.28	45.07
BDA (C)	2	22	12	4	2	22	19	58	7	53	54.44	939.45	150.11	45.10
BDQ (C)	2	22	12	4	2	22	19	58	7	53	54.44	939.45	150.11	45.10
CYI (C)	2	22	23	3	2	22	31	1	7	58	24.50	731.66	269.09	45.23
TAN (C)	2	22	43	24	2	22	50	38	7	13	9.46	903.41	563.65	45.42
CRO (C)	2	22	58	31	2	23	6	57	8	25	16.03	895.19	465.59	45.60
WOM (C)	2	23	3	25	2	23	12	34	9	9	74.46	952.45	163.36	45.67
CAL (C)	2	23	36	2	2	23	41	21	5	19	4.17	951.67	732.70	45.94
WHS (C)	2	23	37	34	2	23	45	15	7	40	17.20	855.03	365.19	45.99
MLA (C)	2	23	42	53	2	23	50	48	7	55	22.23	778.36	296.79	46.06
PAT (C)	2	23	42	55	2	23	50	48	7	53	21.33	778.79	306.47	46.06
GBI (C)	2	23	43	36	2	23	51	11	7	35	16.55	844.44	366.54	46.06
ANT (C)	2	23	50	9	2	23	52	48	2	38	.99	859.02	859.02	46.09
BDA (C)	2	23	46	28	2	23	54	24	7	56	46.60	854.76	164.02	46.11
BDQ (C)	2	23	46	28	2	23	54	24	7	56	46.60	854.76	164.02	46.11
CYI (C)	2	23	58	21	3	0	4	12	5	51	5.56	906.50	648.17	46.21
PRE (C)	3	0	15	32	3	0	20	58	5	25	4.37	898.51	761.17	46.36
TAN (C)	3	0	17	2	3	0	25	45	8	42	31.25	778.53	266.57	46.40
CRO (C)	3	0	33	17	3	0	42	1	8	44	22.79	900.09	367.18	46.59
WOM (C)	3	0	38	12	3	0	46	34	8	21	17.89	946.45	431.93	46.65
HAW (C)	3	0	59	36	3	1	7	0	7	24	11.55	895.83	496.29	46.84
CAL (C)	3	1	8	58	3	1	16	34	7	36	15.98	831.95	384.49	46.96
WHS (C)	3	1	11	47	3	1	19	45	7	58	51.81	878.32	153.58	46.98
MLA (C)	3	1	17	38	3	1	25	32	7	53	32.34	837.87	215.94	47.05
PAT (C)	3	1	17	40	3	1	25	33	7	52	31.54	844.87	220.29	47.05
GBI (C)	3	1	18	19	3	1	25	59	7	40	26.60	553.02	252.38	47.05
BDA (C)	3	1	21	3	3	1	28	32	7	29	16.38	830.79	364.36	47.10
BDQ (C)	3	1	21	3	3	1	28	32	7	29	16.38	830.79	364.35	47.10
ANT (C)	3	1	23	31	3	1	29	56	6	25	7.78	820.13	561.62	47.10
ASC (C)	3	1	37	16	3	1	44	25	7	9	10.34	913.93	517.79	47.24

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
PRE (C)	3	1	48	10	3	1	56	49	8	39	39.27	885.60	223.92	47.37
TAN (C)	3	1	52	37	3	1	59	53	7	16	9.28	780.36	615.38	47.39
CRO (C)	3	2	7	50	3	2	16	56	9	5	58.93	1009.01	181.47	47.59
WOM (C)	3	2	15	5	3	2	18	0	2	55	1.13	971.30	971.30	47.59
HAW (C)	3	2	33	37	3	2	41	45	8	8	37.86	874.47	202.67	47.83
CAL (C)	3	2	43	8	3	2	51	2	7	54	20.73	744.40	308.75	47.95
WHS (C)	3	2	46	16	3	2	54	4	7	48	53.11	524.18	148.53	47.97
MLA (C)	3	2	52	12	3	2	59	53	7	41	30.09	532.82	228.30	48.04
PAT (C)	3	2	52	13	3	2	59	55	7	42	31.58	522.34	219.65	48.04
GBI (C)	3	2	52	45	3	3	0	38	7	52	29.07	814.38	234.74	48.06
BDA (C)	3	2	56	54	3	3	0	54	4	0	2.18	824.97	796.34	48.06
BDQ (C)	3	2	56	54	3	3	0	54	4	0	2.18	824.96	796.34	48.06
ANT (C)	3	2	57	23	3	3	5	26	8	3	33.83	779.04	211.84	48.10
ASC (C)	3	3	11	11	3	3	19	24	8	13	19.00	787.79	372.09	48.22
PRE (C)	3	3	22	38	3	3	31	28	8	49	23.17	768.19	348.41	48.36
TAN (C)	3	3	28	33	3	3	34	31	5	58	4.65	988.74	805.49	48.41
CRO (C)	3	3	43	9	3	3	50	6	6	57	7.68	1017.88	675.24	48.57
HAW (C)	3	4	9	4	3	4	15	50	6	46	9.46	766.07	524.77	48.82
CAL (C)	3	4	17	39	3	4	25	9	7	30	16.98	841.25	354.06	48.94
WHS (C)	3	4	20	52	3	4	28	3	7	10	14.32	688.16	397.20	48.96
MLA (C)	3	4	27	53	3	4	32	28	4	35	3.22	891.17	747.69	49.02
PAT (C)	3	4	27	52	3	4	32	33	4	41	3.39	889.28	739.57	49.02
GBI (C)	3	4	28	28	3	4	33	19	4	50	3.35	772.45	741.89	49.02
ANT (C)	3	4	33	19	3	4	38	6	4	47	3.39	941.06	756.82	49.07
ASC (C)	3	4	48	38	3	4	51	37	2	59	1.35	929.96	929.96	49.19
PRE (C)	3	4	57	37	3	5	6	9	8	32	20.64	1037.59	390.59	49.38
TAN (C)	3	5	3	13	3	5	10	24	7	11	7.77	995.08	684.67	49.42
HAW (C)	3	5	44	30	3	5	50	37	6	7	6.65	828.06	601.40	49.84
CAL (C)	3	5	52	49	3	5	58	8	5	19	4.50	906.38	683.28	49.92
WHS (C)	3	5	57	38	3	5	59	8	1	30	.58	881.27	881.27	49.92
PRE (C)	3	6	32	15	3	6	41	17	9	1	31.35	802.17	285.92	50.36
TAN (C)	3	6	37	16	3	6	46	6	8	49	31.41	1028.08	281.76	50.42
HAW (C)	3	7	18	50	3	7	26	5	7	15	14.87	912.05	386.87	50.85
PRE (C)	3	8	6	50	3	8	15	40	8	49	23.77	801.85	347.84	51.34
TAN (C)	3	8	12	7	3	8	20	15	8	7	17.18	983.28	431.10	51.40
HAW (C)	3	8	53	7	3	9	1	2	7	54	22.18	730.53	289.38	51.83
PRE (C)	3	9	43	15	3	9	47	33	4	17	2.27	946.76	900.09	52.30
HAW (C)	3	10	29	21	3	10	33	11	3	50	1.94	838.55	816.85	52.79
ASC (C)	3	11	9	22	3	11	16	21	6	58	7.16	985.18	697.14	53.25
ASC (C)	3	12	43	0	3	12	51	53	8	53	46.01	816.54	201.97	54.22
ASC (C)	3	14	19	31	3	14	24	16	4	44	3.01	965.26	835.67	55.20
CYI (C)	3	15	57	3	3	16	4	34	7	31	12.71	858.07	469.34	56.25
ANT (C)	3	17	20	19	3	17	27	35	7	16	10.96	715.35	531.50	57.10
CYI (C)	3	17	31	2	3	17	39	18	8	15	29.97	747.65	240.69	57.24
CRO (C)	3	18	8	9	3	18	13	56	5	47	4.54	758.46	738.78	57.59
WOM (C)	3	18	12	35	3	18	20	27	7	52	14.71	955.71	457.36	57.68
MLA (C)	3	18	55	57	3	18	56	9	0	12	.08	972.71	972.71	58.05
PAT (C)	3	18	55	38	3	18	56	20	0	42	.28	961.10	961.10	58.05
GBI (C)	3	18	53	42	3	18	58	20	4	38	3.01	936.57	813.74	58.07

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
BDA (C)	3	18	56	57	3	19	2	9	5	11	3.91	944.82	755.31	58.11
BDQ (C)	3	18	56	57	3	19	2	9	5	11	3.91	944.82	755.30	58.11
ANT (C)	3	18	54	12	3	19	2	25	8	13	35.98	886.95	220.78	58.11
CYI (C)	3	19	5	58	3	19	13	42	7	44	24.63	919.89	273.55	58.23
CRO (C)	3	19	41	0	3	19	49	39	8	38	41.51	966.30	210.92	58.60
WOM (C)	3	19	46	26	3	19	55	18	8	51	68.55	967.17	160.37	58.68
MLA (C)	3	20	26	22	3	20	32	43	6	20	9.67	807.08	437.03	59.06
PAT (C)	3	20	26	20	3	20	32	44	6	23	10.11	803.46	425.93	59.06
GBI (C)	3	20	26	26	3	20	33	19	6	53	17.55	804.44	287.85	59.06
BDA (C)	3	20	29	56	3	20	36	31	6	35	14.52	688.48	324.94	59.09
BDQ (C)	3	20	29	56	3	20	36	31	6	35	14.52	688.48	324.93	59.09
ANT (C)	3	20	30	44	3	20	34	46	4	2	2.82	792.24	663.35	59.09
CYI (C)	3	20	40	41	3	20	47	29	6	48	20.62	658.52	246.13	59.24
CRO (C)	3	21	14	56	3	21	23	30	8	33	22.30	874.08	354.39	59.60
WOM (C)	3	21	20	16	3	21	29	11	8	55	64.83	951.95	166.38	59.68
WHS (C)	3	21	56	2	3	22	0	18	4	16	3.22	750.34	654.82	59.97
MLA (C)	3	21	59	39	3	22	6	38	6	58	31.47	621.23	175.36	60.04
PAT (C)	3	21	59	39	3	22	6	38	6	58	30.49	622.83	179.92	60.04
GBI (C)	3	22	0	13	3	22	6	59	6	46	14.99	742.97	315.26	60.07
BDA (C)	3	22	3	21	3	22	10	23	7	1	52.07	541.18	116.75	60.09
BDQ (C)	3	22	3	21	3	22	10	23	7	1	52.07	541.18	116.75	60.09
CYI (C)	3	22	14	21	3	22	21	16	6	54	16.50	756.13	304.86	60.23
TAN (C)	3	22	33	46	3	22	41	30	7	43	18.60	820.63	365.60	60.40
CRO (C)	3	22	49	23	3	22	57	29	8	5	15.76	977.35	458.56	60.59
WOM (C)	3	22	54	12	3	23	2	56	8	43	57.23	947.51	175.12	60.66
CAL (C)	3	23	26	28	3	23	31	19	4	51	4.54	801.55	593.86	60.93
WHS (C)	3	23	28	17	3	23	34	54	6	36	21.58	754.75	236.94	60.98
MLA (C)	3	23	33	49	3	23	40	24	6	35	19.26	645.20	255.76	61.04
PAT (C)	3	23	33	51	3	23	40	24	6	33	18.21	646.09	267.23	61.04
GBI (C)	3	23	34	32	3	23	40	46	6	14	13.33	786.75	335.72	61.06
BDA (C)	3	23	37	12	3	23	44	1	6	48	48.28	739.12	123.57	61.09
BDQ (C)	3	23	37	12	3	23	44	1	6	48	48.28	739.12	123.57	61.09
CYI (C)	3	23	49	32	3	23	52	54	3	22	1.63	831.62	757.92	61.19
PRE (C)	4	0	4	50	4	0	11	26	6	36	7.85	864.80	611.44	61.35
TAN (C)	4	0	7	16	4	0	15	31	8	14	24.21	893.77	318.65	61.40
CRO (C)	4	0	23	23	4	0	31	53	8	29	27.26	976.62	303.14	61.60
WOM (C)	4	0	28	27	4	0	35	50	7	22	11.36	981.06	528.40	61.64
HAW (C)	4	0	49	32	4	0	56	17	6	44	16.31	846.01	319.98	61.83
CAL (C)	4	0	59	2	4	1	5	32	6	29	17.38	686.69	278.21	61.93
WHS (C)	4	1	1	52	4	1	8	38	6	46	42.23	626.51	134.72	61.97
MLA (C)	4	1	7	39	4	1	14	27	6	48	36.12	803.94	155.04	62.04
PAT (C)	4	1	7	41	4	1	14	29	6	47	33.46	637.42	164.92	62.04
GBI (C)	4	1	8	18	4	1	15	2	6	44	27.47	743.16	194.98	62.05
BDA (C)	4	1	11	6	4	1	17	15	6	9	10.53	715.48	401.98	62.08
BDQ (C)	4	1	11	6	4	1	17	15	6	9	10.53	715.48	401.98	62.08
ANT (C)	4	1	13	13	4	1	19	15	6	2	8.94	733.07	452.54	62.10
ASC (C)	4	1	26	25	4	1	33	53	7	27	18.78	911.54	333.93	62.23
PRE (C)	4	1	37	25	4	1	46	1	8	36	74.08	948.17	149.35	62.36
TAN (C)	4	1	42	20	4	1	48	56	6	36	6.88	983.02	689.14	62.40

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
CRO (C)	4	1	57	16	4	2	5	42	8	25	39.51	964.63	217.55	62.59
HAW (C)	4	2	23	17	4	2	29	58	6	40	19.47	763.42	263.58	62.82
CAL (C)	4	2	32	34	4	2	39	12	6	38	26.81	784.82	194.90	62.94
WHS (C)	4	2	35	37	4	2	42	21	6	43	34.33	792.25	159.61	62.97
MLA (C)	4	2	41	27	4	2	48	0	6	32	16.34	773.99	303.98	63.04
PAT (C)	4	2	41	28	4	2	48	3	6	34	17.01	775.48	294.98	63.04
GBI (C)	4	2	42	2	4	2	48	45	6	42	19.30	830.33	270.74	63.05
ANT (C)	4	2	46	30	4	2	53	36	7	6	28.04	801.81	211.59	63.08
ASC (C)	4	2	59	23	4	3	7	39	8	15	11.64	853.33	498.43	63.22
PRE (C)	4	3	11	22	4	3	19	57	8	35	18.89	775.02	397.40	63.36
TAN (C)	4	3	17	27	4	3	23	4	5	37	4.22	969.52	805.77	63.41
CRO (C)	4	3	32	35	4	3	37	21	4	45	3.18	976.99	800.24	63.55
HAW (C)	4	3	58	16	4	4	3	15	4	58	5.00	748.72	557.92	63.83
CAL (C)	4	4	6	16	4	4	12	31	6	14	10.69	732.51	390.00	63.92
WHS (C)	4	4	9	33	4	4	15	25	5	52	8.32	698.97	459.25	63.96
GBI (C)	4	4	18	34	4	4	18	46	0	11	.09	847.40	847.40	64.00
PRE (C)	4	4	45	37	4	4	54	4	8	27	17.36	827.18	425.84	64.36
TAN (C)	4	4	51	10	4	4	58	21	7	11	9.25	782.15	605.88	64.41
HAW (C)	4	5	32	42	4	5	37	30	4	47	4.37	680.50	579.36	64.83
CAL (C)	4	5	41	37	4	5	43	46	2	8	1.21	753.46	753.46	64.89
PRE (C)	4	6	19	29	4	6	28	18	8	49	34.56	788.60	247.61	65.35
TAN (C)	4	6	24	38	4	6	33	7	8	28	44.79	1011.12	196.09	65.41
HAW (C)	4	7	5	57	4	7	12	30	6	33	14.22	669.58	325.34	65.82
PRE (C)	4	7	53	35	4	8	1	38	8	3	14.91	806.85	440.41	66.34
TAN (C)	4	7	59	5	4	8	5	55	6	50	9.37	725.21	551.05	66.38
HAW (C)	4	8	39	29	4	8	46	26	6	56	20.35	589.76	261.01	66.81
ASC (C)	4	10	54	24	4	11	1	27	7	3	9.06	955.10	572.92	68.24
ASC (C)	4	12	27	40	4	12	35	45	8	4	22.87	773.21	295.08	69.22
CYI (C)	4	15	40	8	4	15	46	47	6	38	11.89	801.69	394.03	71.24
WOM (C)	4	16	23	40	4	16	25	56	2	16	1.05	899.71	899.71	71.65
ANT (C)	4	17	2	38	4	17	9	23	6	44	11.29	904.27	433.61	72.11
CYI (C)	4	17	13	33	4	17	20	34	7	1	30.66	608.93	181.43	72.22
CRO (C)	4	17	49	26	4	17	55	49	6	22	7.42	792.03	610.23	72.60
WOM (C)	4	17	54	5	4	18	2	7	8	1	17.08	858.46	407.41	72.66
PAT (C)	4	18	36	32	4	18	36	54	0	21	.15	860.53	860.53	73.04
GBI (C)	4	18	35	16	4	18	39	21	4	5	2.60	767.14	727.35	73.06
BDA (C)	4	18	38	29	4	18	42	59	4	30	3.57	829.88	655.84	73.10
BDQ (C)	4	18	38	29	4	18	42	59	4	30	3.57	829.87	655.83	73.10
ANT (C)	4	18	36	6	4	18	43	7	7	0	14.11	769.01	350.86	73.10
CYI (C)	4	18	47	41	4	18	54	19	6	38	16.81	622.05	283.15	73.23
CRO (C)	4	19	21	50	4	19	30	25	8	35	42.48	796.50	202.71	73.59
WOM (C)	4	19	27	16	4	19	36	8	8	51	30.40	712.97	271.31	73.67
MLA (C)	4	20	6	59	4	20	13	50	6	50	17.01	597.85	302.65	74.05
PAT (C)	4	20	6	57	4	20	13	51	6	53	17.89	593.52	291.36	74.05
GBI (C)	4	20	7	5	4	20	14	18	7	12	35.56	528.17	168.08	74.05
ANT (C)	4	20	12	5	4	20	15	18	3	12	1.24	761.87	744.65	74.08
BDA (C)	4	20	10	44	4	20	17	31	6	47	18.71	642.46	269.71	74.10
BDQ (C)	4	20	10	44	4	20	17	31	6	47	18.71	642.45	269.70	74.10
CYI (C)	4	20	21	26	4	20	28	21	6	54	32.12	554.44	167.10	74.23

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
CRO (C)	4	20	55	53	4	21	4	13	8	19	18.44	850.20	399.69	74.59
WOM (C)	4	21	1	5	4	21	10	0	8	55	33.73	742.48	256.04	74.67
WHS (C)	4	21	36	19	4	21	41	32	5	13	5.31	796.53	578.95	74.98
MLA (C)	4	21	40	35	4	21	47	33	6	58	27.91	817.82	193.51	75.06
PAT (C)	4	21	40	36	4	21	47	33	6	57	26.93	820.12	199.26	75.06
GBI (C)	4	21	41	2	4	21	47	52	6	49	20.46	567.06	248.87	75.06
BDA (C)	4	21	44	14	4	21	51	9	6	54	20.28	731.56	244.56	75.11
BDQ (C)	4	21	44	14	4	21	51	9	6	54	20.28	731.56	244.55	75.11
CYI (C)	4	21	55	13	4	22	1	54	6	41	17.78	579.22	276.25	75.22
TAN (C)	4	22	14	27	4	22	21	22	6	55	24.28	926.86	288.06	75.41
CRO (C)	4	22	30	11	4	22	38	17	8	6	15.33	931.39	460.08	75.59
WOM (C)	4	22	34	55	4	22	43	41	8	46	33.72	797.55	254.91	75.66
HAW (C)	4	23	0	34	4	23	0	41	0	7	.04	883.82	883.82	75.83
CAL (C)	4	23	6	51	4	23	12	17	5	25	5.26	580.31	575.79	75.93
WHS (C)	4	23	8	52	4	23	15	48	6	55	25.35	579.16	209.58	75.98
MLA (C)	4	23	14	37	4	23	21	13	6	36	15.98	801.08	292.63	76.06
PAT (C)	4	23	14	39	4	23	21	13	6	34	15.50	807.71	299.18	76.06
GBI (C)	4	23	15	14	4	23	21	38	6	24	13.24	618.42	334.69	76.06
BDA (C)	4	23	17	53	4	23	24	39	6	46	23.85	649.69	212.87	76.08
BDQ (C)	4	23	17	53	4	23	24	39	6	46	23.85	649.70	212.87	76.08
ANT (C)	4	23	22	14	4	23	23	11	0	57	.49	768.99	768.99	76.08
PRE (C)	4	23	45	15	4	23	51	17	6	2	10.54	943.22	514.32	76.36
TAN (C)	4	23	48	8	4	23	56	6	7	57	18.63	856.48	372.95	76.40
CRO (C)	5	0	3	59	5	0	12	36	8	36	31.33	894.03	269.59	76.59
WOM (C)	5	0	9	15	5	0	16	14	6	59	9.06	779.52	596.98	76.63
HAW (C)	5	0	29	55	5	0	37	7	7	12	16.71	747.96	324.09	76.84
CAL (C)	5	0	39	32	5	0	46	12	6	40	20.06	800.11	251.26	76.93
WHS (C)	5	0	42	32	5	0	49	17	6	44	70.65	795.13	96.93	76.97
MLA (C)	5	0	48	21	5	0	55	13	6	51	60.83	798.91	104.45	77.05
PAT (C)	5	0	48	23	5	0	55	15	6	51	55.82	786.30	110.04	77.05
GBI (C)	5	0	49	1	5	0	55	47	6	45	31.53	797.24	169.59	77.05
BDA (C)	5	0	51	57	5	0	57	39	5	42	7.25	798.32	478.62	77.07
BDQ (C)	5	0	51	57	5	0	57	39	5	42	7.25	798.32	478.62	77.07
ANT (C)	5	0	53	48	5	1	0	2	6	13	9.85	829.13	411.67	77.11
ASC (C)	5	1	6	51	5	1	14	39	7	48	24.94	828.37	261.05	77.24
PRE (C)	5	1	18	3	5	1	26	45	8	42	69.25	891.58	154.38	77.37
TAN (C)	5	1	23	10	5	1	29	36	6	26	6.11	890.06	727.86	77.39
CRO (C)	5	1	37	52	5	1	46	29	8	36	28.91	1016.82	293.43	77.59
HAW (C)	5	2	4	6	5	2	10	47	6	41	13.88	677.61	346.45	77.83
CAL (C)	5	2	13	13	5	2	19	56	6	43	20.39	647.29	242.32	77.93
WHS (C)	5	2	16	19	5	2	23	8	6	49	27.24	580.69	189.38	77.98
MLA (C)	5	2	22	20	5	2	28	32	6	11	10.19	733.05	406.35	78.04
PAT (C)	5	2	22	21	5	2	28	36	6	15	10.69	721.36	394.83	78.04
GBI (C)	5	2	22	52	5	2	29	22	6	29	13.88	583.80	332.76	78.04
ANT (C)	5	2	27	20	5	2	34	8	6	47	15.10	844.59	328.30	78.09
ASC (C)	5	2	41	14	5	2	48	4	6	50	8.83	980.21	562.34	78.23
PRE (C)	5	2	52	12	5	3	0	46	8	33	21.85	910.21	366.06	78.37
TAN (C)	5	2	58	6	5	3	4	8	6	1	4.34	1032.66	819.50	78.42
CRO (C)	5	3	13	50	5	3	17	28	3	37	1.77	990.92	898.55	78.54

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
HAW (C)	5	3	39	17	5	3	44	7	4	49	4.45	787.89	582.30	78.83
CAL (C)	5	3	47	12	5	3	53	13	6	0	9.96	648.26	399.40	78.93
WHS (C)	5	3	50	41	5	3	55	50	5	9	5.04	594.87	557.13	78.95
PRE (C)	5	4	26	25	5	4	35	6	8	40	19.61	841.13	404.11	79.37
TAN (C)	5	4	31	50	5	4	39	36	7	46	11.66	1012.76	557.48	79.41
HAW (C)	5	5	13	39	5	5	18	36	4	57	5.06	736.73	547.07	79.83
PRE (C)	5	6	0	21	5	6	9	26	9	5	33.91	735.00	265.54	80.36
TAN (C)	5	6	5	23	5	6	14	13	8	50	75.29	961.36	153.33	80.41
HAW (C)	5	6	46	57	5	6	53	40	6	43	20.10	582.68	244.22	80.82
PRE (C)	5	7	34	39	5	7	42	36	7	57	13.58	895.57	497.89	81.34
TAN (C)	5	7	40	20	5	7	46	45	6	24	6.68	857.32	666.54	81.38
HAW (C)	5	8	20	50	5	8	27	20	6	30	13.45	589.20	343.44	81.81
ASC (C)	5	10	35	15	5	10	43	11	7	56	13.39	884.84	485.36	83.24
ASC (C)	5	12	9	1	5	12	17	6	8	4	17.29	805.49	385.08	84.22
CYI (C)	5	13	50	2	5	13	52	53	2	50	1.21	907.47	822.25	85.22
CYI (C)	5	15	21	29	5	15	28	37	7	8	15.83	780.30	330.22	86.24
WOM (C)	5	16	4	4	5	16	8	29	4	24	2.75	916.63	804.36	86.66
ANT (C)	5	16	43	56	5	16	51	24	7	27	19.54	924.18	315.69	87.10
CYI (C)	5	16	55	16	5	17	2	19	7	2	19.60	757.04	269.45	87.24
CRO (C)	5	17	30	45	5	17	37	44	6	58	10.53	700.22	509.41	87.59
WOM (C)	5	17	35	38	5	17	43	51	8	12	23.02	887.59	328.52	87.66
MLA (C)	5	18	16	56	5	18	20	40	3	43	1.93	808.51	790.76	88.05
PAT (C)	5	18	16	50	5	18	20	44	3	54	2.17	798.38	778.41	88.05
GBI (C)	5	18	16	13	5	18	21	46	5	32	4.73	659.86	644.56	88.05
BDA (C)	5	18	19	41	5	18	25	12	5	31	5.76	827.44	588.62	88.10
BDQ (C)	5	18	19	41	5	18	25	12	5	31	5.76	827.43	588.61	88.10
ANT (C)	5	18	18	1	5	18	24	56	6	54	13.76	898.43	374.66	88.10
CYI (C)	5	18	29	33	5	18	36	5	6	31	13.38	787.96	337.70	88.24
CRO (C)	5	19	3	40	5	19	12	10	8	29	61.27	992.43	158.51	88.61
WOM (C)	5	19	9	2	5	19	17	55	8	52	44.91	795.85	207.44	88.66
MLA (C)	5	19	48	36	5	19	55	50	7	13	24.03	593.76	243.18	89.05
PAT (C)	5	19	48	35	5	19	55	50	7	14	25.44	588.39	232.30	89.05
GBI (C)	5	19	48	49	5	19	56	12	7	22	31.98	802.55	193.04	89.07
ANT (C)	5	19	54	34	5	19	56	50	2	16	1.10	768.08	768.08	89.07
BDA (C)	5	19	52	24	5	19	59	31	7	6	28.45	515.08	199.59	89.10
BDQ (C)	5	19	52	24	5	19	59	31	7	6	28.45	515.08	199.58	89.10
CYI (C)	5	20	3	24	5	20	10	10	6	46	21.86	768.51	226.07	89.24
TAN (C)	5	20	25	35	5	20	28	4	2	29	.69	904.74	847.82	89.41
CRO (C)	5	20	37	55	5	20	46	5	8	10	18.65	1027.73	401.41	89.61
WOM (C)	5	20	42	53	5	20	51	55	9	1	43.95	793.55	216.59	89.66
WHS (C)	5	21	17	50	5	21	23	49	5	58	6.99	846.15	541.91	89.97
MLA (C)	5	21	22	27	5	21	29	36	7	8	35.17	516.37	165.58	90.05
PAT (C)	5	21	22	28	5	21	29	35	7	7	32.65	520.90	175.84	90.05
GBI (C)	5	21	23	3	5	21	29	50	6	46	16.39	656.11	304.39	90.05
BDA (C)	5	21	26	11	5	21	33	14	7	2	49.97	555.54	120.84	90.10
BDQ (C)	5	21	26	11	5	21	33	14	7	2	49.97	555.54	120.84	90.10
CYI (C)	5	21	37	24	5	21	43	37	6	12	11.38	678.43	367.42	90.21
TAN (C)	5	21	56	17	5	22	4	18	8	0	41.90	923.27	183.54	90.42
CRO (C)	5	22	12	10	5	22	20	27	8	16	17.02	968.39	440.30	90.61

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
WOM (C)	5	22	16	48	5	22	25	42	8	54	28.22	790.28	303.40	90.65
HAW (C)	5	22	39	57	5	22	44	18	4	21	2.82	923.89	766.90	90.84
CAL (C)	5	22	48	31	5	22	54	37	6	6	8.62	727.35	473.44	90.95
WHS (C)	5	22	50	47	5	22	57	52	7	5	29.64	595.65	191.54	90.97
MLA (C)	5	22	56	36	5	23	3	25	6	48	22.60	527.70	224.64	91.05
PAT (C)	5	22	56	38	5	23	3	25	6	47	21.31	536.05	235.55	91.05
GBI (C)	5	22	57	21	5	23	3	46	6	24	12.67	687.50	347.06	91.05
BDA (C)	5	23	0	5	5	23	6	48	6	42	21.92	645.04	225.37	91.10
BDQ (C)	5	23	0	5	5	23	6	48	6	42	21.92	645.03	225.36	91.10
ANT (C)	5	23	3	40	5	23	6	19	2	39	.69	759.86	751.73	91.10
PRE (C)	5	23	27	2	5	23	34	29	7	27	13.26	898.64	441.78	91.37
TAN (C)	5	23	30	24	5	23	38	1	7	37	14.39	650.64	444.97	91.39
CRO (C)	5	23	46	2	5	23	54	57	8	54	38.16	848.42	241.60	91.60
WOM (C)	5	23	51	26	5	23	58	5	6	38	6.53	1003.56	711.24	91.64
HAW (C)	6	0	11	57	6	0	19	31	7	33	42.26	897.72	161.77	91.83
CAL (C)	6	0	21	40	6	0	28	29	6	48	15.93	769.68	302.29	91.95
WHS (C)	6	0	24	34	6	0	31	37	7	2	66.86	512.30	100.41	91.98
MLA (C)	6	0	30	26	6	0	37	23	6	57	70.92	514.07	95.14	92.05
PAT (C)	6	0	30	27	6	0	37	25	6	57	74.00	507.53	93.58	92.05
GBI (C)	6	0	31	5	6	0	37	55	6	50	31.95	606.17	164.92	92.05
BDA (C)	6	0	34	22	6	0	39	26	5	3	4.71	589.33	558.67	92.07
BDQ (C)	6	0	34	22	6	0	39	26	5	3	4.71	589.32	558.67	92.07
ANT (C)	6	0	35	56	6	0	42	22	6	26	12.31	774.31	352.95	92.11
ASC (C)	6	0	49	1	6	0	56	46	7	44	29.70	778.55	215.02	92.23
PRE (C)	6	1	0	14	6	1	8	47	8	33	48.30	868.21	182.91	92.37
TAN (C)	6	1	5	40	6	1	11	34	5	54	4.82	944.86	763.77	92.39
CRO (C)	6	1	20	5	6	1	28	24	8	19	20.66	938.91	377.53	92.59
HAW (C)	6	1	46	18	6	1	52	52	6	34	11.85	674.09	392.54	92.83
CAL (C)	6	1	55	20	6	2	1	58	6	38	17.83	675.29	269.62	92.93
WHS (C)	6	1	58	27	6	2	5	9	6	42	22.64	570.20	217.55	92.97
MLA (C)	6	2	4	41	6	2	10	15	5	34	7.05	766.03	480.12	93.04
PAT (C)	6	2	4	41	6	2	10	20	5	38	7.40	753.89	469.13	93.04
GBI (C)	6	2	5	13	6	2	11	7	5	53	9.11	651.89	421.20	93.04
ANT (C)	6	2	9	46	6	2	15	54	6	7	9.14	758.08	434.42	93.07
ASC (C)	6	2	23	53	6	2	29	40	5	46	5.22	887.25	667.21	93.20
PRE (C)	6	2	34	23	6	2	42	45	8	21	19.33	900.35	388.34	93.37
TAN (C)	6	2	40	17	6	2	46	19	6	2	4.70	996.75	792.14	93.42
HAW (C)	6	3	21	27	6	3	26	12	4	44	4.26	775.76	594.94	93.83
CAL (C)	6	3	29	23	6	3	34	58	5	35	7.65	683.13	454.78	93.92
WHS (C)	6	3	33	6	6	3	37	20	4	13	2.97	662.80	632.60	93.95
PRE (C)	6	4	8	27	6	4	17	6	8	38	20.61	832.02	381.64	94.37
TAN (C)	6	4	13	44	6	4	21	45	8	0	14.10	982.71	494.21	94.41
HAW (C)	6	4	55	34	6	5	0	47	5	12	5.86	723.87	514.99	94.83
PRE (C)	6	5	42	16	6	5	51	18	9	1	39.50	762.96	232.89	95.36
TAN (C)	6	5	47	15	6	5	56	3	8	47	57.09	997.22	174.85	95.41
HAW (C)	6	6	28	48	6	6	35	37	6	48	29.60	542.84	173.91	95.82
PRE (C)	6	7	16	40	6	7	24	4	7	23	10.47	997.34	573.48	96.34
TAN (C)	6	7	22	39	6	7	27	59	5	20	3.78	839.26	789.89	96.36
HAW (C)	6	8	2	58	6	8	8	44	5	46	8.27	690.72	446.52	96.81

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ASC (C)	6	8	45	22	6	8	48	14	2	51	.87	1006.95	980.55	97.23
ASC (C)	6	10	16	42	6	10	25	4	8	21	17.38	788.96	416.50	98.24
ASC (C)	6	11	50	47	6	11	58	25	7	38	13.14	883.15	475.83	99.22
CYI (C)	6	13	30	44	6	13	35	18	4	34	2.78	765.65	748.91	100.23
ANT (C)	6	14	54	31	6	14	56	27	1	55	.56	921.24	921.24	101.10
CYI (C)	6	15	2	43	6	15	10	5	7	22	26.46	837.85	232.60	101.25
WOM (C)	6	15	45	4	6	15	50	12	5	7	4.04	931.53	724.68	101.67
ANT (C)	6	16	25	0	6	16	32	54	7	53	20.40	746.48	309.31	102.11
CYI (C)	6	16	36	38	6	16	43	46	7	8	26.63	575.61	213.19	102.23
CRO (C)	6	17	12	0	6	17	19	9	7	9	12.71	884.53	442.58	102.60
WOM (C)	6	17	16	53	6	17	25	9	8	15	21.71	777.13	323.18	102.67
MLA (C)	6	17	57	23	6	18	2	35	5	12	4.61	828.08	670.54	103.06
PAT (C)	6	17	57	19	6	18	2	38	5	19	4.89	816.71	658.50	103.06
GBI (C)	6	17	57	0	6	18	3	26	6	26	8.79	748.98	521.50	103.06
BDA (C)	6	18	0	34	6	18	6	47	6	12	8.39	729.45	506.15	103.10
BDQ (C)	6	18	0	34	6	18	6	47	6	12	8.39	729.44	506.14	103.10
ANT (C)	6	17	59	24	6	18	6	3	6	39	9.81	855.34	479.46	103.10
CYI (C)	6	18	10	48	6	18	17	33	6	44	18.56	585.22	265.84	103.23
CRO (C)	6	18	44	59	6	18	53	23	8	23	25.44	721.67	291.92	103.60
WOM (C)	6	18	50	23	6	18	59	8	8	45	43.01	800.31	203.75	103.67
MLA (C)	6	19	29	45	6	19	37	11	7	26	29.21	844.63	210.20	104.06
PAT (C)	6	19	29	44	6	19	37	12	7	27	30.55	841.78	202.69	104.06
GBI (C)	6	19	30	5	6	19	37	34	7	29	71.15	517.63	113.20	104.06
ANT (C)	6	19	36	1	6	19	38	3	2	2	.04	847.60	833.06	104.08
BDA (C)	6	19	33	33	6	19	40	45	7	11	21.63	776.26	251.40	104.11
BDQ (C)	6	19	33	33	6	19	40	45	7	11	21.63	776.25	251.39	104.11
CYI (C)	6	19	44	35	6	19	51	31	6	56	69.62	494.87	95.25	104.23
TAN (C)	6	20	5	50	6	20	9	54	4	3	2.66	824.98	724.76	104.40
CRO (C)	6	20	19	12	6	20	27	14	8	2	14.07	823.92	472.49	104.60
WOM (C)	6	20	24	11	6	20	33	4	8	53	50.05	821.36	191.01	104.67
CAL (C)	6	20	58	48	6	21	0	7	1	18	.39	863.15	863.15	104.93
WHS (C)	6	20	58	37	6	21	5	7	6	30	11.08	835.86	431.79	104.97
MLA (C)	6	21	3	43	6	21	10	43	6	59	30.26	858.01	190.37	105.04
PAT (C)	6	21	3	44	6	21	10	43	6	58	28.31	843.04	200.96	105.04
GBI (C)	6	21	4	20	6	21	11	2	6	41	16.68	845.01	303.41	105.07
BDA (C)	6	21	7	23	6	21	14	22	6	59	56.34	832.39	113.79	105.09
BDQ (C)	6	21	7	23	6	21	14	22	6	59	56.34	832.40	113.79	105.09
CYI (C)	6	21	18	58	6	21	24	16	5	17	4.85	679.24	611.23	105.20
PRE (C)	6	21	35	16	6	21	42	12	6	55	6.43	982.83	813.52	105.37
TAN (C)	6	21	36	51	6	21	47	3	10	12	40.82	1203.45	284.75	105.43
CRO (C)	6	21	53	0	6	22	4	11	11	11	33.66	1022.57	403.97	105.61
WOM (C)	6	21	58	1	6	22	8	46	10	44	25.46	1151.28	484.60	105.65
HAW (C)	6	22	20	53	6	22	28	33	7	40	13.17	709.53	496.01	105.83
CAL (C)	6	22	30	51	6	22	37	45	6	53	14.33	667.12	361.77	105.95
WHS (C)	6	22	33	32	6	22	40	45	7	13	35.19	606.41	171.50	105.97
MLA (C)	6	22	39	28	6	22	46	29	7	1	33.62	541.99	165.81	106.05
PAT (C)	6	22	39	30	6	22	46	30	7	0	31.21	549.78	176.16	106.05
GBI (C)	6	22	40	12	6	22	46	55	6	42	16.05	804.68	299.29	106.07
BDA (C)	6	22	43	0	6	22	49	33	6	32	13.50	699.50	343.32	106.09

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
BDQ (C)	6	22	43	0	6	22	49	33	6	32	13.50	699.50	343.31	106.09
ANT (C)	6	22	45	29	6	22	50	49	5	20	5.29	612.53	571.31	106.09
ASC (C)	6	22	58	32	6	23	6	9	7	36	11.13	900.15	557.36	106.24
PRE (C)	6	23	8	57	6	23	19	19	10	21	32.98	1168.59	349.43	106.38
TAN (C)	6	23	13	8	6	23	22	48	9	40	14.21	931.84	652.90	106.41
CRO (C)	6	23	28	53	6	23	40	11	11	18	72.96	967.61	242.33	106.60
WOM (C)	6	23	35	16	6	23	42	7	6	50	5.12	1087.66	981.24	106.62
HAW (C)	6	23	56	12	7	0	4	17	8	4	38.67	872.43	190.85	106.83
CAL (C)	7	0	6	9	7	0	13	4	6	55	17.13	767.41	297.71	106.95
WHS (C)	7	0	9	13	7	0	16	17	7	3	46.05	508.00	129.08	106.98
MLA (C)	7	0	15	6	7	0	22	4	6	58	23.24	600.91	231.25	107.04
PAT (C)	7	0	15	7	7	0	22	7	6	59	24.68	590.72	220.30	107.04
GBI (C)	7	0	15	39	7	0	22	44	7	4	31.00	574.91	182.88	107.04
BDA (C)	7	0	20	6	7	0	22	56	2	49	1.18	848.84	772.59	107.06
BDQ (C)	7	0	20	6	7	0	22	56	2	49	1.18	848.83	772.59	107.06
ANT (C)	7	0	20	7	7	0	27	43	7	36	24.76	745.46	237.99	107.10
ASC (C)	7	0	33	15	7	0	42	34	9	19	25.50	811.26	353.84	107.23
PRE (C)	7	0	44	28	7	0	55	22	10	54	34.38	1194.00	367.67	107.38
TAN (C)	7	0	49	55	7	0	59	1	9	6	10.26	1272.86	817.98	107.43
CRO (C)	7	1	5	21	7	1	14	38	9	17	12.74	1027.84	694.26	107.56
HAW (C)	7	1	33	5	7	1	39	10	6	5	7.57	776.94	514.27	107.83
CAL (C)	7	1	41	45	7	1	48	17	6	32	14.82	608.97	315.56	107.93
WHS (C)	7	1	45	2	7	1	51	14	6	11	9.74	760.57	422.01	107.97
MLA (C)	7	1	52	4	7	1	55	35	3	31	1.53	794.97	767.14	108.01
PAT (C)	7	1	52	2	7	1	55	41	3	39	1.64	783.85	761.34	108.01
GBI (C)	7	1	52	25	7	1	56	37	4	11	2.82	797.62	723.74	108.01
ANT (C)	7	1	56	51	7	2	1	46	4	54	3.55	851.75	746.11	108.07
ASC (C)	7	2	10	42	7	2	17	10	6	27	4.12	1178.34	949.98	108.22
PRE (C)	7	2	20	31	7	2	31	32	11	0	26.96	1201.87	469.36	108.38
TAN (C)	7	2	26	1	7	2	36	3	10	1	14.96	1155.79	687.61	108.42
HAW (C)	7	3	9	48	7	3	14	46	4	57	4.56	677.01	584.46	108.81
CAL (C)	7	3	18	13	7	3	22	6	3	53	2.46	734.70	693.02	108.90
PRE (C)	7	3	56	24	7	4	7	47	11	23	43.44	1211.01	333.14	109.37
TAN (C)	7	4	1	36	7	4	12	43	11	6	41.63	1056.63	334.87	109.41
HAW (C)	7	4	45	9	7	4	51	32	6	22	11.61	698.76	374.78	109.84
PRE (C)	7	5	32	19	7	5	43	16	10	56	31.13	1203.97	407.73	110.36
TAN (C)	7	5	37	45	7	5	47	56	10	10	22.96	1074.45	481.96	110.39
HAW (C)	7	6	20	25	7	6	27	35	7	10	18.22	738.01	296.35	110.83
ASC (C)	7	7	3	8	7	7	7	22	4	14	1.57	1241.53	1204.66	111.24
PRE (C)	7	7	9	37	7	7	16	43	7	6	5.62	1103.68	948.54	111.31
HAW (C)	7	7	57	58	7	8	0	52	2	53	1.25	918.61	821.16	111.79
ASC (C)	7	8	36	54	7	8	46	29	9	35	13.24	950.29	693.50	112.24
ASC (C)	7	10	12	13	7	10	22	41	10	28	39.92	1137.07	310.65	113.23
ASC (C)	7	11	50	5	7	11	56	2	5	57	4.26	1072.43	908.89	114.19
CYI (C)	7	11	56	43	7	11	59	10	2	26	.46	1061.96	1012.40	114.23
CYI (C)	7	13	29	16	7	13	37	3	7	46	15.84	881.58	421.38	115.25
WOM (C)	7	14	12	35	7	14	17	22	4	46	2.62	1092.66	971.43	115.67
ANT (C)	7	14	53	4	7	15	1	37	8	32	15.17	876.40	515.61	116.11
CYI (C)	7	15	4	50	7	15	12	34	7	44	61.28	502.51	131.87	116.23

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
CRO (C)	7	15	40	45	7	15	48	26	7	41	9.38	1024.65	683.13	116.60
WOM (C)	7	15	45	17	7	15	55	2	9	45	20.55	1209.96	494.02	116.69
MLA (C)	7	16	28	10	7	16	32	21	4	11	2.18	999.68	914.11	117.04
PAT (C)	7	16	28	3	7	16	32	28	4	24	2.41	986.46	902.52	117.04
GBI (C)	7	16	27	24	7	16	33	35	6	11	5.57	888.51	755.41	117.06
BDA (C)	7	16	31	3	7	16	37	0	5	57	5.19	913.62	709.08	117.11
BDQ (C)	7	16	31	3	7	16	37	0	5	57	5.19	913.62	709.08	117.11
ANT (C)	7	16	28	39	7	16	37	4	8	24	30.10	1039.17	271.14	117.11
CYI (C)	7	16	40	57	7	16	47	58	7	1	20.57	598.37	262.31	117.23
CRO (C)	7	17	14	54	7	17	25	8	10	13	41.61	1186.85	279.47	117.62
WOM (C)	7	17	20	14	7	17	31	10	10	55	53.87	1225.01	263.74	117.69
MLA (C)	7	18	1	29	7	18	9	27	7	58	16.96	797.35	400.21	118.06
PAT (C)	7	18	1	27	7	18	9	28	8	0	17.61	794.13	389.77	118.06
CBI (C)	7	18	1	38	7	18	9	57	8	19	26.02	784.17	273.97	118.06
ANT (C)	7	18	6	16	7	18	11	24	5	8	4.21	872.01	699.78	118.09
BDA (C)	7	18	5	25	7	18	12	58	7	32	20.41	841.99	311.61	118.11
BDQ (C)	7	18	5	25	7	18	12	58	7	32	20.41	841.98	311.60	118.11
CYI (C)	7	18	16	46	7	18	23	40	6	54	24.90	816.10	210.42	118.24
TAN (C)	7	18	40	18	7	18	41	2	0	43	.23	1003.68	1003.68	118.41
CRO (C)	7	18	50	35	7	19	1	7	10	32	27.72	1233.31	420.69	118.62
WOM (C)	7	18	55	47	7	19	7	7	11	19	60.83	1246.27	262.27	118.69
WHS (C)	7	19	32	29	7	19	39	6	6	37	7.03	964.41	624.03	118.99
MLA (C)	7	19	37	6	7	19	44	47	7	40	44.89	573.47	161.18	119.04
PAT (C)	7	19	37	6	7	19	44	47	7	40	42.51	576.07	167.87	119.04
GBI (C)	7	19	37	37	7	19	45	7	7	30	20.27	794.67	301.21	119.07
BDA (C)	7	19	41	1	7	19	48	24	7	23	63.32	491.28	115.44	119.09
BDQ (C)	7	19	41	1	7	19	48	24	7	23	63.32	491.28	115.43	119.09
CYI (C)	7	19	52	21	7	19	58	53	6	32	13.41	825.08	339.74	119.23
TAN (C)	7	20	11	5	7	20	20	19	9	13	28.46	859.16	322.05	119.42
CRO (C)	7	20	26	37	7	20	37	22	10	45	23.05	1207.71	518.51	119.62
WOM (C)	7	20	31	30	7	20	42	48	11	18	51.35	1013.88	296.94	119.66
HAW (C)	7	20	55	53	7	21	1	24	5	31	3.81	1013.85	891.22	119.84
CAL (C)	7	21	4	57	7	21	11	36	6	39	8.71	770.05	550.03	119.95
WHS (C)	7	21	7	14	7	21	14	47	7	33	26.81	618.79	244.59	119.97
MLA (C)	7	21	13	9	7	21	20	17	7	7	25.97	522.89	216.73	120.05
PAT (C)	7	21	13	11	7	21	20	17	7	5	24.48	529.25	227.39	120.05
GBI (C)	7	21	13	51	7	21	20	36	6	45	14.52	679.09	339.01	120.05
BDA (C)	7	21	16	47	7	21	23	41	6	54	24.44	827.97	215.09	120.10
BDQ (C)	7	21	16	47	7	21	23	41	6	54	24.45	827.98	215.08	120.10
ANT (C)	7	21	20	27	7	21	22	56	2	29	.66	794.74	771.44	120.10
PRE (C)	7	21	43	35	7	21	52	15	8	39	13.54	919.10	557.67	120.37
TAN (C)	7	21	46	29	7	21	56	17	9	47	26.12	1032.63	395.62	120.41
CRO (C)	7	22	2	23	7	22	13	44	11	21	40.24	1198.91	351.50	120.61
WOM (C)	7	22	7	38	7	22	17	32	9	53	15.59	1129.65	657.55	120.65
HAW (C)	7	22	29	34	7	22	38	20	8	45	29.54	833.65	277.28	120.83
CAL (C)	7	22	39	49	7	22	47	6	7	17	17.37	789.09	329.86	120.96
WHS (C)	7	22	42	56	7	22	50	14	7	17	58.92	525.94	117.19	120.98
MLA (C)	7	22	48	55	7	22	55	56	7	0	40.95	587.54	140.34	121.05
PAT (C)	7	22	48	56	7	22	55	57	7	1	41.91	581.71	137.85	121.05

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
GBI (C)	7	22	49	29	7	22	56	31	7	1	40.58	540.92	141.32	121.05
BDA (C)	7	22	52	41	7	22	58	15	5	34	6.72	782.40	499.73	121.07
BDQ (C)	7	22	52	41	7	22	58	15	5	34	6.72	782.40	499.73	121.07
ANT (C)	7	22	54	23	7	23	0	49	6	26	11.85	724.05	370.97	121.09
ASC (C)	7	23	7	18	7	23	15	55	8	36	33.73	855.49	240.40	121.24
PRE (C)	7	23	18	11	7	23	28	36	10	24	71.24	987.97	208.34	121.37
TAN (C)	7	23	23	6	7	23	32	3	8	57	10.88	1074.08	744.03	121.41
CRO (C)	7	23	38	13	7	23	49	12	10	58	29.35	1182.98	429.33	121.60
HAW (C)	8	0	5	43	8	0	13	26	7	43	15.06	782.73	406.42	121.84
CAL (C)	8	0	15	21	8	0	22	22	7	0	24.28	556.99	224.50	121.94
WHS (C)	8	0	18	38	8	0	25	24	6	45	17.51	791.65	276.65	121.98
MLA (C)	8	0	24	46	8	0	30	44	5	57	8.00	797.13	462.94	122.02
PAT (C)	8	0	24	47	8	0	30	48	6	0	8.15	799.61	458.60	122.02
GBI (C)	8	0	25	16	8	0	31	37	6	20	11.18	698.49	390.70	122.04
ANT (C)	8	0	29	39	8	0	36	35	6	55	15.63	606.36	336.02	122.08
ASC (C)	8	0	43	13	8	0	51	17	8	4	11.83	1071.45	586.09	122.23
PRE (C)	8	0	53	56	8	1	4	36	10	40	31.92	1020.36	386.46	122.37
TAN (C)	8	0	59	31	8	1	8	39	9	8	10.18	1049.67	815.88	122.41
CRO (C)	8	1	15	37	8	1	22	30	6	53	5.16	1117.06	979.01	122.55
HAW (C)	8	1	42	48	8	1	48	23	5	35	5.30	896.96	612.66	122.82
CAL (C)	8	1	51	13	8	1	57	0	5	47	7.63	778.00	468.65	122.93
WHS (C)	8	1	54	47	8	1	59	38	4	50	4.58	796.53	576.47	122.96
ASC (C)	8	2	22	35	8	2	24	0	1	25	.28	1150.04	1150.04	123.18
PRE (C)	8	2	29	49	8	2	40	50	11	0	33.08	1056.89	397.55	123.37
TAN (C)	8	2	35	10	8	2	45	46	10	36	21.33	1106.48	549.18	123.43
HAW (C)	8	3	19	1	8	3	24	26	5	25	5.31	567.49	561.16	123.82
PRE (C)	8	4	5	31	8	4	16	54	11	22	66.14	1260.68	255.94	124.38
TAN (C)	8	4	10	46	8	4	21	58	11	11	67.56	1283.62	245.36	124.41
HAW (C)	8	4	54	7	8	5	0	54	6	46	20.22	807.61	246.02	124.84
PRE (C)	8	5	41	39	8	5	51	51	10	11	18.86	1078.88	580.07	125.34
TAN (C)	8	5	47	30	8	5	56	5	8	34	9.19	1057.23	792.84	125.38
HAW (C)	8	6	29	52	8	6	36	4	6	12	9.87	642.56	428.42	125.81
ASC (C)	8	7	10	58	8	7	18	21	7	22	5.60	1093.74	995.58	126.24
ASC (C)	8	8	45	23	8	8	56	6	10	43	31.51	999.40	395.64	127.24
ASC (C)	8	10	21	24	8	10	31	14	9	49	21.24	1067.72	483.68	128.23
CYI (C)	8	12	3	16	8	12	10	1	6	44	6.87	876.85	727.06	129.24
ANT (C)	8	13	27	25	8	13	33	49	6	23	4.91	1018.76	903.25	130.11
CYI (C)	8	13	37	39	8	13	46	10	8	31	29.93	812.52	256.82	130.24
WOM (C)	8	14	19	51	8	14	27	12	7	21	7.89	1099.15	716.92	130.68
BDA (C)	8	15	6	35	8	15	7	59	1	24	.31	1060.69	1060.69	131.08
BDQ (C)	8	15	6	35	8	15	7	59	1	24	.31	1060.68	1060.68	131.08
ANT (C)	8	15	1	17	8	15	10	41	9	23	39.57	834.70	251.82	131.10
CYI (C)	8	15	13	34	8	15	21	20	7	46	22.15	763.86	292.99	131.24
CRO (C)	8	15	48	48	8	15	57	37	8	49	21.07	1009.97	408.09	131.61
WOM (C)	8	15	53	43	8	16	3	52	10	8	38.87	1032.57	299.69	131.68
MLA (C)	8	16	35	8	8	16	42	24	7	15	8.93	830.58	649.80	132.05
PAT (C)	8	16	35	5	8	16	42	26	7	20	9.31	819.63	637.72	132.05
GBI (C)	8	16	34	59	8	16	43	3	8	4	14.15	950.50	509.37	132.08
BDA (C)	8	16	38	48	8	16	46	18	7	30	12.64	1050.11	492.13	132.10

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
BDQ (C)	8	16	38	48	8	16	46	18	7	30	12.64	1050.11	492.12	132.10
ANT (C)	8	16	37	43	8	16	45	36	7	52	11.84	866.03	510.80	132.10
CYI (C)	8	16	49	39	8	16	56	43	7	4	20.13	649.35	272.67	132.22
CRO (C)	8	17	23	35	8	17	33	47	10	12	47.30	1041.51	257.76	132.61
WOM (C)	8	17	28	59	8	17	39	50	10	50	52.65	1078.45	268.40	132.68
WHS (C)	8	18	5	27	8	18	11	26	5	58	2.46	1050.53	917.10	132.97
MLA (C)	8	18	9	54	8	18	18	18	8	23	26.39	1030.22	277.15	133.06
PAT (C)	8	18	9	54	8	18	18	19	8	24	26.95	1047.22	272.63	133.06
GBI (C)	8	18	10	16	8	18	18	41	8	24	43.58	1030.08	187.48	133.06
ANT (C)	8	18	16	9	8	18	19	34	3	24	1.60	859.27	837.45	133.09
BDA (C)	8	18	13	50	8	18	21	44	7	53	26.10	771.39	262.75	133.11
BDQ (C)	8	18	13	50	8	18	21	44	7	53	26.10	771.39	262.74	133.11
CYI (C)	8	18	25	24	8	18	32	20	6	55	45.98	567.78	124.35	133.23
TAN (C)	8	18	45	50	8	18	51	45	5	55	5.57	928.93	690.50	133.42
CRO (C)	8	18	59	30	8	19	9	29	9	59	20.99	1206.61	495.56	133.62
WOM (C)	8	19	4	27	8	19	15	26	10	58	58.36	1237.45	254.63	133.68
CAL (C)	8	19	38	43	8	19	44	1	5	18	3.87	993.39	823.97	133.95
WHS (C)	8	19	40	6	8	19	47	56	7	49	13.28	826.36	465.50	133.99
MLA (C)	8	19	45	35	8	19	53	12	7	37	30.27	604.54	221.72	134.04
PAT (C)	8	19	45	36	8	19	53	12	7	36	28.65	609.84	231.74	134.04
GBI (C)	8	19	46	13	8	19	53	34	7	20	15.37	788.80	372.44	134.07
BDA (C)	8	19	49	25	8	19	56	48	7	22	63.22	492.14	115.39	134.09
BDQ (C)	8	19	49	25	8	19	56	48	7	22	63.22	492.15	115.39	134.09
CYI (C)	8	20	1	22	8	20	6	28	5	6	5.28	603.96	531.23	134.20
PRE (C)	8	20	19	2	8	20	22	29	3	26	1.58	935.42	905.70	134.35
TAN (C)	8	20	19	26	8	20	28	30	9	4	58.70	856.17	175.95	134.41
CRO (C)	8	20	35	7	8	20	45	40	10	33	24.59	1194.30	469.29	134.62
WOM (C)	8	20	39	53	8	20	50	42	10	48	32.26	984.20	396.50	134.66
HAW (C)	8	21	2	32	8	21	10	44	8	11	11.75	1035.57	601.92	134.84
CAL (C)	8	21	12	27	8	21	20	2	7	35	13.51	864.16	432.56	134.95
WHS (C)	8	21	15	18	8	21	23	3	7	44	48.49	531.16	155.09	134.98
MLA (C)	8	21	21	24	8	21	28	32	7	8	30.63	543.40	186.92	135.05
PAT (C)	8	21	21	26	8	21	28	33	7	7	28.96	542.07	195.66	135.05
GBI (C)	8	21	22	4	8	21	28	57	6	53	18.14	634.96	284.37	135.05
BDA (C)	8	21	25	0	8	21	31	31	6	30	12.97	786.04	337.92	135.10
BDQ (C)	8	21	25	0	8	21	31	31	6	30	12.97	786.04	337.92	135.10
ANT (C)	8	21	27	53	8	21	32	13	4	20	3.10	656.78	631.79	135.10
ASC (C)	8	21	41	34	8	21	46	48	5	13	4.32	691.23	640.50	135.23
PRE (C)	8	21	51	22	8	22	0	22	8	59	29.07	916.19	307.52	135.37
TAN (C)	8	21	55	14	8	22	3	55	8	40	14.46	1067.60	556.11	135.42
CRO (C)	8	22	10	25	8	22	21	36	11	11	51.54	1194.35	284.87	135.61
WOM (C)	8	22	16	18	8	22	24	18	8	0	6.98	1131.87	911.36	135.63
HAW (C)	8	22	37	23	8	22	46	21	8	57	34.64	740.11	260.03	135.84
CAL (C)	8	22	47	35	8	22	55	2	7	26	27.64	586.02	228.51	135.94
WHS (C)	8	22	50	49	8	22	58	5	7	15	28.73	803.60	197.39	135.99
MLA (C)	8	22	56	54	8	23	3	36	6	42	17.01	750.32	272.99	136.05
PAT (C)	8	22	56	56	8	23	3	39	6	43	17.92	755.69	262.27	136.05
GBI (C)	8	22	57	29	8	23	4	23	6	53	41.84	557.36	132.16	136.05
BDA (C)	8	23	1	41	8	23	4	34	2	53	1.82	683.88	683.88	136.05

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
BDQ (C)	8	23	1	41	8	23	4	34	2	53	1.82	683.88	683.88	136.05
ANT (C)	8	23	2	5	8	23	8	58	6	53	43.03	551.56	129.00	136.09
ASC (C)	8	23	15	22	8	23	23	26	8	3	38.58	987.85	201.48	136.24
PRE (C)	8	23	26	13	8	23	36	11	9	57	42.19	1022.37	269.66	136.37
TAN (C)	8	23	31	36	8	23	39	42	8	6	8.56	1167.84	791.97	136.42
CRO (C)	8	23	46	16	8	23	56	18	10	1	17.90	1096.99	591.73	136.58
HAW (C)	9	0	13	47	9	0	20	58	7	11	11.75	734.65	479.31	136.82
CAL (C)	9	0	23	7	9	0	29	47	6	39	14.57	840.18	323.96	136.94
WHS (C)	9	0	26	22	9	0	32	44	6	21	13.03	656.41	337.65	136.96
MLA (C)	9	0	33	23	9	0	37	2	3	39	2.55	648.92	648.92	137.01
PAT (C)	9	0	33	22	9	0	37	11	3	49	2.73	640.17	640.17	137.01
GBI (C)	9	0	33	55	9	0	37	59	4	3	2.85	696.13	634.56	137.02
ANT (C)	9	0	38	26	9	0	42	52	4	25	3.35	695.85	650.40	137.06
ASC (C)	9	0	52	18	9	0	57	40	5	21	3.73	1027.45	848.11	137.22
PRE (C)	9	1	1	48	9	1	12	3	10	14	26.40	1100.41	424.64	137.38
TAN (C)	9	1	7	17	9	1	16	31	9	13	11.92	1057.95	725.76	137.42
HAW (C)	9	1	50	30	9	1	56	0	5	30	5.73	782.30	586.57	137.83
CAL (C)	9	1	59	9	9	2	3	30	4	20	3.64	788.76	601.46	137.92
PRE (C)	9	2	37	18	9	2	48	9	10	50	37.72	1093.10	346.86	138.38
TAN (C)	9	2	42	20	9	2	53	11	10	51	32.64	1077.38	392.21	138.41
HAW (C)	9	3	26	0	9	3	32	6	6	5	9.99	638.47	403.65	138.83
PRE (C)	9	4	12	39	9	4	23	39	11	0	36.84	1178.54	358.28	139.36
TAN (C)	9	4	17	50	9	4	28	34	10	43	32.72	990.11	385.71	139.40
HAW (C)	9	5	1	9	9	5	7	50	6	40	22.37	774.24	215.99	139.83
ASC (C)	9	5	45	15	9	5	45	15	0	0	.00	1261.05	1261.05	140.22
PRE (C)	9	5	49	3	9	5	57	28	8	24	8.96	1237.01	831.76	140.33
TAN (C)	9	5	55	48	9	6	0	54	5	6	2.37	1113.25	1084.66	140.35
HAW (C)	9	6	38	6	9	6	40	54	2	48	1.66	700.93	700.93	140.78
ASC (C)	9	7	16	47	9	7	25	53	9	5	11.15	1189.85	765.25	141.25
ASC (C)	9	8	51	27	9	9	2	23	10	56	75.61	970.09	223.96	142.24
ASC (C)	9	10	28	7	9	10	36	16	8	9	8.19	1057.22	796.40	143.21
CYI (C)	9	10	37	6	9	10	37	23	0	17	.10	1134.28	1134.28	143.23
CYI (C)	9	12	7	55	9	12	16	19	8	23	13.24	883.08	531.29	144.24
ANT (C)	9	13	31	31	9	13	40	17	8	46	12.38	930.42	648.81	145.11
CYI (C)	9	13	42	57	9	13	51	32	8	35	63.99	1008.80	157.41	145.25
CRO (C)	9	14	20	43	9	14	25	30	4	46	3.32	962.73	780.71	145.60
WOM (C)	9	14	24	34	9	14	32	39	8	4	12.54	862.70	551.17	145.67
MLA (C)	9	15	6	45	9	15	10	22	3	36	1.42	1106.38	1044.12	146.05
PAT (C)	9	15	6	38	9	15	10	29	3	51	1.63	1094.04	1032.69	146.05
GBI (C)	9	15	5	45	9	15	11	53	6	8	4.60	1008.30	883.58	146.07
BDA (C)	9	15	9	14	9	15	15	30	6	15	4.86	1124.55	815.28	146.11
BDQ (C)	9	15	9	14	9	15	15	30	6	15	4.86	1124.54	815.28	146.11
ANT (C)	9	15	6	18	9	15	15	52	9	33	55.42	974.51	205.45	146.11
CYI (C)	9	15	18	51	9	15	26	34	7	43	24.60	899.60	263.66	146.23
CRO (C)	9	15	53	37	9	16	2	34	8	57	36.17	836.48	243.61	146.60
WOM (C)	9	15	58	51	9	16	8	38	9	47	61.33	973.95	201.19	146.67
MLA (C)	9	16	39	15	9	16	47	45	8	29	17.62	912.47	453.46	147.07
PAT (C)	9	16	39	13	9	16	47	45	8	32	18.30	1124.86	441.81	147.07
GBI (C)	9	16	39	19	9	16	48	17	8	57	24.82	793.33	354.68	147.07

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ANT (C)	9	16	43	15	9	16	50	10	6	55	7.89	1073.07	641.07	147.09
BDA (C)	9	16	43	9	9	16	51	20	8	10	21.87	1056.06	349.60	147.12
BDQ (C)	9	16	43	9	9	16	51	20	8	10	21.87	1056.06	349.59	147.12
CYI (C)	9	16	54	34	9	17	1	44	7	10	18.15	756.06	284.52	147.24
CRO (C)	9	17	28	45	9	17	38	15	9	30	31.26	984.93	320.82	147.61
WOM (C)	9	17	33	51	9	17	44	21	10	29	62.31	1017.74	225.88	147.68
WHS (C)	9	18	10	0	9	18	17	1	7	0	7.52	919.44	714.48	147.98
MLA (C)	9	18	14	18	9	18	22	56	8	37	58.91	868.19	159.21	148.05
PAT (C)	9	18	14	19	9	18	22	56	8	37	57.63	868.92	161.31	148.05
GBI (C)	9	18	14	51	9	18	23	11	8	20	39.07	974.06	211.81	148.05
ANT (C)	9	18	21	49	9	18	23	45	1	55	.68	875.73	875.73	148.08
BDA (C)	9	18	18	20	9	18	26	27	8	6	35.90	810.48	198.88	148.10
BDQ (C)	9	18	18	20	9	18	26	27	8	6	35.90	810.48	198.87	148.10
CYI (C)	9	18	30	0	9	18	36	47	6	47	23.85	573.11	212.28	148.22
TAN (C)	9	18	49	33	9	18	56	57	7	24	15.15	667.59	401.96	148.41
CRO (C)	9	19	4	18	9	19	14	9	9	51	22.26	1067.54	463.34	148.61
WOM (C)	9	19	9	8	9	19	19	55	10	46	41.62	1169.76	316.19	148.68
HAW (C)	9	19	33	38	9	19	38	18	4	39	2.16	1061.46	1061.34	148.83
CAL (C)	9	19	42	5	9	19	49	15	7	10	8.51	984.11	656.72	148.96
WHS (C)	9	19	44	15	9	19	52	39	8	24	24.53	862.13	306.06	148.99
MLA (C)	9	19	50	9	9	19	57	54	7	44	18.73	750.35	318.10	149.06
PAT (C)	9	19	50	11	9	19	57	54	7	42	18.08	756.49	323.30	149.06
GBI (C)	9	19	50	56	9	19	58	17	7	21	16.90	899.24	339.66	149.06
BDA (C)	9	19	53	52	9	20	1	12	7	20	32.47	619.90	191.85	149.09
BDQ (C)	9	19	53	52	9	20	1	12	7	20	32.47	619.90	191.85	149.09
ANT (C)	9	19	58	15	9	19	59	45	1	29	.66	797.53	797.53	149.09
CYI (C)	9	20	7	14	9	20	9	17	2	2	.08	780.96	776.52	149.19
PRE (C)	9	20	22	2	9	20	28	20	6	18	6.91	842.60	639.71	149.36
TAN (C)	9	20	24	6	9	20	32	49	8	42	21.41	772.47	352.50	149.41
CRO (C)	9	20	39	38	9	20	50	20	10	42	36.34	1048.59	348.83	149.61
WOM (C)	9	20	44	35	9	20	54	40	10	5	19.19	1118.40	560.88	149.65
HAW (C)	9	21	6	19	9	21	15	37	9	18	26.50	992.01	360.99	149.85
CAL (C)	9	21	16	35	9	21	24	38	8	3	22.15	902.10	314.97	149.95
WHS (C)	9	21	19	37	9	21	27	31	7	54	37.37	808.94	195.33	150.00
MLA (C)	9	21	25	48	9	21	33	4	7	15	39.92	579.14	154.86	150.04
PAT (C)	9	21	25	49	9	21	33	4	7	15	37.14	586.36	163.90	150.04
GBI (C)	9	21	26	32	9	21	33	35	7	3	17.41	736.70	300.00	150.07
BDA (C)	9	21	29	35	9	21	35	38	6	2	9.40	719.60	416.66	150.09
BDQ (C)	9	21	29	35	9	21	35	38	6	2	9.40	719.59	416.66	150.09
ANT (C)	9	21	31	46	9	21	37	32	5	46	8.08	731.08	441.56	150.11
ASC (C)	9	21	45	13	9	21	52	4	6	50	13.11	811.25	387.54	150.24
PRE (C)	9	21	55	39	9	22	3	34	7	54	41.57	1100.84	223.04	150.36
TAN (C)	9	22	0	16	9	22	8	7	7	51	9.25	1019.66	689.94	150.41
CRO (C)	9	22	14	57	9	22	25	54	10	56	37.94	1181.52	348.35	150.60
WOM (C)	9	22	22	9	9	22	26	48	4	38	1.95	1167.93	1145.06	150.60
HAW (C)	9	22	41	49	9	22	50	37	8	47	30.45	895.56	287.53	150.83
CAL (C)	9	22	51	57	9	22	59	20	7	23	27.10	888.15	232.07	150.93
WHS (C)	9	22	55	15	9	23	2	19	7	3	36.68	799.84	167.18	150.97
MLA (C)	9	23	1	30	9	23	7	53	6	23	13.96	815.55	318.24	151.04

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Continued

MSFN STATION NAME	ACQUISITION DAY	HR	MIN	SEC	LOSS DAY	HR	MIN	SEC	ELAPSED TIME MIN	SEC	MAX ELEVATION DEG	MAX RANGE N MI	MIN RANGE N MI	REVOLUTION NUMBER
PAT (C)	9	23	1	31	9	23	7	57	6	25	14.55	819.39	309.03	151.04
GBI (C)	9	23	2	7	9	23	8	36	6	28	14.71	798.17	306.70	151.04
ANT (C)	9	23	6	38	9	23	13	34	6	55	18.26	783.62	286.11	151.09
ASC (C)	9	23	19	54	9	23	28	8	8	13	13.71	834.74	506.32	151.22
PRE (C)	9	23	30	52	9	23	41	6	10	14	27.07	1176.93	411.95	151.38
TAN (C)	9	23	36	23	9	23	44	55	8	31	9.33	1231.01	804.20	151.43
CRO (C)	9	23	51	49	9	23	59	47	7	57	7.45	1110.34	851.12	151.56
HAW (C)	10	0	19	12	10	0	25	0	5	47	6.42	789.66	554.09	151.83
CAL (C)	10	0	27	44	10	0	33	50	6	5	10.88	625.11	375.16	151.93
WHS (C)	10	0	31	12	10	0	36	32	5	19	5.60	548.99	521.78	151.95
ASC (C)	10	0	58	12	10	1	1	22	3	9	.83	1087.92	1062.75	152.20
PRE (C)	10	1	6	26	10	1	16	57	10	31	26.41	1220.44	439.74	152.38
TAN (C)	10	1	11	46	10	1	21	43	9	57	16.91	1076.55	608.55	152.42
HAW (C)	10	1	55	22	10	2	0	25	5	3	4.56	623.89	573.57	152.82
PRE (C)	10	2	41	45	10	2	52	47	11	1	53.64	1238.12	272.91	153.38
TAN (C)	10	2	46	56	10	2	57	53	10	57	65.10	980.43	240.04	153.41
HAW (C)	10	3	30	16	10	3	36	40	6	23	13.66	706.96	318.86	153.82
PRE (C)	10	4	17	22	10	4	27	45	10	22	25.02	1023.31	461.54	154.35
TAN (C)	10	4	22	57	10	4	32	13	9	15	13.14	929.89	660.19	154.38
HAW (C)	10	5	5	23	10	5	11	56	6	33	15.52	597.27	301.46	154.81
ASC (C)	10	5	47	13	10	5	52	44	5	30	2.62	1249.74	1108.37	155.25
PRE (C)	10	5	55	12	10	5	59	43	4	31	1.94	1115.53	1112.61	155.30
ASC (C)	10	7	20	50	10	7	30	45	9	55	18.59	1189.20	549.53	156.25
ASC (C)	10	8	56	2	10	9	6	12	10	9	31.18	1099.81	363.22	157.22
ASC (C)	10	10	34	41	10	10	37	50	3	8	1.12	1146.08	1057.29	158.18
CYI (C)	10	10	38	33	10	10	43	45	5	12	3.37	1069.45	882.32	158.23
ANT (C)	10	12	3	3	10	12	6	36	3	33	1.38	1072.57	1072.57	159.09
CYI (C)	10	12	11	55	10	12	20	11	8	16	23.61	888.53	311.25	159.24
WOM (C)	10	12	54	54	10	13	0	20	5	25	3.52	901.05	846.75	159.66
ANT (C)	10	13	35	17	10	13	44	22	9	5	23.31	854.72	372.79	160.10
CYI (C)	10	13	47	16	10	13	55	6	7	49	28.54	789.62	239.61	160.25
CRO (C)	10	14	23	2	10	14	30	45	7	42	12.31	1099.26	535.36	160.62
WOM (C)	10	14	27	45	10	14	37	10	9	25	26.02	1102.59	374.74	160.68
MLA (C)	10	15	9	20	10	15	15	22	6	2	5.09	920.44	785.50	161.06
PAT (C)	10	15	9	16	10	15	15	25	6	9	5.36	912.13	773.71	161.06
GBI (C)	10	15	8	56	10	15	16	14	7	17	9.25	801.11	631.09	161.06
BDA (C)	10	15	12	40	10	15	19	33	6	52	8.39	1035.37	603.58	161.11
BDQ (C)	10	15	12	40	10	15	19	33	6	52	8.39	1035.36	603.57	161.11
ANT (C)	10	15	10	56	10	15	19	12	8	15	19.24	860.44	388.95	161.11
CYI (C)	10	15	23	6	10	15	30	11	7	4	21.71	549.17	253.52	161.23
CRO (C)	10	15	57	7	10	16	6	47	9	39	35.75	1169.81	279.42	161.62
WOM (C)	10	16	2	30	10	16	12	48	10	17	50.43	1221.42	249.16	161.69
MLA (C)	10	16	43	5	10	16	51	22	8	17	24.16	797.88	312.56	162.06
PAT (C)	10	16	43	4	10	16	51	23	8	18	25.11	795.72	303.37	162.06
GBI (C)	10	16	43	19	10	16	51	49	8	30	28.65	741.02	257.87	162.06
ANT (C)	10	16	48	29	10	16	53	2	4	32	3.03	925.41	761.57	162.09
BDA (C)	10	16	47	5	10	16	54	49	7	44	27.26	855.13	252.40	162.11
BDQ (C)	10	16	47	5	10	16	54	49	7	44	27.26	855.13	252.39	162.11
CYI (C)	10	16	58	35	10	17	5	26	6	51	25.96	795.89	196.74	162.23

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued
(c) CSM C-band sites - Concluded

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
TAN (C)	10	17	20	12	10	17	23	41	3	28	1.50	870.18	861.14	162.40
CRO (C)	10	17	32	35	10	17	42	26	9	50	24.35	1094.40	423.32	162.60
WOM (C)	10	17	37	36	10	17	48	26	10	49	79.03	956.36	216.82	162.67
CAL (C)	10	18	12	56	10	18	16	2	3	5	1.37	943.07	943.07	162.93
WHS (C)	10	18	13	27	10	18	20	44	7	16	10.92	928.86	533.36	163.00
MLA (C)	10	18	18	35	10	18	26	20	7	45	42.51	934.05	168.46	163.05
PAT (C)	10	18	18	36	10	18	26	20	7	43	39.73	937.01	177.40	163.05
GBI (C)	10	18	19	7	10	18	26	35	7	27	21.67	620.66	286.98	163.05
BDA (C)	10	18	22	26	10	18	29	51	7	24	40.23	847.40	156.37	163.10
BDQ (C)	10	18	22	26	10	18	29	51	7	24	40.23	847.41	156.37	163.10
CYI (C)	10	18	34	0	10	18	38	46	4	45	10.15	791.92	386.31	163.21
TAN (C)	10	18	52	36	10	19	1	21	8	44	48.75	972.42	193.73	163.42
CRO (C)	10	19	8	4	10	19	18	22	10	18	25.03	1066.16	449.52	163.61
WOM (C)	10	19	12	55	10	19	23	38	10	43	38.87	1058.93	337.15	163.66
HAW (C)	10	19	36	8	10	19	42	59	6	51	6.98	1144.29	757.22	163.83
CAL (C)	10	19	45	59	10	19	51	58	5	59	8.75	931.57	465.78	163.93

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(d) S-IVB C-band sites

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
HAW (C)	0	2	54	59	0	3	0	43	5	44	17.22	936.14	371.65	2.85
CAL (C)	0	3	2	43	0	3	10	20	7	37	21.50	605.62	306.74	2.94
WHS (C)	0	3	5	23	0	3	13	31	8	8	33.06	776.42	218.40	2.99
MLA (C)	0	3	11	12	0	3	19	1	7	48	36.18	819.11	208.57	3.05
PAT (C)	0	3	11	14	0	3	19	3	7	48	34.26	814.73	217.70	3.05
GBI (C)	0	3	11	53	0	3	19	53	7	59	24.09	777.83	290.80	3.05
BDA (C)	0	3	14	46	0	3	22	17	7	31	16.67	579.79	386.77	3.08
BDQ (C)	0	3	14	46	0	3	22	17	7	31	16.67	579.78	386.76	3.08
ANT (C)	0	3	16	55	0	3	24	13	7	18	12.47	633.45	471.77	3.10
ASC (C)	0	3	30	31	0	3	38	53	8	22	20.10	944.04	384.66	3.24
PRE (C)	0	3	41	42	0	3	51	3	9	21	64.98	940.00	180.58	3.37
TAN (C)	0	3	46	33	0	3	54	3	7	30	9.06	815.39	669.76	3.40
CRO (C)	0	4	1	49	0	4	10	51	9	2	46.46	972.50	212.74	3.59
HAW (C)	0	4	27	45	0	4	35	40	7	55	23.74	831.03	284.72	3.83
CAL (C)	0	4	37	3	0	4	45	3	8	0	25.28	800.46	271.70	3.95
WHS (C)	0	4	40	14	0	4	48	12	7	58	46.08	914.48	172.31	3.98
MLA (C)	0	4	46	6	0	4	54	1	7	55	22.58	905.74	312.72	4.04
PAT (C)	0	4	46	7	0	4	54	4	7	56	23.61	910.38	302.26	4.04
GBI (C)	0	4	46	40	0	4	54	46	8	6	27.43	895.53	268.79	4.06
BDA (C)	0	4	51	12	0	4	54	37	3	24	1.58	945.03	878.71	4.06
BDQ (C)	0	4	51	12	0	4	54	37	3	24	1.58	945.03	878.71	4.06
ANT (C)	0	4	51	11	0	4	59	41	8	30	25.25	733.57	301.31	4.09
ASC (C)	0	5	5	11	0	5	13	43	8	31	15.52	819.42	480.99	4.22
PRE (C)	0	5	16	43	0	5	25	54	9	10	22.21	765.61	391.91	4.36
TAN (C)	0	5	22	41	0	5	29	7	6	26	5.47	963.55	801.75	4.41
CRO (C)	0	5	37	54	0	5	43	44	5	49	4.72	979.73	783.39	4.55
HAW (C)	0	6	3	32	0	6	10	5	6	32	8.21	797.37	559.80	4.82
CAL (C)	0	6	11	49	0	6	19	27	7	37	15.36	841.80	402.39	4.94
WHS (C)	0	6	15	5	0	6	22	20	7	15	12.51	966.03	463.30	4.98
MLA (C)	0	6	22	26	0	6	26	26	3	59	2.12	972.82	857.94	5.02
PAT (C)	0	6	22	23	0	6	26	31	4	8	2.28	961.17	849.83	5.02
GBI (C)	0	6	23	1	0	6	27	17	4	15	2.28	882.49	850.15	5.02
ANT (C)	0	6	27	57	0	6	32	0	4	2	2.14	952.24	885.94	5.05
ASC (C)	0	6	43	36	0	6	45	45	2	8	.74	1026.57	1026.57	5.18
PRE (C)	0	6	52	3	0	7	0	57	8	54	22.51	1031.11	386.22	5.37
TAN (C)	0	6	57	34	0	7	5	18	7	44	9.39	948.61	640.95	5.42
HAW (C)	0	7	38	57	0	7	45	24	6	26	7.86	765.75	575.74	5.83
CAL (C)	0	7	47	25	0	7	52	28	5	2	3.73	946.79	760.83	5.92
PRE (C)	0	8	26	54	0	8	36	8	9	13	36.25	783.72	260.27	6.35
TAN (C)	0	8	32	3	0	8	41	2	8	58	45.76	1011.07	211.86	6.41

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Continued

(d) S-IVB C-band sites - Continued

MSFN STATION NAME	ACQUISITION DAY	HR	MIN	SEC	LOSS DAY	HR	MIN	SEC	ELAPSED TIME MIN	SEC	MAX ELEVATION DEG	MAX RANGE N MI	MIN RANGE N MI	REVOLUTION NUMBER
HAW (C)	0	9	13	24	0	9	21	18	7	53	16.18	773.96	387.12	6.84
PRE (C)	0	10	2	1	0	10	10	25	8	24	20.69	1002.49	384.89	7.35
TAN (C)	0	10	7	24	0	10	14	54	7	29	9.87	894.23	588.62	7.39
HAW (C)	0	10	48	6	0	10	56	8	8	2	26.73	906.51	276.91	7.82
PRE (C)	0	11	40	19	0	11	40	21	0	1	.01	1015.88	1015.88	8.29
HAW (C)	0	12	25	24	0	12	27	40	2	16	.99	926.09	926.09	8.77
ASC (C)	0	13	4	36	0	13	12	11	7	34	11.30	746.60	555.77	9.23
ASC (C)	0	14	38	52	0	14	47	26	8	34	24.15	755.51	321.80	10.22
CYI (C)	0	16	21	51	0	16	23	6	1	15	.52	920.80	920.80	11.22
CYI (C)	0	17	53	1	0	18	0	39	7	38	17.70	868.45	359.05	12.25
WOM (C)	0	18	36	16	0	18	40	58	4	41	2.74	1027.25	892.50	12.66
ANT (C)	0	19	16	25	0	19	24	0	7	34	16.09	625.47	397.99	13.10
CYI (C)	0	19	27	25	0	19	35	30	8	4	26.92	754.07	255.03	13.24
CRO (C)	0	20	3	37	0	20	11	8	7	30	8.95	919.07	633.86	13.60
WOM (C)	0	20	8	34	0	20	17	18	8	43	20.97	885.26	393.25	13.67
MLA (C)	0	20	50	20	0	20	53	53	3	32	1.81	845.10	845.10	14.04
PAT (C)	0	20	50	14	0	20	54	1	3	46	2.04	942.67	833.30	14.04
GBI (C)	0	20	49	36	0	20	55	11	5	35	5.13	848.67	688.97	14.06
BDA (C)	0	20	52	58	0	20	58	49	5	50	5.80	854.11	650.76	14.11
BDQ (C)	0	20	52	58	0	20	58	49	5	50	5.80	854.11	650.75	14.11
ANT (C)	0	20	50	52	0	20	58	40	7	48	20.58	866.26	323.39	14.11
CYI (C)	0	21	2	28	0	21	10	10	7	41	24.62	546.30	273.04	14.23
CRO (C)	0	21	37	13	0	21	46	25	9	12	51.65	1055.37	201.50	14.61
WOM (C)	0	21	42	47	0	21	52	7	9	19	37.22	738.70	259.63	14.66
MLA (C)	0	22	22	35	0	22	30	16	7	40	22.90	584.66	294.06	15.05
PAT (C)	0	22	22	34	0	22	30	16	7	42	24.08	577.87	282.73	15.05
GBI (C)	0	22	22	44	0	22	30	45	8	1	36.79	844.53	202.18	15.07
BDA (C)	0	22	26	21	0	22	34	5	7	43	27.91	556.30	248.04	15.10
BDQ (C)	0	22	26	21	0	22	34	5	7	43	27.91	556.30	248.04	15.10
ANT (C)	0	22	27	26	0	22	32	20	4	53	3.52	923.68	738.64	15.10
CYI (C)	0	22	37	6	0	22	45	12	8	6	28.08	765.46	247.97	15.24
TAN (C)	0	22	59	43	0	23	3	0	3	16	1.06	954.67	946.53	15.41
CRO (C)	0	23	12	21	0	23	21	5	8	43	21.79	1068.44	389.25	15.59
WOM (C)	0	23	17	38	0	23	26	54	9	15	73.78	1069.88	168.86	15.67
WHS (C)	0	23	52	35	0	23	59	4	6	28	8.19	789.25	563.61	15.98
MLA (C)	0	23	57	3	1	0	5	3	7	59	38.94	848.89	189.77	16.05
PAT (C)	0	23	57	4	1	0	5	2	7	58	37.31	851.42	196.16	16.05
GBI (C)	0	23	57	37	1	0	5	19	7	42	25.80	537.27	262.89	16.05
ANT (C)	1	0	4	55	1	0	5	55	1	0	.44	896.73	896.73	16.08
BDA (C)	1	0	0	42	1	0	8	46	8	4	32.41	772.64	218.90	16.10
BDQ (C)	1	0	0	42	1	0	8	46	8	4	32.41	772.64	218.89	16.10
CYI (C)	1	0	11	51	1	0	19	31	7	39	20.09	948.89	329.49	16.23
TAN (C)	1	0	31	26	1	0	40	11	8	45	35.31	1001.88	252.06	16.42
CRO (C)	1	0	47	33	1	0	56	9	8	35	17.90	940.28	447.56	16.61
WOM (C)	1	0	52	18	1	1	1	22	9	3	34.64	830.66	267.17	16.65
HAW (C)	1	1	15	57	1	1	19	50	3	53	2.12	909.35	840.59	16.84
CAL (C)	1	1	23	40	1	1	30	44	7	3	9.73	776.37	514.02	16.95
WHS (C)	1	1	26	11	1	1	34	6	7	54	25.81	801.74	262.17	17.00
MLA (C)	1	1	31	54	1	1	39	42	7	48	27.70	887.42	247.78	17.07

TABLE IV.- 0° ELEVATION ANGLE RADAR ACQUISITION AND LOSS SUMMARY FOR APOLLO 7 - Concluded

(d) S-IVB C-band sites - Concluded

MSFN STATION	ACQUISITION				LOSS				ELAPSED TIME		MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
PAT (C)	1	1	31	55	1	1	39	42	7	47	26.22	886.23	258.78	17.07
GBI (C)	1	1	32	35	1	1	40	12	7	36	15.16	794.41	389.85	17.07
BDA (C)	1	1	35	24	1	1	43	16	7	51	39.42	909.08	188.94	17.09
BDQ (C)	1	1	35	24	1	1	43	16	7	51	39.42	909.08	188.94	17.09
ANT (C)	1	1	38	29	1	1	43	11	4	42	3.12	803.40	761.97	17.09
CYI (C)	1	1	48	55	1	1	50	54	1	59	.72	913.53	913.53	17.17
ASC (C)	1	1	53	45	1	1	56	44	2	58	1.35	905.40	905.40	17.23
PRE (C)	1	2	3	1	1	2	11	4	8	3	14.15	935.23	497.25	17.36
TAN (C)	1	2	6	10	1	2	14	46	8	36	16.22	815.68	461.94	17.41
CRO (C)	1	2	22	20	1	2	31	19	8	58	39.35	1051.59	243.02	17.61
WOM (C)	1	2	27	40	1	2	34	44	7	3	8.43	828.30	651.69	17.63
HAW (C)	1	2	48	8	1	2	56	14	8	5	24.34	768.49	281.87	17.84
CAL (C)	1	2	57	45	1	3	5	31	7	46	22.94	836.24	286.86	17.96
WHS (C)	1	3	0	34	1	3	8	43	8	8	51.54	862.11	153.01	17.98
MLA (C)	1	3	6	33	1	3	14	38	8	4	43.86	824.26	175.23	18.05
PAT (C)	1	3	6	35	1	3	14	40	8	4	45.00	830.85	171.94	18.05
GBI (C)	1	3	7	14	1	3	15	11	7	56	52.90	921.40	153.53	18.07
BDA (C)	1	3	10	12	1	3	17	2	6	49	9.77	778.78	518.73	18.07
BDQ (C)	1	3	10	12	1	3	17	2	6	49	9.77	778.78	518.73	18.07
ANT (C)	1	3	11	57	1	3	19	46	7	48	17.36	825.33	365.78	18.11
ASC (C)	1	3	25	29	1	3	34	13	8	44	33.91	793.97	246.39	18.24
PRE (C)	1	3	37	1	1	3	46	3	9	2	54.66	1028.50	191.46	18.35
TAN (C)	1	3	42	17	1	3	49	2	6	45	6.51	937.63	743.45	18.39
CRO (C)	1	3	57	10	1	4	5	40	8	29	23.02	1055.04	355.44	18.58
HAW (C)	1	4	23	10	1	4	30	33	7	23	17.16	823.32	358.88	18.83
CAL (C)	1	4	32	15	1	4	39	56	7	40	30.39	746.37	229.21	18.94
WHS (C)	1	4	35	22	1	4	43	5	7	42	31.98	930.09	221.08	18.98
MLA (C)	1	4	41	26	1	4	48	36	7	9	13.16	847.92	441.00	19.03
PAT (C)	1	4	41	27	1	4	48	39	7	12	13.61	836.17	431.76	19.03
GBI (C)	1	4	42	3	1	4	49	23	7	20	14.79	931.83	411.36	19.04
ANT (C)	1	4	46	36	1	4	54	15	7	38	17.58	959.11	375.45	19.08
ASC (C)	1	5	0	55	1	5	8	8	7	13	9.35	1019.44	613.30	19.21
PRE (C)	1	5	12	2	1	5	20	44	8	42	23.48	1047.87	364.63	19.36
TAN (C)	1	5	17	53	1	5	24	20	6	26	5.76	1049.39	773.04	19.40
CRO (C)	1	5	34	24	1	5	36	53	2	28	.75	1008.86	971.16	19.53
HAW (C)	1	5	58	50	1	6	4	58	6	7	7.15	918.08	585.87	19.82
CAL (C)	1	6	6	57	1	6	13	53	6	56	12.28	934.48	449.73	19.92
WHS (C)	1	6	10	24	1	6	16	37	6	13	7.49	940.62	587.36	19.95

TABLE V.- SPACECRAFT LIGHTING SUMMARY

(a) CSM

ASSUMED LIFT-OFF TIME = YEAR 1968 MONTH 9 DAY 20 HR 10 MIN 0 SEC 0 E.S.T.

START IN LIGHT AT T = DAY 0 HR 2 MIN 54 SEC 55.00 SUN-LIGHT, EARTH-SHIELD

START IN LIGHT AT T= DAY 0 HR 2 MIN 54 SEC 55.00 MOON-LIGHT, EARTH-SHIELD

SUNRISE					SUNSET					MOONRISE					MOONSET					REVOLUTION
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	
															0	3	31	58.93	-19.51	3.17
					0	3	39	38.44	5.05											3.24
										0	4	8	59.64	122.08						3.58
0	4	15	3.89	142.43																3.63
					0	5	9	23.01	-17.40						0	5	1	52.18	-41.54	4.11
										0	5	38	51.83	100.11						4.18
0	5	44	47.74	119.92																4.52
					0	6	39	8.21	-39.81						0	6	31	45.69	-63.54	4.57
										0	7	8	43.75	78.12						5.05
0	7	14	30.32	97.35																5.12
					0	8	8	53.93	-62.19						0	8	1	39.43	-85.53	5.46
										0	8	38	35.39	56.11						5.51
0	8	44	14.36	74.86																5.99
					0	9	38	40.09	-84.54						0	9	31	33.37	-107.50	6.06
										0	10	8	26.70	34.09						6.40
0	10	14	1.31	52.52																6.43
					0	11	8	26.61	-106.86											6.93
										0	11	38	18.54	12.11						7.00
0	11	43	47.67	30.17											0	11	1	27.52	-129.45	7.34
					0	12	38	10.45	-129.31											7.37
										0	13	8	12.74	-9.76						7.87
0	13	13	33.35	7.79																7.95
					0	14	7	52.27	-151.86						0	12	31	21.84	-151.38	8.26
										0	14	38	6.85	-31.62						8.31
0	14	43	18.20	-14.63																8.81
					0	15	37	35.10	-174.34						0	14	1	16.32	-173.30	8.87
										0	16	8	.87	-53.49						9.20
																				9.25
															0	15	31	10.95	164.80	9.75
																				9.81
																				10.14
																				10.19
																				10.69
																				10.75
																				11.08

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
0	16	13	2.06	-37.10																11.13
															0	17	1	5.73	142.91	11.63
					0	17	7	18.77	163.23											11.69
										0	17	37	54.79	-75.36						12.02
0	17	42	44.73	-59.62																12.07
															0	18	31	.63	121.04	12.57
					0	18	37	3.14	140.84											12.63
										0	19	7	48.62	-97.23						12.96
0	19	12	25.91	-82.21																13.01
															0	20	0	55.64	99.18	13.51
					0	20	6	48.09	118.48											13.57
										0	20	37	42.34	-119.11						13.90
0	20	42	10.49	-104.62																13.93
															0	21	30	50.77	77.34	14.45
					0	21	36	33.52	96.17											14.51
										0	22	7	35.94	-140.99						14.84
0	22	11	56.47	-126.95																14.87
															0	23	0	46.00	55.51	15.39
					0	23	6	19.03	73.86											15.43
										0	23	37	23.95	-163.16						15.77
0	23	41	38.14	-149.50																15.82
															1	0	30	38.60	33.55	16.32
					1	0	35	58.33	51.24											16.38
										1	1	7	18.24	175.00						16.71
1	1	11	21.51	-171.95																16.75
															1	2	0	33.20	11.72	17.26
					1	2	5	43.36	28.93											17.32
										1	2	37	22.43	154.03						17.67
1	2	41	14.59	166.59																17.70
															1	3	31	28.00	-7.98	18.22
					1	3	36	24.50	8.34											18.25
										1	4	7	44.31	131.45						18.59
1	4	11	28.67	143.46																18.63
															1	5	0	40.06	-32.19	19.14
					1	5	5	20.78	-16.44											19.18
					1	5	22	51.	TPI	1	5	37	14.06	109.50						19.53
1	5	40	46.96	120.87																19.57
															1	6	30	25.42	-53.82	20.09
					1	6	34	52.95	-38.76											20.13
										1	7	7	2.50	87.69						20.48
1	7	10	23.02	98.37																20.51
															1	8	0	16.73	-75.52	21.03
					1	8	4	32.34	-61.06											21.07
										1	8	36	50.67	65.82						21.42
1	8	39	59.14	75.84																21.44
															1	9	30	8.24	-97.19	21.97
					1	9	34	12.74	-83.31											22.01
										1	10	6	38.28	43.93						22.36
1	10	9	40.13	53.58																22.38
															1	10	59	57.15	-118.98	22.89
					1	11	3	48.74	-105.77											22.93
										1	11	36	25.24	22.01						23.30

40:47
5:21
NITE = 35:26

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					REVOLUTION
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	
1	11	39	19.90	31.26																23.32
					1	12	33	23.46	-128.30						1	12	29	44.99	-140.82	23.84
										1	13	6	11.46	.05						23.87
1	13	8	58.10	8.87																24.24
					1	14	3	.19	-150.70						1	13	59	33.45	-162.60	24.26
										1	14	35	59.82	-21.80						24.78
1	14	38	34.24	-13.63																24.82
					1	15	32	38.46	-173.02						1	15	29	22.43	175.65	25.16
										1	16	5	50.19	-43.53						25.20
1	16	8	7.62	-36.26																25.72
					1	17	2	17.91	164.73						1	16	59	11.85	153.94	25.76
										1	17	35	40.30	-65.27						26.11
1	17	37	47.57	-58.54																26.14
					1	18	31	55.00	142.37						1	18	29	1.66	132.27	26.66
										1	19	5	30.12	-87.02						26.70
1	19	7	27.19	-80.83																27.05
					1	20	1	28.29	119.81						1	19	58	51.79	110.63	27.06
										1	20	35	19.61	-108.78						27.60
1	20	37	5.27	-103.19																27.62
					1	21	31	3.88	97.39						1	21	28	42.20	89.02	27.99
										1	22	5	8.71	-130.55						28.00
1	22	6	41.34	-125.65																28.54
					1	23	0	41.21	75.07						1	22	58	32.85	67.44	28.56
										1	23	34	57.38	-152.34						28.93
1	23	36	14.70	-148.26																28.95
					2	0	30	19.87	52.83						2	0	28	23.70	45.89	29.48
2	1	5	51.93	-170.64																29.50
					2	1	59	56.83	30.50	2	1	4	45.54	-174.15						29.87
2	2	35	31.20	167.09																29.89
					2	3	29	29.08	7.93	2	2	34	33.10	164.02	2	1	58	14.72	24.37	30.43
2	4	5	8.91	144.75																30.45
					2	4	59	3.84	-14.49	2	4	4	19.98	142.15						30.81
2	5	34	44.56	122.30																30.83
					2	6	28	40.48	-36.81	2	5	34	6.05	120.25	2	3	28	5.89	2.87	31.37
										2	7	3	56.25	98.59						31.39
																				31.75
															2	4	57	53.21	-18.81	31.75
																				32.31
															2	6	27	40.72	-40.46	32.31
																				32.69
																				32.69
																				33.25
																				33.25
																				33.63
																				33.63
																				34.17
																				34.19
																				34.58
																				34.58
																				35.12
																				35.14
																				35.50

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
2	7	4	17.43	99.71																35.52
					2	7	58	18.54	-59.03						2	7	57	28.76	-62.07	36.06
2	8	33	53.27	77.29																36.08
					2	9	27	54.06	-81.39	2	8	33	46.54	76.93						36.44
2	10	3	31.99	55.04																36.44
					2	10	57	25.74	-103.95	2	10	3	36.52	55.28	2	9	27	17.24	-83.64	37.00
2	11	33	9.08	32.70																37.00
					2	12	27	.03	-126.35											37.38
2	13	2	43.97	10.26						2	11	33	26.15	33.61						37.38
					2	13	56	36.25	-148.64						2	10	57	6.10	-105.16	37.94
2	14	32	15.88	-12.35						2	13	3	15.39	11.94						37.94
					2	15	26	13.93	-170.84											38.32
2	16	1	51.55	-34.74						2	14	33	4.17	-9.75						38.32
					2	16	55	46.77	166.70						2	12	26	55.27	-126.65	38.88
2	17	31	29.53	-56.99						2	16	2	52.41	-31.46						38.88
					2	18	25	18.38	144.18											39.26
2	19	1	5.70	-79.33						2	17	32	40.03	-53.19						39.26
					2	19	54	52.56	121.82						2	13	56	44.71	-148.10	39.83
2	20	30	39.45	-101.80						2	19	2	26.90	-74.95						39.83
					2	21	24	28.65	99.57											40.21
2	22	0	9.82	-124.45						2	20	32	12.89	-96.75						40.21
					2	22	54	6.15	77.42						2	15	26	34.37	-169.52	40.77
2	23	29	46.68	-146.73						2	22	2	.45	-118.45						40.77
					3	0	23	35.31	54.79											41.13
3	0	59	23.66	-168.99						2	23	31	50.39	-139.99						41.15
					3	1	53	7.29	32.34						2	16	56	24.22	169.09	41.69
3	2	28	58.58	168.64						3	1	1	39.97	-161.53						41.71
																				42.07
																				42.09
																				42.63
															2	18	26	14.23	147.73	42.65
																				43.01
																				43.03
																				43.58
															2	19	56	3.99	126.38	43.58
																				43.95
																				43.97
																				44.52
															2	21	25	49.53	104.81	44.52
																				44.90
																				44.90
																				45.46
															2	22	55	35.72	83.29	45.46
																				45.82
																				45.84
																				46.38
															3	0	25	22.46	61.83	46.40
																				46.76
																				46.78
																				47.32
															3	1	55	9.65	40.41	47.35
																				47.70

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					REVOLUTION
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	
										3	2	31	29.12	176.92						47.72
					3	3	22	41.69	10.04											48.27
															3	3	24	57.23	19.03	48.29
3	3	58	30.67	146.12																48.64
										3	4	1	17.79	155.35						48.66
					3	4	52	17.87	-12.15											49.21
															3	4	54	45.14	-2.30	49.23
3	5	28	1.04	123.51																49.57
										3	5	31	5.87	133.77						49.60
					3	6	21	50.53	-34.54											50.13
															3	6	24	33.32	-23.60	50.18
3	6	57	38.49	101.31																50.51
										3	7	0	53.28	112.17						50.55
					3	7	51	20.19	-57.09											51.07
															3	7	54	21.73	-44.86	51.12
3	8	27	14.13	79.02																51.45
										3	8	30	39.89	90.53						51.49
					3	9	20	52.87	-79.45											52.02
															3	9	24	10.33	-66.09	52.06
3	9	56	47.31	56.60																52.39
										3	10	0	25.53	68.85						52.43
					3	10	50	27.72	-101.68											52.96
															3	10	53	56.09	-87.48	52.98
3	11	26	17.03	33.98																53.33
										3	11	30	9.99	47.11						53.37
					3	12	20	3.68	-123.83											53.88
															3	12	23	39.98	-108.98	53.93
3	12	55	50.59	11.60																54.26
										3	12	59	57.53	25.58						54.30
					3	13	49	31.01	-146.48											54.82
															3	13	53	24.62	-130.41	54.87
3	14	25	26.64	-10.63																55.20
										3	14	29	46.37	4.16						55.24
					3	15	19	2.00	-168.91											55.77
															3	15	23	9.90	-151.78	55.81
3	15	55	.48	-32.98																56.14
										3	15	59	34.69	-17.26						56.18
					3	16	48	35.57	168.83											56.71
															3	16	52	55.71	-173.10	56.76
3	17	24	31.21	-55.49																57.08
										3	17	29	22.41	-38.71						57.12
					3	18	18	11.02	146.69											57.65
															3	18	22	41.97	165.62	57.70
3	18	54	.25	-78.11																58.01
										3	18	59	9.43	-60.18						58.07
					3	19	47	39.14	124.06											58.58
															3	19	52	32.39	144.54	58.63
3	20	23	58.99	-98.33																58.96
										3	20	29	14.67	-79.43						59.02
					3	21	16	40.25	102.24											59.53
															3	21	21	35.70	123.02	59.58
3	21	52	49.91	-120.85																59.91

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
										3	21	58	21.20	-100.93						59.95
					3	22	45	34.19	80.00											60.45
3	23	21	43.16	-143.22											3	22	50	48.89	102.21	60.52
										3	23	27	27.05	-122.45						60.83
					4	0	14	28.04	57.77											60.89
4	0	50	38.12	-165.48											4	0	19	55.98	81.00	61.39
										4	0	56	34.86	-143.81						61.46
					4	1	43	21.84	35.55											61.76
4	2	19	33.56	172.31											4	1	49	2.98	59.79	61.83
										4	2	25	42.92	-165.12						62.33
					4	3	12	12.50	13.15											62.40
4	3	48	29.97	150.17											4	3	18	6.28	38.34	62.70
										4	3	54	54.10	173.81						62.78
					4	4	41	6.39	-9.04											63.27
4	5	17	29.85	128.26											4	4	47	13.05	17.14	63.34
										4	5	24	5.19	152.78						63.64
					4	6	9	58.14	-31.34											63.73
4	6	46	20.53	105.81											4	6	16	20.86	-3.94	64.22
										4	6	53	12.44	131.51						64.29
					4	7	38	54.52	-53.34											64.59
4	8	15	17.09	83.73											4	7	45	24.29	-25.33	64.65
										4	8	22	17.83	110.12						65.14
					4	9	7	43.44	-75.78											65.22
4	9	44	9.82	61.44											4	9	14	34.68	-46.19	65.52
										4	9	51	27.74	89.11						65.61
					4	10	36	42.13	-97.59											66.10
4	11	13	2.11	39.14											4	10	43	34.59	-67.80	66.17
										4	11	20	28.78	67.46						66.47
					4	12	5	28.45	-120.16											66.53
4	12	41	57.65	17.05											4	12	12	44.87	-88.62	67.02
										4	12	49	40.59	46.66						67.10
					4	13	34	23.62	-142.16											67.40
4	14	10	44.30	-5.57											4	13	41	43.86	-110.27	67.49
										4	14	18	38.22	24.82						67.98
					4	15	3	13.21	-164.49											68.05
4	15	39	43.76	-27.36											4	15	10	52.18	-131.20	68.35
										4	15	47	51.37	4.19						68.41
					4	16	32	4.25	173.29											68.90
4	17	8	30.32	-49.96											4	16	39	51.99	-152.74	69.00
																				69.28
																				69.36
																				69.83
																				69.93
																				70.23
																				70.29
																				70.78
																				70.88
																				71.16
																				71.24
																				71.71
																				71.81
																				72.09

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					REVOLUTION
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	
										4	17	16	50.96	-17.45						72.20
					4	18	0	57.73	151.25											72.66
															4	18	8	58.43	-173.78	72.76
4	18	37	27.77	-71.84						4	18	46	.38	-38.30						73.04
					4	19	29	45.17	128.83											73.13
															4	19	37	58.90	164.76	73.59
4	20	6	16.66	-94.25						4	20	15	2.35	-59.69						73.69
					4	20	58	42.02	107.04											73.97
																				74.08
4	21	35	9.09	-116.41						4	21	44	7.80	-80.78						74.54
					4	22	27	26.34	84.47						4	21	7	3.54	143.62	74.64
																				74.92
4	23	4	1.27	-138.56						4	23	13	11.42	-101.98						75.01
					4	23	56	18.73	62.43											75.47
															4	22	36	4.49	122.23	75.57
5	0	32	46.81	-161.13						5	0	42	13.77	-123.24						75.85
					5	1	25	14.73	40.54											75.96
																				76.40
5	2	1	45.31	176.53						5	2	11	26.75	-144.45	5	0	5	7.50	101.00	76.52
					5	2	54	17.27	18.54											76.80
																				76.89
5	3	30	48.95	154.52						5	3	40	39.12	-165.67						77.35
					5	4	23	12.22	-3.93						5	1	34	21.92	80.30	77.47
																				77.72
5	4	59	44.75	132.01						5	5	9	47.20	172.82						77.83
					5	5	52	14.75	-25.89											78.30
															5	3	3	31.32	58.82	78.39
5	6	28	47.66	109.99						5	6	39	3.74	151.98						78.67
					5	7	21	8.61	-48.40											78.78
																				79.22
5	7	57	43.25	87.51						5	8	8	7.24	130.16	5	4	32	41.35	37.41	79.34
					5	8	50	11.34	-70.30											79.59
																				79.71
5	9	26	45.17	65.46						5	9	37	24.39	109.43						80.17
					5	10	19	3.95	-92.86						5	6	1	56.02	16.36	80.27
																				80.54
5	10	55	40.81	43.02						5	11	6	34.11	88.14						80.66
					5	11	48	7.05	-114.70											81.10
															5	7	31	.82	-5.42	81.22
5	12	24	41.42	20.93																81.47
																				81.61
																				82.05
															5	9	0	14.73	-26.50	82.17
																				82.42
																				82.54
																				82.98
															5	10	29	20.42	-48.19	83.10
																				83.35
																				83.49
																				83.93
															5	11	58	30.82	-69.51	84.05
																				84.30

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
										5	12	35	42.15	66.75						84.41
					5	13	16	58.30	-137.31											84.86
5	13	53	37.39	-1.45											5	13	27	40.25	-90.89	84.98
										5	14	4	55.93	45.82						85.22
					5	14	46	1.60	-159.09											85.37
5	15	22	36.32	-23.61																85.78
										5	15	33	57.65	23.99	5	14	56	46.56	-112.49	85.93
					5	16	14	51.69	178.25											86.17
5	16	51	32.95	-45.91																86.29
										5	17	3	14.18	3.33						86.73
					5	17	43	52.34	156.33						5	16	26	.43	-133.51	86.85
5	18	20	29.77	-68.17																87.10
										5	18	32	18.31	-18.28						87.24
					5	19	12	44.21	133.83											87.66
5	19	49	27.42	-90.36											5	17	55	1.98	-155.44	87.80
										5	20	1	29.76	-39.29						88.05
					5	20	41	42.13	111.77											88.20
5	21	18	21.56	-112.77																88.61
										5	21	30	38.37	-60.51	5	19	24	13.95	-176.59	88.75
					5	22	10	35.91	89.44											88.98
5	22	47	20.73	-134.81																89.12
										5	22	59	43.22	-81.98						89.54
					5	23	39	31.09	67.23						5	20	53	17.06	161.63	89.68
6	0	16	11.47	-157.40																89.93
										6	0	28	54.94	-102.93						90.07
					6	1	8	26.86	45.07											90.49
6	1	45	12.76	-179.26											5	22	22	26.14	140.30	90.63
										6	1	57	54.93	-124.72						90.86
					6	2	37	19.34	22.71											91.00
6	3	14	.55	157.98																91.42
										6	3	27	8.84	-145.47	5	23	51	31.77	118.72	91.56
					6	4	6	17.09	.74											91.81
6	4	43	3.36	136.27																91.95
										6	4	56	7.48	-167.33						92.37
					6	5	35	6.98	-21.76						6	1	20	37.69	97.18	92.51
6	6	11	52.28	113.64																92.73
										6	6	25	20.62	171.90						92.88
					6	7	4	6.70	-43.56											93.30
6	7	40	52.32	91.78											6	2	49	46.08	75.83	93.44
																				93.66
																				93.83
															6	4	18	48.57	54.07	94.25
																				94.39
																				94.61
																				94.78
															6	5	47	59.90	32.94	95.17
																				95.32
																				95.54
																				95.71
																				96.13
															6	7	16	58.74	10.95	96.27
																				96.49

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
										6	7	54	23.30	150.37						96.66
					6	8	32	54.11	-66.19											97.05
															6	8	46	9.06	-10.23	97.21
6	9	9	42.81	69.29																97.42
										6	9	23	30.66	129.21						97.59
					6	10	1	51.78	-88.09											97.98
															6	10	15	8.13	-32.17	98.14
6	10	38	39.31	47.24																98.37
										6	10	52	36.18	107.92						98.54
					6	11	30	40.78	-110.57											98.93
															6	11	44	16.48	-53.46	99.09
6	12	7	31.98	24.94																99.30
										6	12	21	39.17	86.47						99.47
					6	12	59	34.26	-132.71											99.86
															6	13	13	16.68	-75.30	100.02
6	13	36	23.91	2.62																100.25
										6	13	50	46.74	65.35						100.42
					6	14	28	27.05	-154.89											100.81
															6	14	42	23.06	-96.71	100.97
6	15	5	19.59	-19.42																101.18
										6	15	19	46.36	43.69						101.35
					6	15	57	16.79	-177.26											101.74
															6	16	11	24.29	-118.45	101.90
6	16	34	5.39	-42.14																102.13
										6	16	48	55.37	22.70						102.30
					6	17	26	12.96	160.85											102.69
															6	17	40	28.77	-139.97	102.85
6	18	3	5.34	-63.83																103.06
										6	18	17	52.34	.89						103.23
					6	18	54	59.38	138.29											103.62
															6	19	9	30.88	-161.63	103.78
6	19	31	51.69	-86.47																103.99
										6	19	47	2.36	-20.01						104.18
					6	20	23	56.15	116.48											104.55
															6	20	38	33.55	176.76	104.73
6	21	0	48.79	-108.31																104.94
										6	21	15	53.41	-42.55						105.12
					6	21	54	51.48	99.20											105.52
															6	22	9	49.57	155.95	105.67
6	22	31	25.55	-131.68																105.87
										6	22	46	35.23	-64.72						106.05
					6	23	25	22.01	76.27											106.45
															6	23	40	40.11	134.08	106.60
7	0	2	1.80	-154.26																106.80
										7	0	17	25.48	-86.35						107.00
					7	0	55	55.03	53.53											107.38
															7	1	11	24.06	111.83	107.55
7	1	32	32.75	-177.22																107.73
										7	1	48	12.31	-108.19						107.93
					7	2	26	31.59	31.07											108.31
															7	2	42	9.95	89.70	108.48
7	3	3	7.38	160.10																108.69

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
					7	3	57	6.00	8.45	7	3	18	51.00	-130.54						108.88
																				109.27
7	4	33	46.26	137.76											7	4	12	59.66	67.80	109.43
					7	5	27	36.96	-14.39	7	4	49	45.94	-151.87						109.62
																				109.81
7	6	4	18.66	114.96											7	5	43	41.84	45.47	110.20
					7	6	58	10.75	-37.02	7	6	20	28.26	-173.98						110.36
																				110.55
7	7	34	47.14	91.87																110.74
															7	7	14	30.02	23.48	111.13
					7	8	28	48.56	-59.34	7	7	51	14.35	164.14						111.29
																				111.48
7	9	5	27.41	69.68																111.70
					7	9	59	18.23	-82.24	7	9	22	2.77	142.41						112.06
															7	8	45	15.32	1.35	112.24
7	10	36	2.02	47.09																112.43
					7	11	29	49.52	-105.01	7	10	52	41.88	120.12						112.63
																				113.01
7	12	6	31.77	24.15											7	10	15	59.01	-20.87	113.17
					7	13	0	23.92	-127.53	7	12	23	32.89	98.55						113.36
																				113.56
7	13	37	4.10	1.42																113.94
					7	14	30	58.89	-150.01	7	13	54	16.84	76.55	7	11	46	49.75	-42.69	114.11
																				114.29
7	15	7	42.16	-20.87																114.51
					7	16	1	27.97	-172.89	7	15	24	56.02	54.28						114.87
															7	13	17	30.17	-65.08	115.05
7	16	38	13.86	-43.62																115.25
					7	17	31	59.42	164.41	7	16	55	47.96	32.77						115.44
																				115.83
7	18	8	41.67	-66.64											7	14	48	15.48	-87.18	115.99
					7	19	2	34.19	141.97	7	18	26	28.69	10.59						116.18
																				116.39
7	19	39	17.92	-89.02																116.76
					7	20	33	6.13	119.33	7	19	57	13.11	-11.36	7	16	19	2.96	-109.16	116.94
																				117.11
7	21	9	52.71	-111.48																117.33
					7	22	3	35.05	96.48	7	21	28	.34	-33.14						117.69
															7	17	49	44.13	-131.48	117.87
7	22	40	22.34	-134.32																118.04
																				118.26
																				118.62
															7	19	20	31.13	-153.47	118.80
																				118.99
																				119.21
																				119.58
															7	20	51	14.92	-175.63	119.75
																				119.93
																				120.14
																				120.51
															7	22	21	57.09	162.14	120.68
																				120.86

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
										7	22	58	38.66	-55.44						121.07
					7	23	34	6.41	73.84											121.44
															7	23	52	45.80	140.26	121.61
8	0	10	48.70	-157.39																121.79
										8	0	29	26.68	-77.18						122.02
					8	1	4	41.20	51.45											122.37
															8	1	23	25.78	117.93	122.56
8	1	41	27.13	-179.54																122.74
										8	2	0	10.50	-99.15						122.96
					8	2	35	10.75	28.69											123.32
															8	2	54	8.90	95.77	123.50
8	3	11	59.68	157.89																123.67
										8	3	30	46.98	-121.53						123.89
					8	4	5	39.29	5.88											124.25
															8	4	24	56.45	73.86	124.45
8	4	42	27.80	135.01																124.60
										8	5	1	37.47	-143.12						124.84
					8	5	36	10.28	-16.74											125.19
															8	5	55	35.42	51.51	125.38
8	6	12	54.97	112.06																125.56
										8	6	32	18.76	-165.23						125.77
					8	7	6	44.68	-39.09											126.12
															8	7	26	19.39	29.43	126.31
8	7	43	32.38	89.91																126.49
										8	8	2	56.34	172.47						126.72
					8	8	37	12.66	-61.91											127.07
															8	8	57	4.38	7.41	127.26
8	9	14	3.39	67.29																127.42
										8	9	33	45.95	150.83						127.65
					8	10	7	40.59	-84.71											128.00
															8	10	27	43.71	-14.89	128.19
8	10	44	30.43	44.38																128.35
										8	11	4	25.31	128.64						128.59
					8	11	38	10.90	-107.32											128.93
															8	11	58	28.39	-36.91	129.12
8	12	14	58.03	21.53																129.31
										8	12	35	5.56	106.50						129.54
					8	13	8	44.48	-129.68											129.86
															8	13	29	10.96	-59.01	130.07
8	13	45	33.98	-.66																130.24
										8	14	5	52.39	84.72						130.47
					8	14	39	11.80	-152.49											130.82
															8	14	59	50.52	-81.27	131.01
8	15	16	3.99	-23.29																131.17
										8	15	36	30.28	62.46						131.40
					8	16	9	38.91	-175.29											131.75
															8	16	30	35.69	-103.22	131.94
8	16	46	30.28	-46.19																132.10
										8	17	7	12.19	40.43						132.35
					8	17	40	8.23	162.08											132.68
															8	18	1	16.09	-125.41	132.89
8	18	16	59.20	-68.88																133.04

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM- Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
										8	18	38	1.52	18.87						133.29
					8	19	10	22.20	139.05											133.62
															8	19	31	44.77	-147.55	133.83
8	19	47	13.91	-91.75																133.97
										8	20	8	31.41	-3.16						134.22
					8	20	40	40.80	116.52											134.55
															8	21	2	13.48	-169.70	134.76
8	21	17	36.49	-113.98																134.93
										8	21	38	57.50	+25.39						135.16
					8	22	11	.47	94.08											135.49
															8	22	32	44.89	168.31	135.70
8	22	47	56.99	-136.36																135.86
										8	23	9	25.61	-47.50						136.11
					8	23	41	19.41	71.61											136.44
															9	0	3	18.49	146.43	136.65
9	0	18	15.25	-158.89																136.79
										9	0	40	.61	+69.23						137.04
					9	1	11	34.08	48.84											137.38
															9	1	33	44.36	124.20	137.58
9	1	48	31.80	178.47																137.73
										9	2	10	29.77	-91.26						137.98
					9	2	41	49.15	26.12											138.31
															9	3	4	12.08	102.06	138.52
9	3	18	47.02	155.74																138.66
										9	3	40	55.29	-113.49						138.91
					9	4	12	4.69	3.45											139.25
															9	4	34	42.29	80.07	139.45
9	4	49	1.19	132.96																139.60
										9	5	11	20.84	-135.69						139.86
					9	5	42	20.79	-19.16											140.18
															9	6	5	15.71	58.25	140.40
9	6	19	14.50	110.12																140.53
										9	6	41	55.63	-157.40						140.80
					9	7	12	37.57	-41.70											141.12
															9	7	35	40.49	36.02	141.34
9	7	49	35.34	87.89																141.49
										9	8	12	24.59	-179.40						141.73
					9	8	42	55.18	-64.17											142.05
															9	9	6	6.91	13.89	142.27
9	9	19	54.09	65.52																142.42
										9	9	42	49.86	158.40						142.67
					9	10	13	13.78	-86.54											142.98
															9	10	36	35.51	-8.12	143.21
9	10	50	10.88	43.01																143.36
										9	11	13	12.64	136.09						143.60
					9	11	43	27.30	-109.28											143.94
															9	12	7	7.11	-29.96	144.14
9	12	20	26.16	20.41																144.29
										9	12	43	46.15	114.36						144.55
					9	13	13	40.61	-132.01											144.87
															9	13	37	33.18	-52.06	145.09
9	13	50	40.24	-2.26																145.22

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Continued

SUNRISE					SUNSET					MOONRISE					MOONSET					REVOLUTION
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	
										9	14	14	15.48	92.42						145.49
					9	14	43	54.23	-154.70											145.81
9	15	20	53.35	-24.99											9	15	7	58.02	-74.20	146.03
										9	15	44	40.88	70.28						146.16
					9	16	14	8.20	-177.35											146.42
9	16	51	5.65	-47.76											9	16	38	24.70	-96.24	146.74
										9	17	15	3.64	48.01						146.96
					9	17	44	22.59	160.06											147.09
9	18	21	18.82	-70.45											9	18	8	53.82	-118.13	147.36
										9	18	45	31.26	26.01						147.68
					9	19	14	37.49	137.51											147.90
9	19	51	37.23	-92.71											9	19	39	22.53	-140.02	148.05
										9	20	16	1.77	4.19						148.31
					9	20	44	52.98	115.03											148.61
9	21	21	53.62	-115.10											9	21	9	45.63	-162.17	148.85
										9	21	46	27.83	-17.87						148.99
					9	22	15	9.16	92.62											149.25
9	22	52	1.56	-138.13											9	22	40	10.18	175.76	149.55
										9	23	16	33.56	-41.28						149.79
					9	23	45	50.91	69.96											149.92
10	0	22	41.05	-159.17											10	0	10	35.04	152.74	150.18
										10	0	47	.21	-63.28						150.48
					10	1	16	4.89	47.41											150.72
10	1	52	57.11	178.46											10	1	40	59.51	130.71	150.84
										10	2	17	29.25	-85.15						151.11
					10	2	46	19.34	24.92											151.43
10	3	23	13.81	156.16											10	3	11	21.88	108.59	151.65
										10	3	47	54.62	-107.19						151.78
					10	4	16	34.34	2.48											152.06
10	4	53	28.70	133.73											10	4	41	45.80	86.56	152.36
										10	5	18	17.42	-129.37						152.60
					10	5	46	48.18	-20.03											152.74
10	6	23	42.18	111.22											10	6	12	11.83	64.66	153.00
										10	6	48	38.31	-151.63						153.30
					10	7	16	58.98	-42.74											153.54
10	7	53	54.53	88.64											10	7	42	40.71	42.93	153.68
										10	8	19	5.67	-173.52						153.93
					10	8	47	9.88	-65.43											154.23
10	9	24	5.95	66.01											10	9	13	2.33	20.85	154.47
																				154.61
																				154.87
																				155.19
																				155.41
																				155.55
																				155.80
																				156.12
																				156.34
																				156.48
																				156.76
																				157.06
																				157.30
																				157.42

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Continued

(a) CSM - Concluded

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
										10	9	49	32.68	164.57						157.69
					10	10	17	20.91	-88.09											157.99
															10	10	43	23.69	-1.23	158.23
10	10	54	16.61	43.34																158.35
										10	11	19	56.54	142.52						158.63
					10	11	47	32.09	-110.72											158.93
															10	12	13	46.47	-23.22	159.17
10	12	24	26.62	20.63																159.28
										10	12	50	18.10	120.35						159.56
					10	13	17	43.45	-133.33											159.86
															10	13	44	11.14	-45.08	160.10
10	13	54	36.06	-2.10																160.22
										10	14	20	37.95	98.10						160.50
					10	14	47	55.00	-155.90											160.80
															10	15	14	38.39	-66.79	161.04
10	15	24	45.52	-24.81																161.18
										10	15	51	3.59	76.19						161.45
					10	16	18	6.78	-178.44											161.73
															10	16	44	59.59	-88.79	162.00
10	16	55	.70	-47.05																162.11
										10	17	21	29.47	54.31						162.39
					10	17	48	18.81	159.05											162.67
															10	18	15	19.54	-110.85	162.93
10	18	25	14.27	-69.41																163.05
										10	18	51	52.40	32.29						163.32
					10	19	18	31.12	136.58											163.61
															10	19	45	36.65	-133.20	163.86

TABLE V.- SPACECRAFT LIGHTING SUMMARY

(b) S - IVB

ASSUMED LIFT-OFF TIME = YEAR 1968 MONTH 9 DAY 20 HR 10 MIN 0 SEC 0 E.S.T.

START IN LIGHT AT T = DAY 0 HR 2 MIN 55 SEC .00 SUN-LIGHT, EARTH-SHIELD

START IN LIGHT AT T= DAY 0 HR 2 MIN 55 SEC .00 MOON-LIGHT, EARTH-SHIELD

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
					0	3	39	40.06	5.14						0	3	31	59.38	-19.48	3.17
										0	4	8	58.75	121.86						3.24
0	4	15	3.55	142.21																3.58
					0	5	9	28.89	-17.34						0	5	1	57.70	-41.49	3.63
										0	5	38	55.91	99.90						4.11
0	5	44	52.34	119.72																4.18
					0	6	39	17.54	-39.80						0	6	31	55.54	-63.50	4.51
										0	7	8	52.55	77.95						4.57
0	7	14	39.97	97.20																5.05
					0	8	9	6.02	-62.24						0	8	1	52.93	-85.50	5.12
										0	8	38	48.64	55.99						5.45
0	8	44	26.23	74.64																5.51
					0	9	38	54.35	-84.65						0	9	31	49.87	-107.49	5.99
										0	10	8	44.14	34.03						6.06
0	10	14	14.03	52.19																6.39
					0	11	8	42.53	-107.03						0	11	1	46.39	-129.47	6.45
										0	11	38	39.03	12.06						6.93
0	11	44	3.14	29.85																7.00
					0	12	38	30.54	-129.39						0	12	31	42.48	-151.44	7.33
										0	13	8	33.24	-9.91						7.37
0	13	13	51.41	7.49																7.87
					0	14	8	17.64	-151.76						0	14	1	38.17	-173.40	7.94
										0	14	38	26.74	-31.89						8.27
0	14	43	38.72	-14.89																8.31
					0	15	37	59.94	-174.35						0	15	31	33.48	164.66	8.81
										0	16	8	19.65	-53.88						8.88
																				9.21
																				9.25
																				9.75
																				9.80
																				10.15
																				10.19
																				10.69
																				10.74
																				11.07

TABLE V.- SPACECRAFT LIGHTING SUMMARY - Concluded

(b) S - IVB - Concluded

SUNRISE					SUNSET					MOONRISE					MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	REVOLUTION
0	16	13	24.92	-37.29																11.13
															0	17	1	28.41	142.74	11.63
					0	17	7	42.70	163.12											11.68
										0	17	38	14.54	-75.73						12.01
0	17	43	9.83	-59.72																12.07
															0	18	31	22.99	120.83	12.57
					0	18	37	25.84	140.65											12.62
										0	19	8	8.96	-97.57						12.95
0	19	12	53.18	-82.20																13.01
															0	20	1	17.23	98.94	13.51
					0	20	7	9.30	118.23											13.56
										0	20	38	2.90	-119.41						13.89
0	20	42	34.64	-104.75																13.95
															0	21	31	11.14	77.07	14.45
					0	21	36	52.98	95.86											14.50
										0	22	7	56.30	-141.25						14.84
0	22	12	15.89	-127.27																14.87
															0	23	1	4.73	55.22	15.39
					0	23	6	36.84	73.53											15.44
										0	23	37	47.58	-163.17						15.79
0	23	42	2.70	-149.47																15.82
															1	0	30	58.64	33.42	16.32
					1	0	36	15.41	50.97											16.38
										1	1	7	37.25	174.86						16.73
1	1	11	41.95	-172.02																16.76
															1	2	0	50.15	11.55	17.26
					1	2	5	57.50	28.62											17.32
										1	2	37	31.23	153.15						17.66
1	2	41	24.30	165.62																17.70
															1	3	30	44.03	-10.17	18.20
					1	3	35	37.13	6.19											18.26
										1	4	7	18.29	131.11						18.59
1	4	11	1.70	143.03																18.62
															1	5	0	39.29	-31.78	19.14
					1	5	5	21.25	-15.98											19.18
										1	5	37	8.83	109.27						19.53
1	5	40	42.31	120.65																19.57

TABLE VI.- AS-205/CSM-101 LAUNCH VEHICLE OPERATIONAL TRAJECTORY FLIGHT SEQUENCE OF EVENTS[a]

Nominal flight time		Program time, sec	Event
hr:min:sec	sec		
-0:0:05.0	-5.00	--	Guidance reference release (GRR).
-0:0:03.1	-3.10	--	Initiate S-IB mainstage ignition sequence.
0:0:00.0	0.00	--	First motion.
0:0:00.2	0.20	$(0.0)_1$	Lift-off signal; initiate time base 1.
0:0:10.2	10.20	$(10.0)_1$	Initiate pitch and roll maneuvers.
0:1:16.0	76.0	--	Maximum dynamic pressure.
0:1:40.2	100.20	$(100.0)_1$	Control gain switch point.
0:2:00.2	120.20	$(120.0)_1$	Control gain switch point.
0:2:13.9	133.91	$(133.71)_1$	Enable S-IB propellant level sensors.
0:2:14.5	134.50	$(134.3)_1$	Tilt arrest.
0:2:17.4	137.41	$(0.0)_2$	Level sensor activation; initiate time base 2.
0:2:20.6	140.61	$(3.2)_2$	Inboard engine cutoff (IECO).
0:2:23.6	143.61	$(0.0)_3$	Outboard engine cutoff (OECO); initiate time base 3.
0:2:24.9	144.91	$(1.3)_3$	Separation signal.
0:2:25.0	144.99	--	S-IB/S-IVB physical separation.
0:2:26.3	146.31	$(2.7)_3$	J-2 engine start command.
0:2:28.7	148.66	--	Ullage burn out.
0:2:29.9	149.91	--	90% J-2 thrust level.

[a]This table was obtained from reference 5.

TABLE VI.- AS-205/CSM-101 LAUNCH VEHICLE OPERATIONAL TRAJECTORY FLIGHT SEQUENCE OF EVENTS[a] - Concluded

Nominal flight time hr:min:sec	Nominal flight time sec	Program time, sec	Event
0:2:32.3	152.31	$(8.7)_3$	Command P. U. system activation.
0:2:36.9	156.91	$(13.3)_3$	Jettison ullage rocket motors.
0:2:43.6	163.61	--	Jettison launch escape tower.
0:2:48.6	168.61	$(25.0)_3$	Command IGM initiation.
0:5:43.6	343.61	$(200.0)_3$	Control gain switch point.
0:7:53.5	473.50	--	EMR sensed by IGM.
0:9:53.6	593.63	--	Guidance cutoff signal (GCS).
0:9:53.8	593.83	$(0.0)_4$	Initiate time base 4 (reflects an approximate 0.2-second systems delay).
0:10:3.6	603.63	--	Orbital insertion.

[a]This table was obtained from reference 5.

TABLE VII.- APOLLO 7 MISSION SEQUENCE OF EVENTS

Event	Rev no	g.e.t., day:hr:min	Burn duration, sec	ΔV, fps	Pitch[a]	Yaw[b]	Resultant h_p/h_a	Purpose	Thrust vector control mode	Station in contact
Orbit insertion	1	0:00:10					123-153	Insert into 123- by 153-n. mi. orbit (above Cape Kennedy reference radius)		ETR
S-IVB/CSM separation (RCS)	2	0:02:55	2.6	1	0	0	127-170	Separate from S-IVB	G&N	HAW
SM RCS phasing burn	3	0:03:20	19.2	7.5	-.5	180	126-168	Set up proper phase offset for rendezvous	G&N	ANG
First SPS burn	17	1:02:25	9.6	209	-72	-3	121-198	Corrective combination maneuver	G&N	CRO
Second SPS burn	18	1:04:00	8.4	185.6	59	180	117-157	NSR (concentric maneuver)	G&N	CRO
TPI (RCS)	19	1:05:23	42.2	17.1	32.77	6.0	125-157	Terminal phase initiate	G&N	ACN
Separation after rendezvous	20	1:06:20	4.9	2	0	0	124-164	To assure no recontact problem with CSM and S-IVB	G&N	TEX LOS + 2 min
Third SPS burn	58	3:19:43	5.1	115.7	17.7	-122.0	96-155	Position and size ellipse for CM RCS deorbit to ETR, sets up auxiliary gauging system test	SCS	CRO
Fourth SPS burn	77	5:00:52	.5	15.0	+3	0	94-160	Minimum impulse test	G&N	ETR
Fifth SPS burn	105	6:21:08	61.5	1465	2.9	82	97-242	Gauging test, adjust ellipse for life time, position and size ellipse for CM RCS deorbit	G&N/MTV[c]	ETR
Sixth SPS burn	132	8:18:13	.5	16.9	3.0	180	91-232	Minimum impulse test	G&N	ETR
Seventh SPS burn	151	9:23:05	7.7	203	87	0	92-228	True anomaly adjust for deorbit burn	SCS	ETR
Eighth SPS burn	163	10:19:40	10.2	278.3	-49	180	-11-221	Deorbit	G&N	HAW

[a]Pitch from local horizontal.

[b]Yaw from velocity vector.

[c]The parameters for the orbit insertion burn are contained in reference five.

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS

(a) Maneuver 1

Target

T_{ig}, days:hr:min:sec, g.e.t.	01:02:24:55.1
ΔV_x, fps	54.78
ΔV_y, fps	-1.34
ΔV_z, fps	201.62
Weight, lb	32401.9
SPS engine pitch trim setting, deg	-2.9520
SPS engine yaw trim setting, deg	0.6143

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} 0.061059295 & 0.99170837 & 0.11307632 \\ -0.50806877 & 0.12839324 & -0.85169318 \\ -0.85914949 & -0.0054467631 & 0.51169565 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}_{MNBY}$$

Gimbal Angles at T_{ig}

IGA, deg	279.5
MGA, deg	-1.1
OGA, deg	-1.8

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Continued

(b) Maneuver 2

Target

T_{ig}, days:hr:min:sec, g.e.t.	01:03:59:55.8
ΔV_x, fps	-87.88
ΔV_y, fps	0.36
ΔV_z, fps	-163.80
Weight, lb	31732.5
SPS engine pitch trim setting, deg	-2.9653
SPS engine yaw trim setting, deg	0.5072

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} 0.061059295 & 0.99170837 & 0.11307632 \\ -0.50806877 & 0.12839324 & -0.85169318 \\ -0.85914949 & -0.0054467631 & 0.51169565 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}_{MNBY}$$

Gimbal Angles at T_{ig}

IGA, deg	93.6
MGA, deg	-0.5
OGA, deg	1.0

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Continued

(c) TPI Maneuver (RCS)

Target

T_{ig}, days:hr:min:sec, g.e.t.	01:05:22:51.2
ΔV_x, fps	14.17
ΔV_y, fps	1.12
ΔV_z, fps	-8.87
Weight, lb	31 169.4

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} 0.061059295 & 0.99170837 & 0.11307632 \\ -0.50806877 & 0.12839324 & -0.85169318 \\ -0.85914949 & -0.0054467631 & 0.51169565 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}$$

Gimbal angles at T_{ig}

IGA, deg	31.0
MGA, deg	4.2
OGA, deg	-3.0

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Continued

(d) Maneuver 3

Target

T_{ig}, days:hr:min:sec, g.e.t.	03:19:42:35.0
ΔV_x, fps	-58.69
ΔV_y, fps	95.70
ΔV_z, fps	-29.20
Weight, lb	31035.4
SPS engine pitch trim setting, deg	-2.9793
SPS engine yaw trim setting, deg	0.3957

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} -0.79943695 & -0.10030827 & -0.59231646 \\ -0.55257956 & -0.26406142 & 0.79052348 \\ -0.23570397 & 0.95927566 & 0.15567216 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}_{MNBY}$$

Gimbal Angles at T_{ig}

IGA, deg	0.0
MGA, deg	0.0
OGA, deg	0.0

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Continued

(e) Maneuver 4

Target

T_{ig}, days:hr:min:sec, g.e.t.	05:00:52:2.0
ΔV_x, fps	15.00
ΔV_y, fps	0.00
ΔV_z, fps	0.00
Weight, lb	30683.1
SPS engine pitch trim setting, deg	-2.9863
SPS engine yaw trim setting, deg	0.3330

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} -0.42871770 & -0.88441467 & -0.18442287 \\ -0.38018884 & 0.36179472 & -0.85121149 \\ 0.81954715 & -0.29481392 & -0.49135239 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}_{MNBY}$$

Gimbal Angles at T_{ig}

IGA, deg	0.0
MGA, deg	0.0
OGA, deg	0.0

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Continued

(f) Maneuver 5

Target

T_{ig}, days:hr:min:sec, g.e.t.	06:21:07:49.0
ΔV_x, fps	120.00
ΔV_y, fps	1464.10
ΔV_z, fps	5.00
Weight, lb	30635.8
SPS engine pitch trim setting, deg	-2.9873
SPS engine yaw trim setting, deg	0.3245

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} -0.37044526 & 0.44714534 & -0.81414453 \\ 0.88847341 & 0.42620702 & -0.17018388 \\ 0.27089718 & -0.78638959 & -0.55516312 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}$$ MNBY

Gimbal Angles at T_{ig}

IGA, deg	0.0
MGA, deg	0.0
OGA, deg	0.0

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Continued

(g) Maneuver 6

Target

T_{ig}, days:hr:min:sec, g.e.t.	08:18:13:14.7
ΔV_x, fps	-17.00
ΔV_y, fps	0.00
ΔV_z, fps	0.00
Weight, lb	26470.1
SPS engine pitch trim setting, deg . . .	-3.0200
SPS engine yaw trim setting, deg	-0.4054

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} 0.92130550 & -0.27445376 & -0.27544741 \\ 0.10428954 & -0.50801844 & 0.85500931 \\ -0.37459289 & -0.81645108 & -0.43941753 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}_{MNBY}$$

Gimbal Angles at T_{ig}

IGA, deg	0.0
MGA, deg	0.0
OGA, deg	0.0

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Continued

(h) Maneuver 7

Target

T_{ig}, days:hr:min:sec, g.e.t.	09:23:04:36.7
ΔV_x, fps	0.00
ΔV_y, fps	0.00
ΔV_z, fps	-203.00
Weight, lb	26417.7
SPS engine pitch trim setting, deg . . .	-3.0200
SPS engine yaw trim setting, deg	-0.4148

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} -0.63840810 & 0.65019936 & 0.41191727 \\ -0.026486846 & 0.51629227 & -0.85600274 \\ -0.76924217 & -0.55738948 & -0.31238344 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}_{MNBY}$$

Gimbal Angles at T_{ig}

IGA, deg	0.0
MGA, deg	0.0
OGA, deg	0.0

TABLE VIII.- TARGET LOADS FOR APOLLO 7

ORBITAL MANEUVERS - Concluded

(i) Maneuver 8

Target

T_{ig}, days:hr:min:sec, g.e.t.	10:19:39:53.8
ΔV_x, fps	-191.20
ΔV_y, fps	0.00
ΔV_z, fps	203.05
Weight, lb	25886.9
SPS engine pitch trim setting, deg . . .	-3.0200
SPS engine yaw trim setting, deg	-0.5126

REFSMMAT

$$\begin{bmatrix} X_{SM} \\ Y_{SM} \\ Z_{SM} \end{bmatrix} = \begin{bmatrix} 0.47771665 & 0.73540939 & 0.48058276 \\ 0.032181752 & 0.53202425 & -0.84611731 \\ -0.87792432 & 0.41967032 & 0.23049008 \end{bmatrix} \begin{bmatrix} X_I \\ Y_I \\ Z_I \end{bmatrix}_{MNBY}$$

Gimbal Angles at T_{ig}

IGA, deg	180.0
MGA, deg	0.0
OGA, deg	180.0

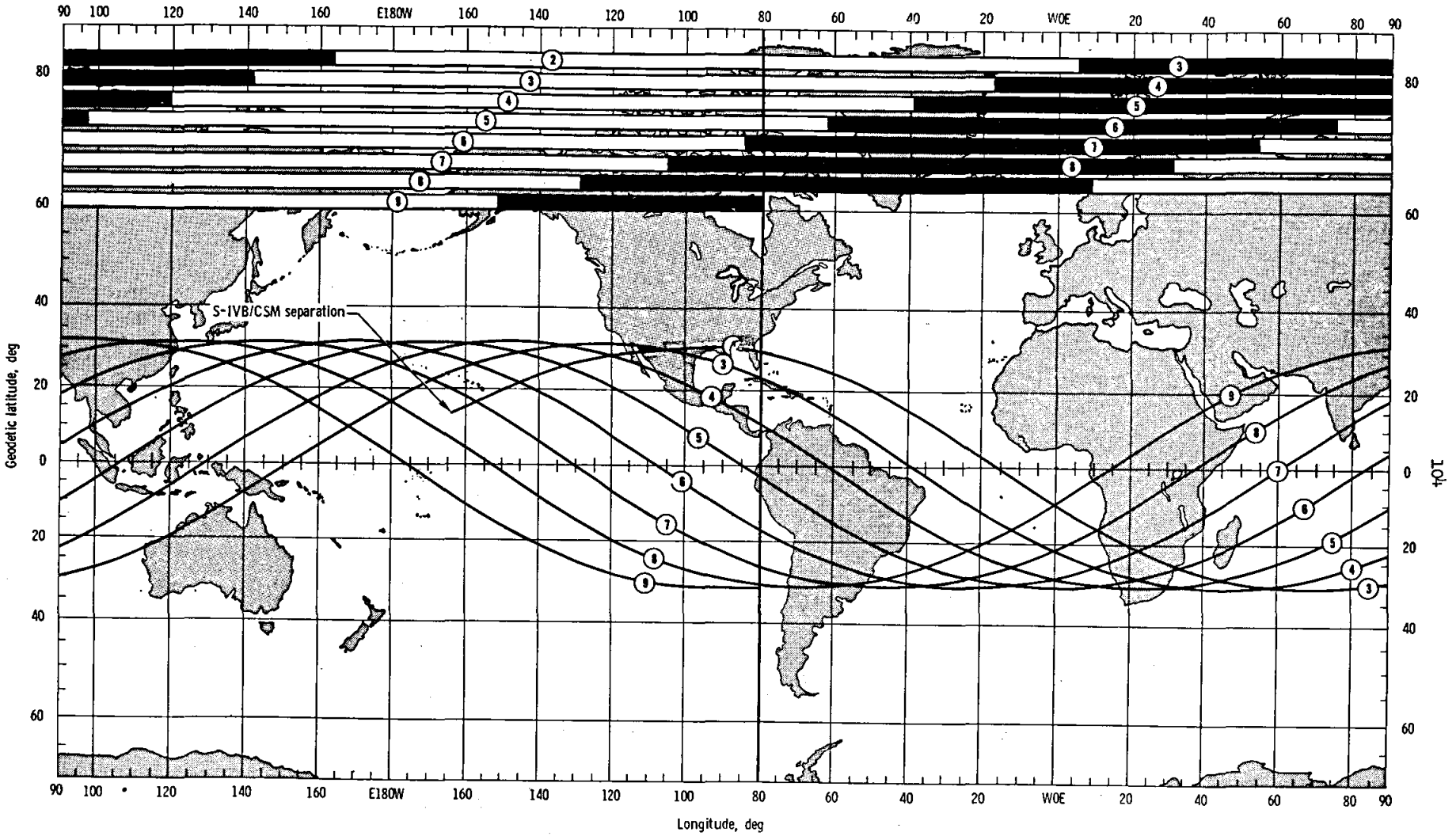
TABLE IX.- SPS DEORBIT MANEUVERS TO THE ETR

(a) Conditions at deorbit

Earth-fixed position	
Altitude, ft	10 430 765
Longitude, deg	-153
Geodetic latitude, deg	11.89
Inertial velocity vector	
Velocity, fps	25262.5
Flight-path angle, deg	-1.04
Azimuth angle, deg	60.61
Spacecraft weight, lb	25 887
Retro attitude, deg	49.3

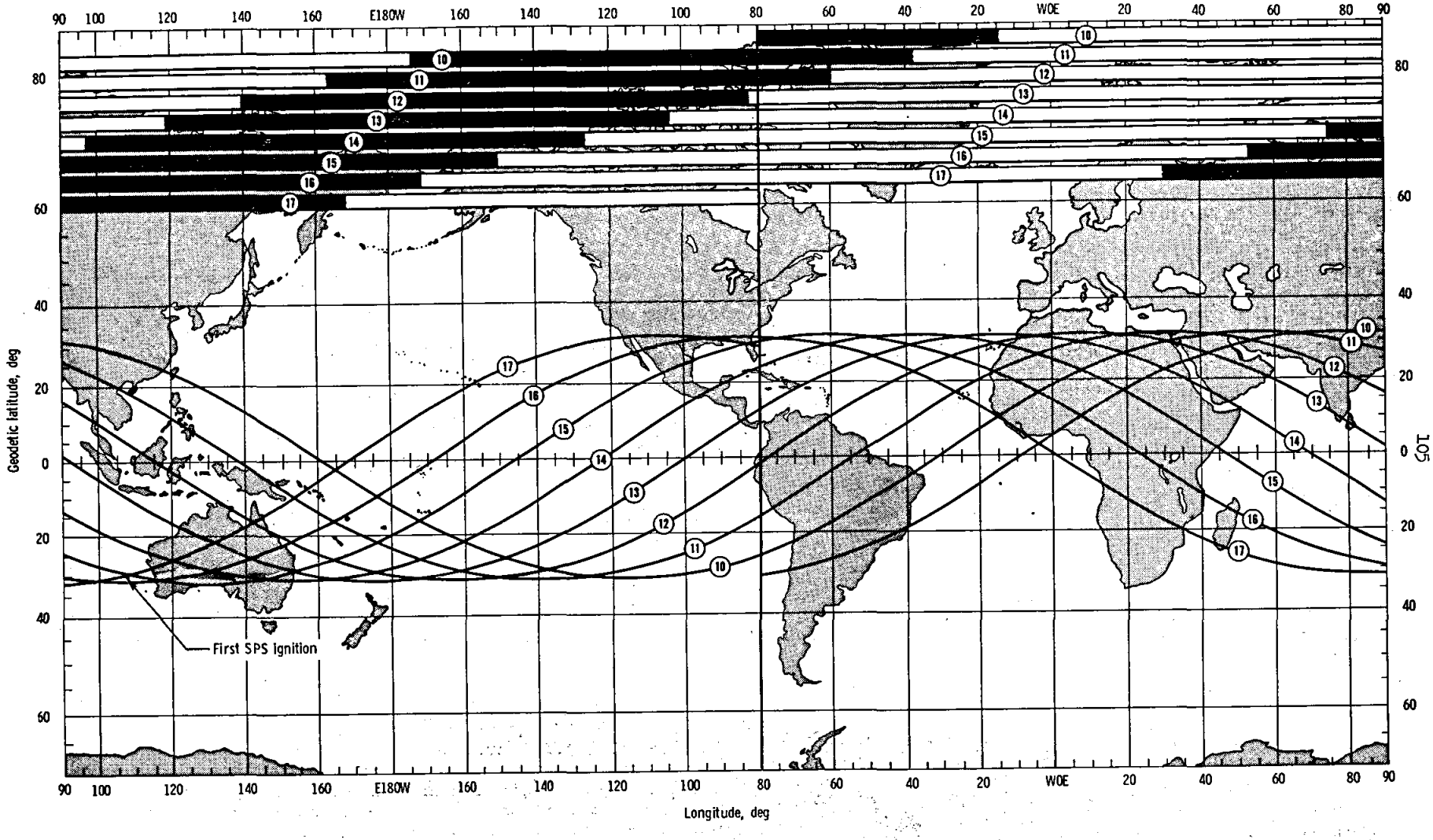
(b) Conditions at reentry (400 000 ft)

Earth-fixed position	
Coast time, sec	826
Longitude, deg	98.83
Geodetic latitude, deg	31.03
Inertial velocity vector	
Velocity, fps	25 850.3
Flight-path angle, deg	-1.759
Azimuth angle, deg	83.64
Target latitude, deg	29.80
Target longitude, deg	-67.0



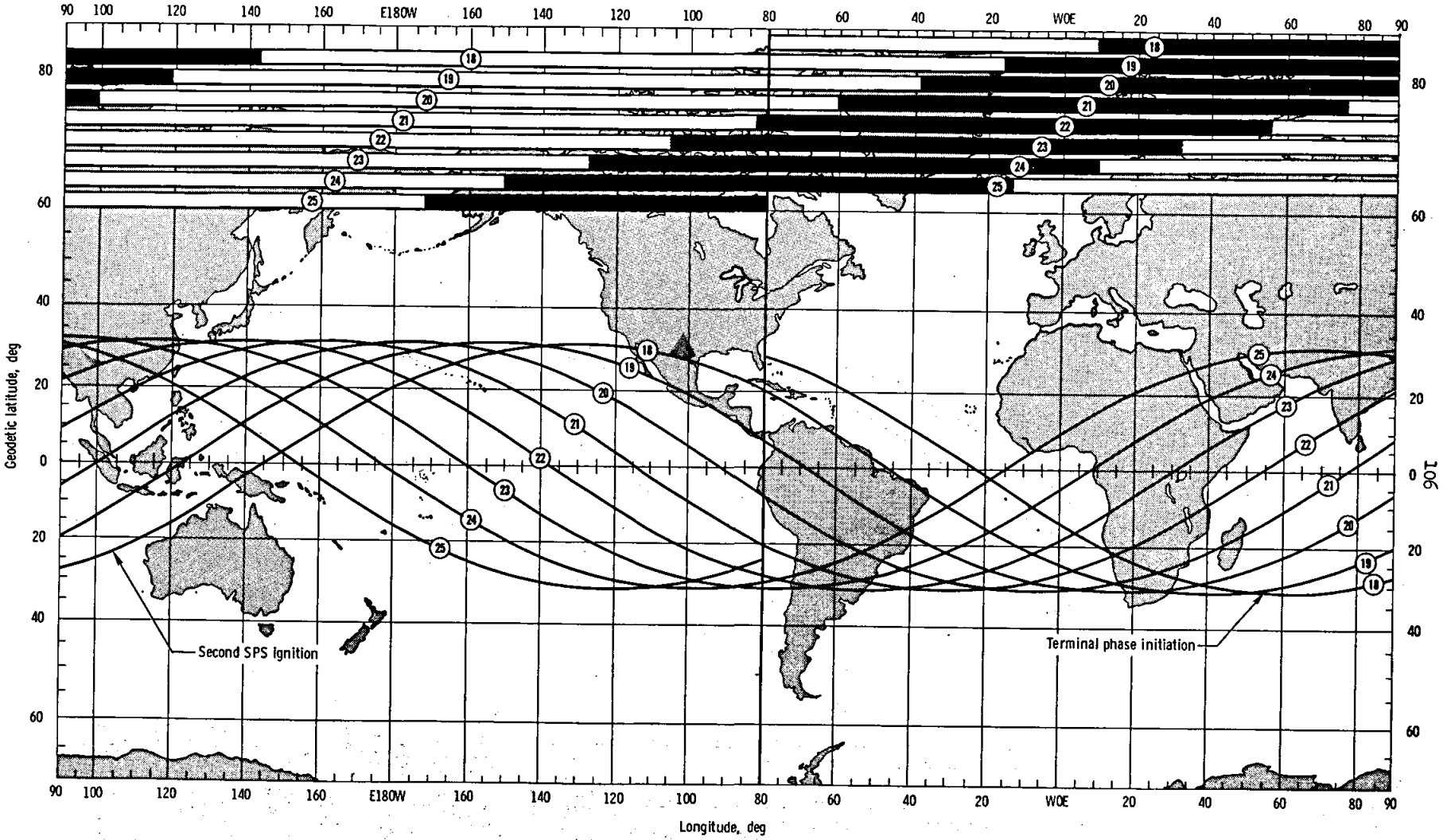
(a) Revolution 2 - 9.

Figure 1.- Groundtracks, daylight/darkness and major mission events for Apollo 7.



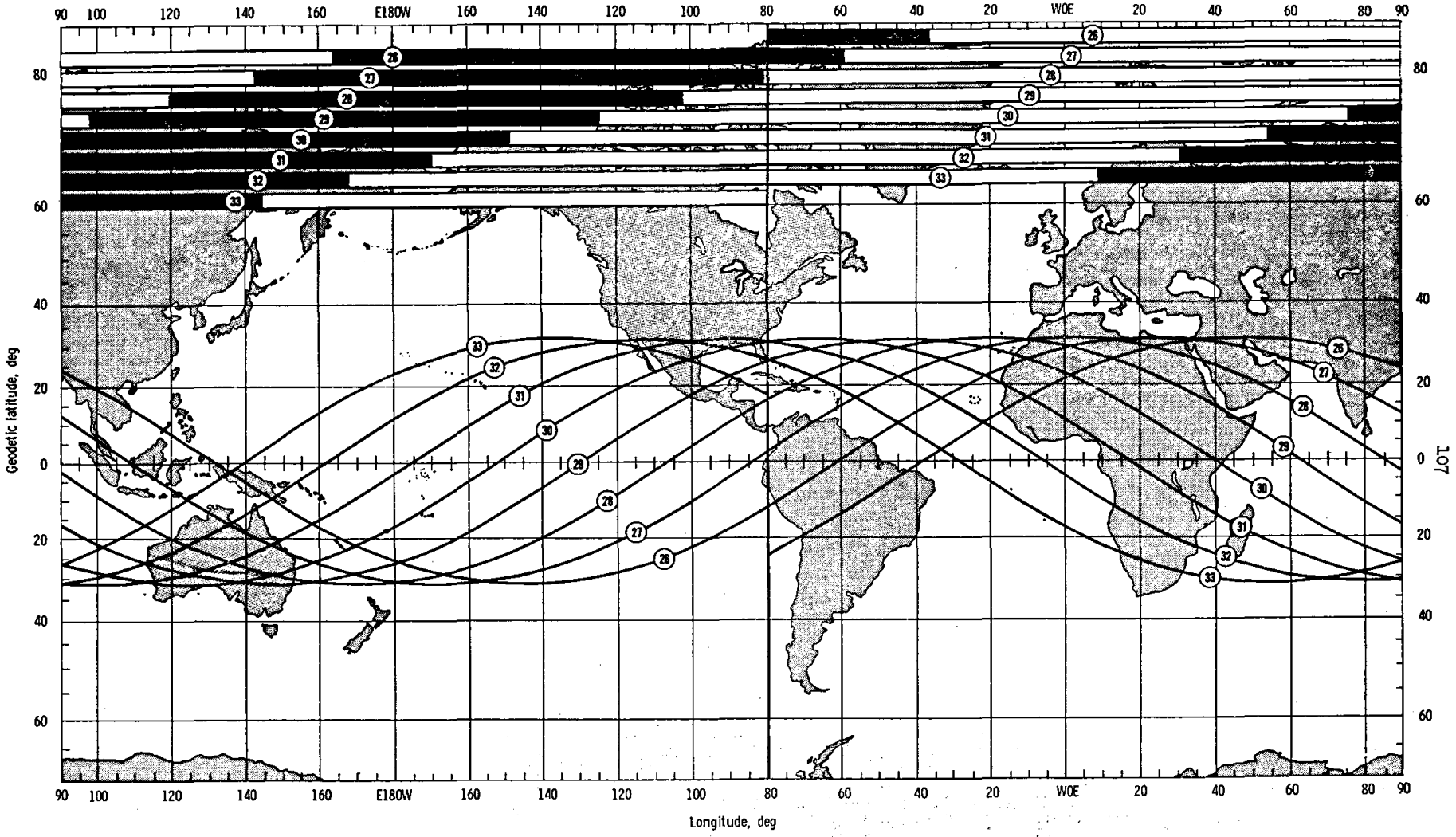
(b) Revolution 10 - 17.

Figure 1. - Continued.



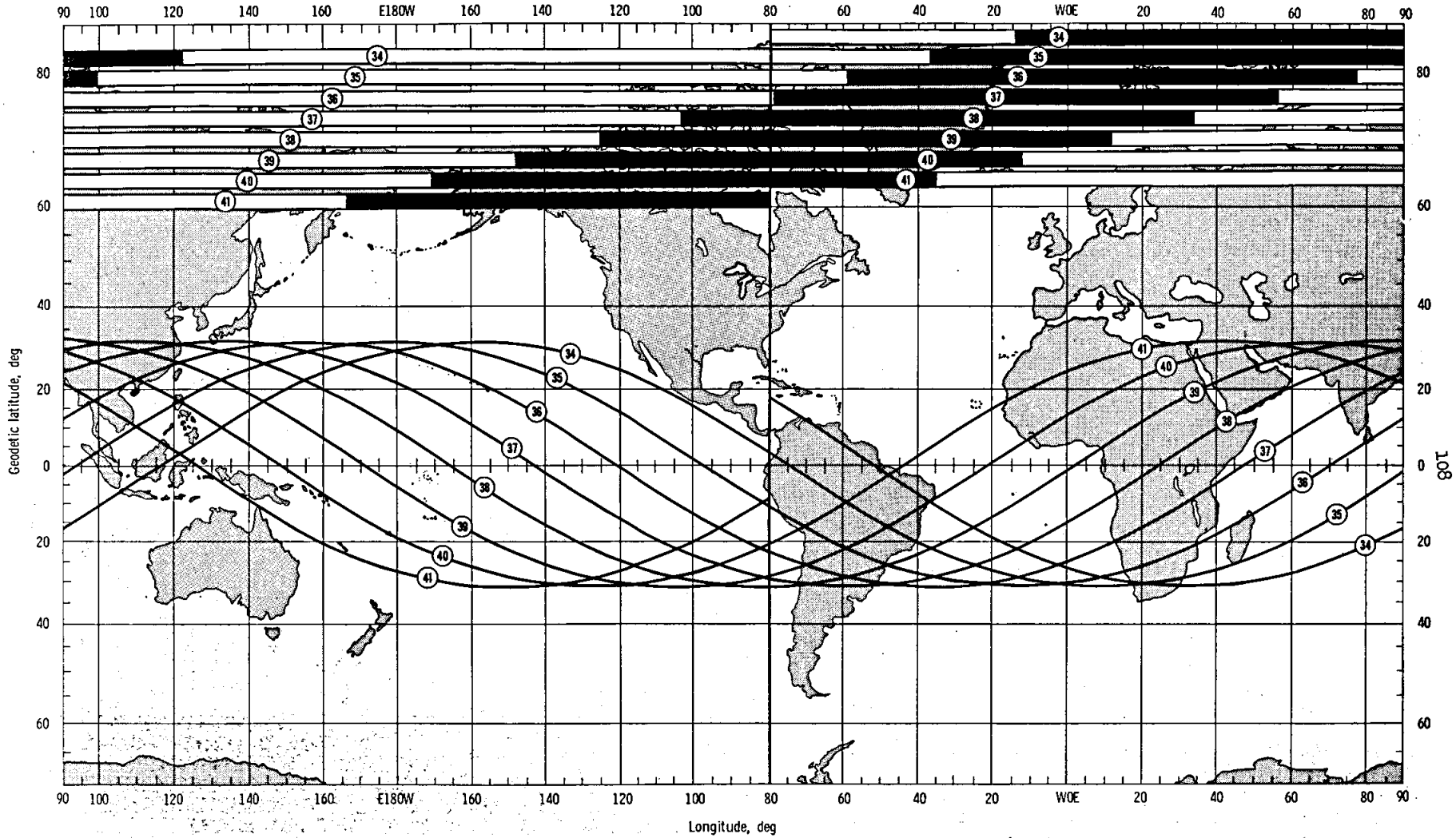
(c) Revolution 18 - 25.

Figure 1. - Continued.



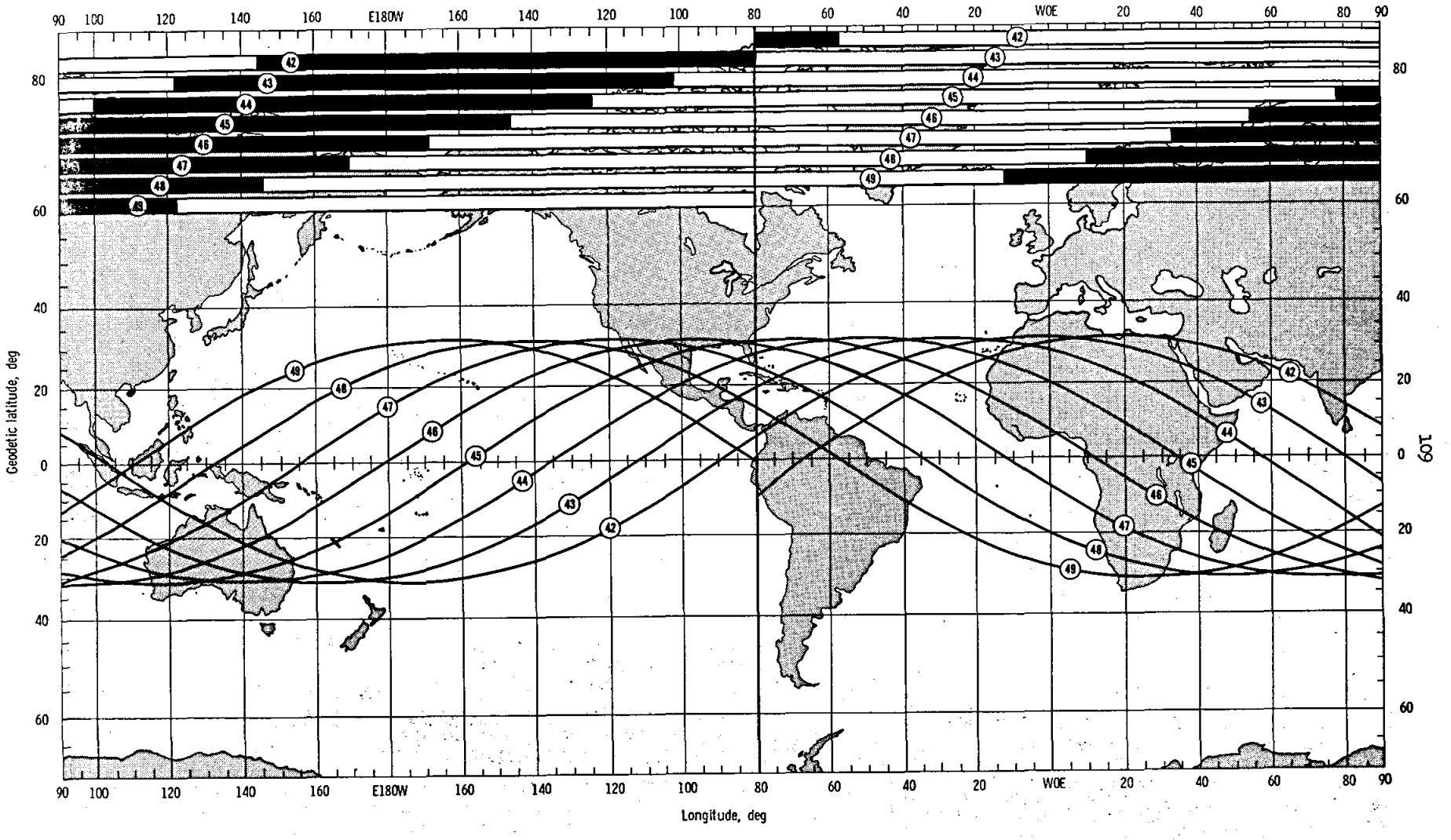
(d) Revolution 26 - 33.

Figure 1.- Continued.



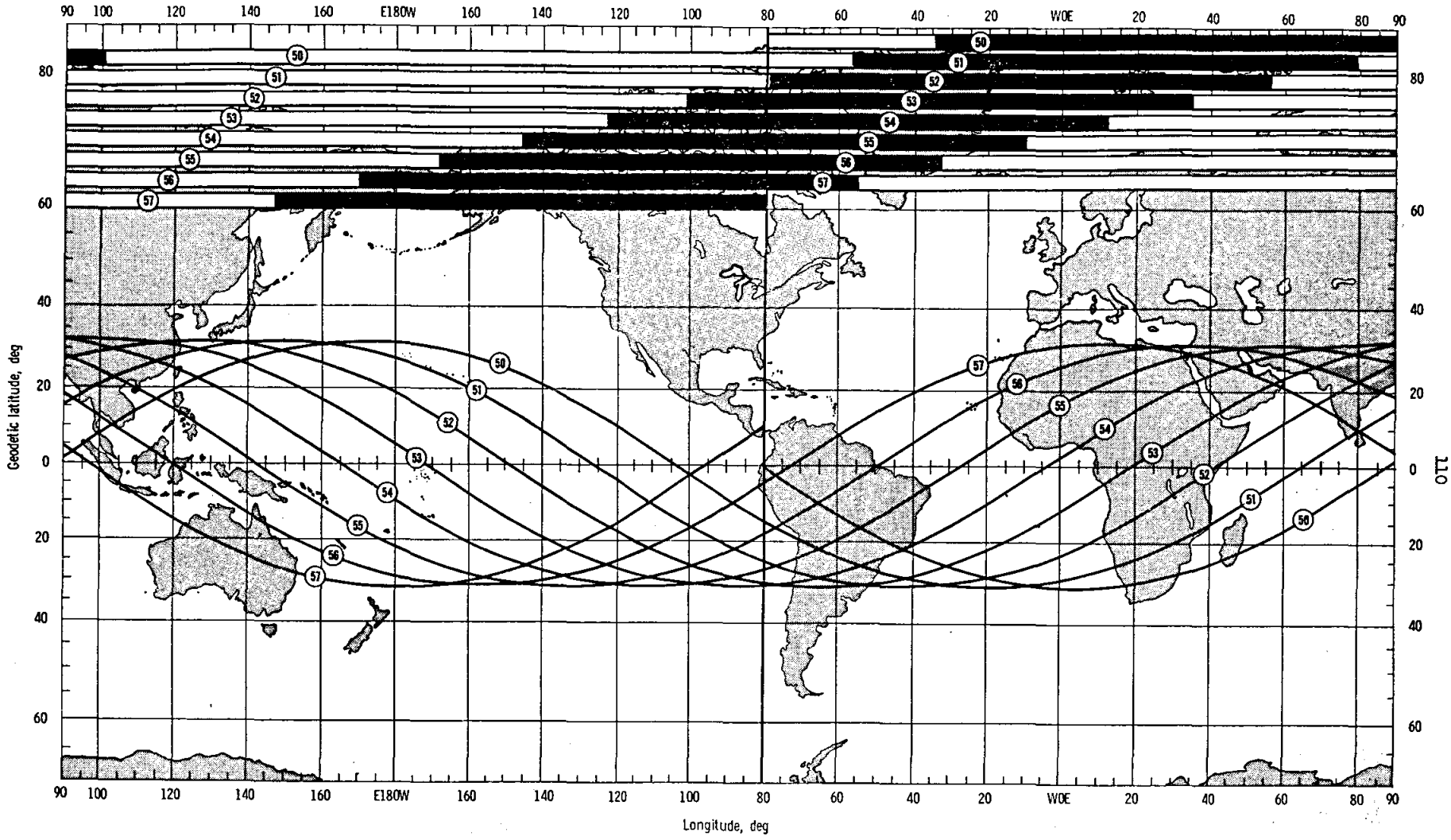
(e) Revolution 34 - 41.

Figure 1.- Continued.



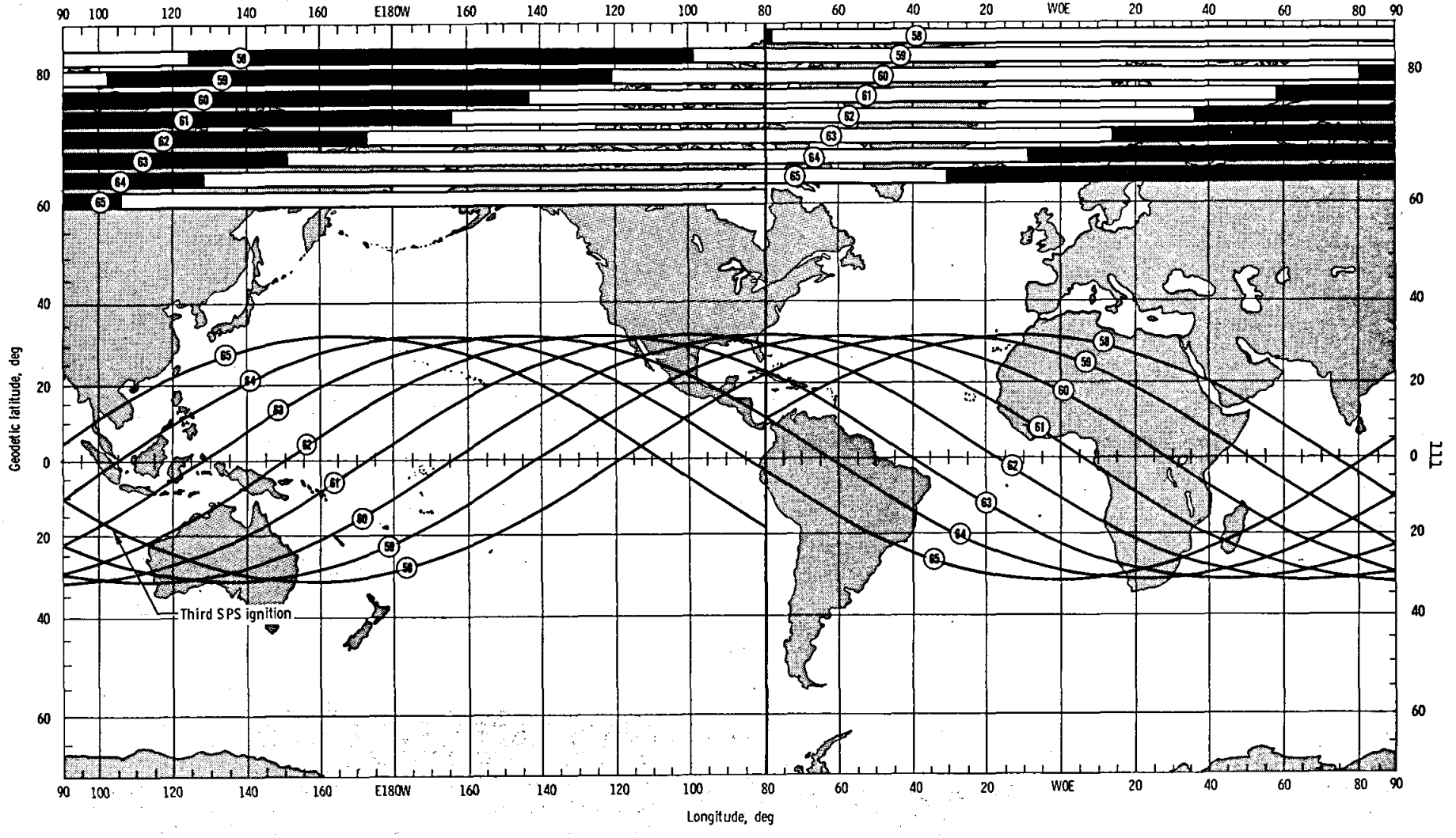
(f) Revolution 42 - 49.

Figure 1.- Continued.



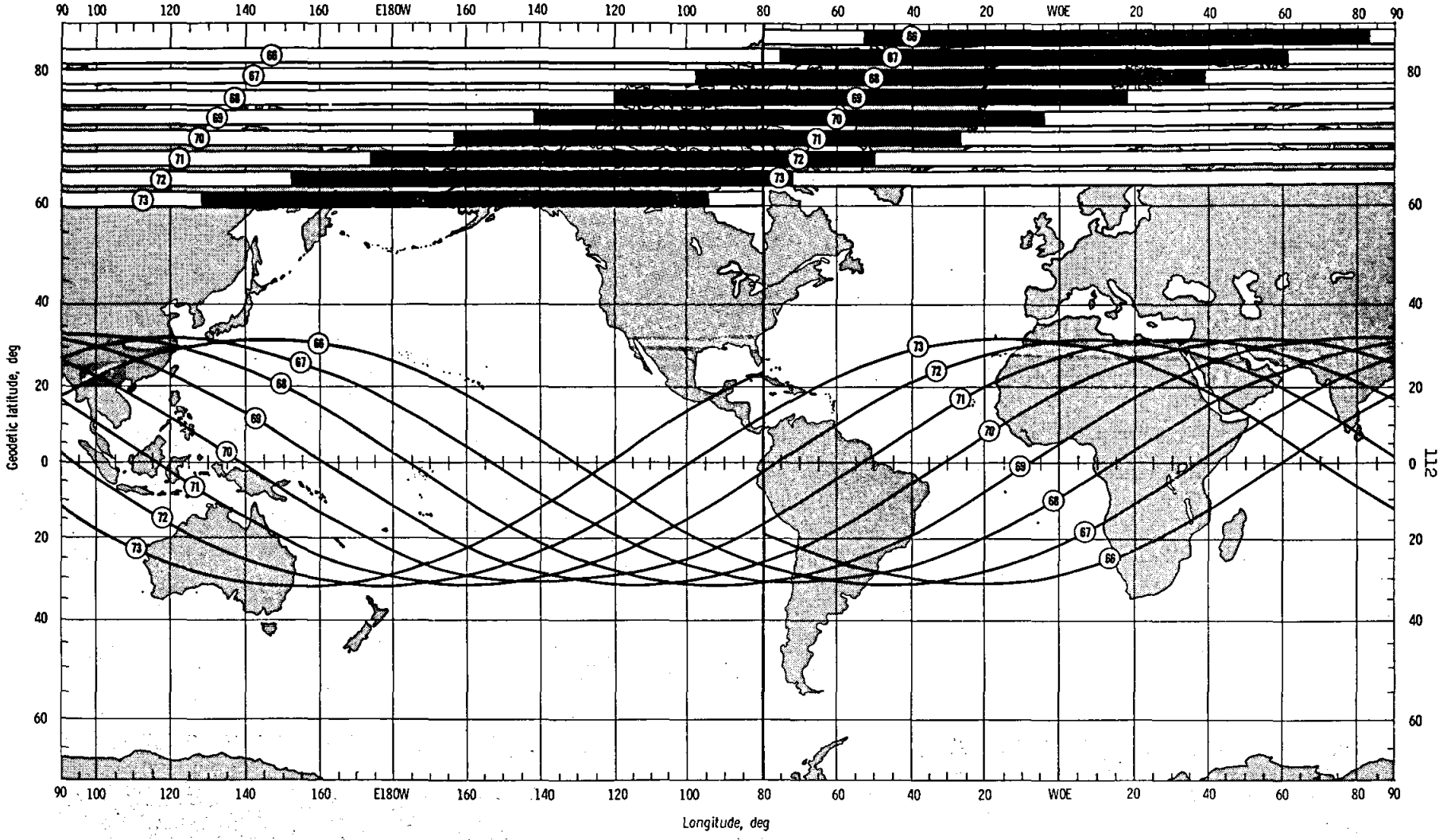
(g) Revolution 50 - 57.

Figure 1.- Continued.



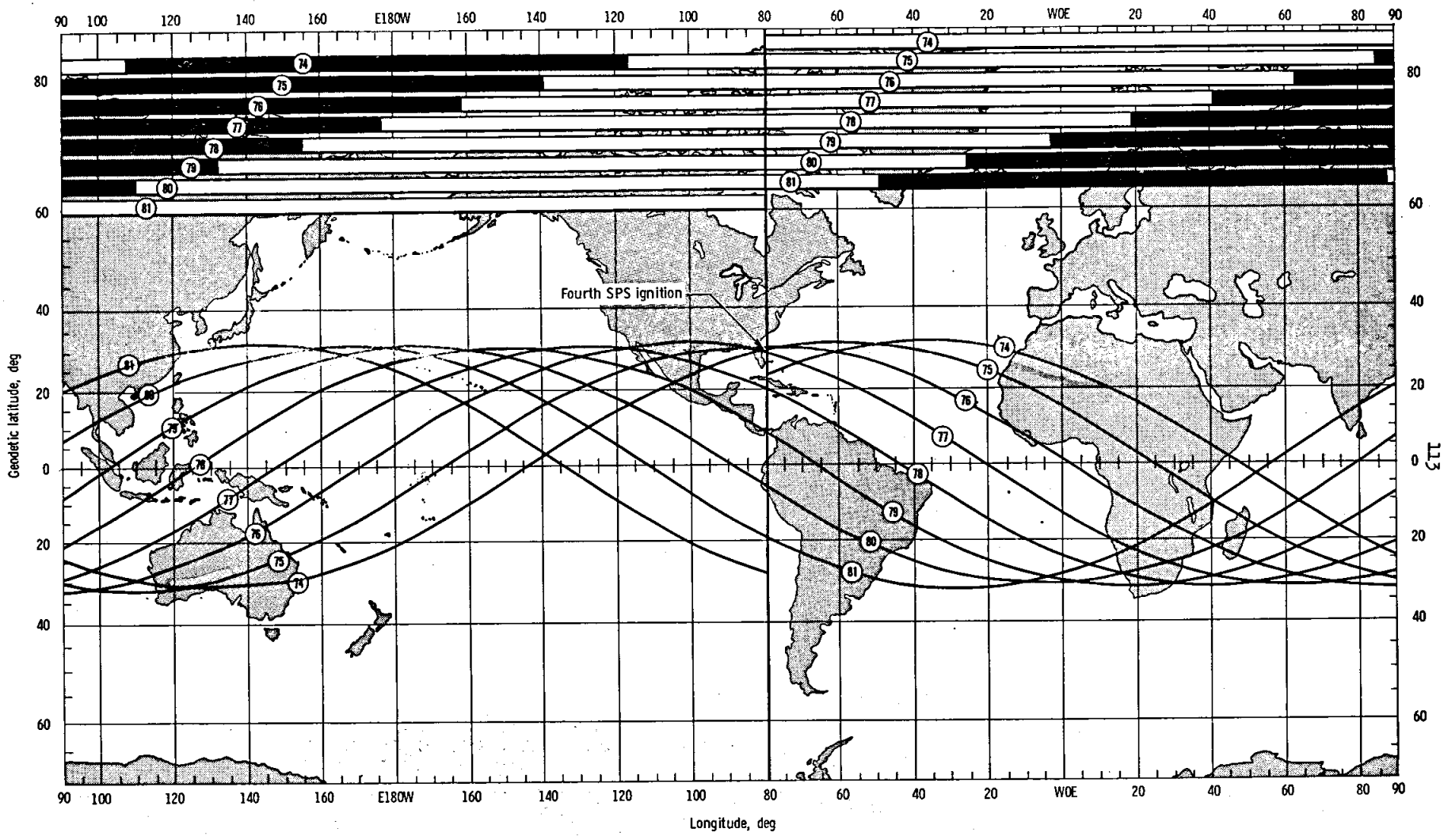
(h) Revolution 58 - 65.

Figure 1. - Continued.



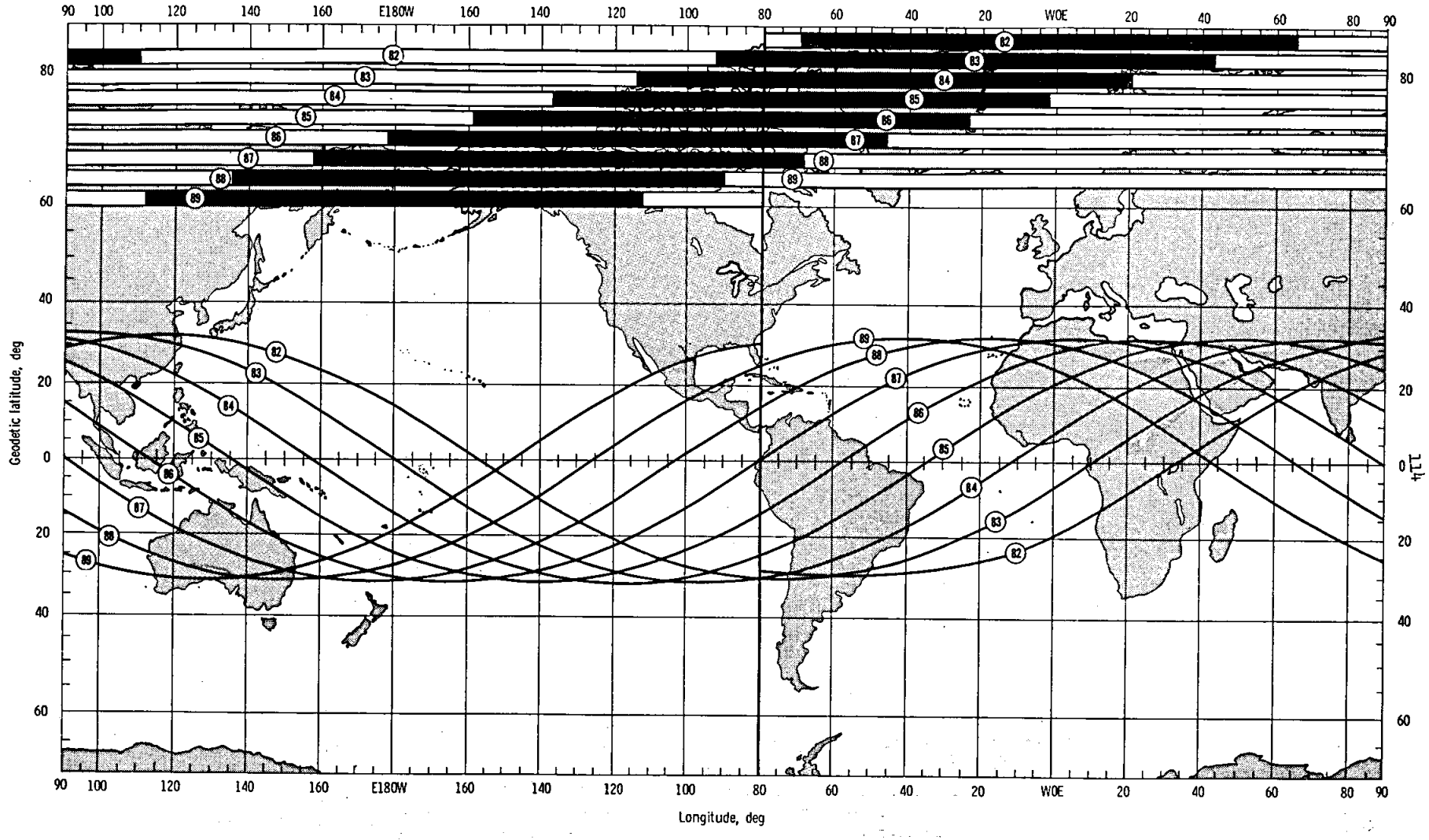
(i) Revolution 66 - 73.

Figure 1. - Continued.



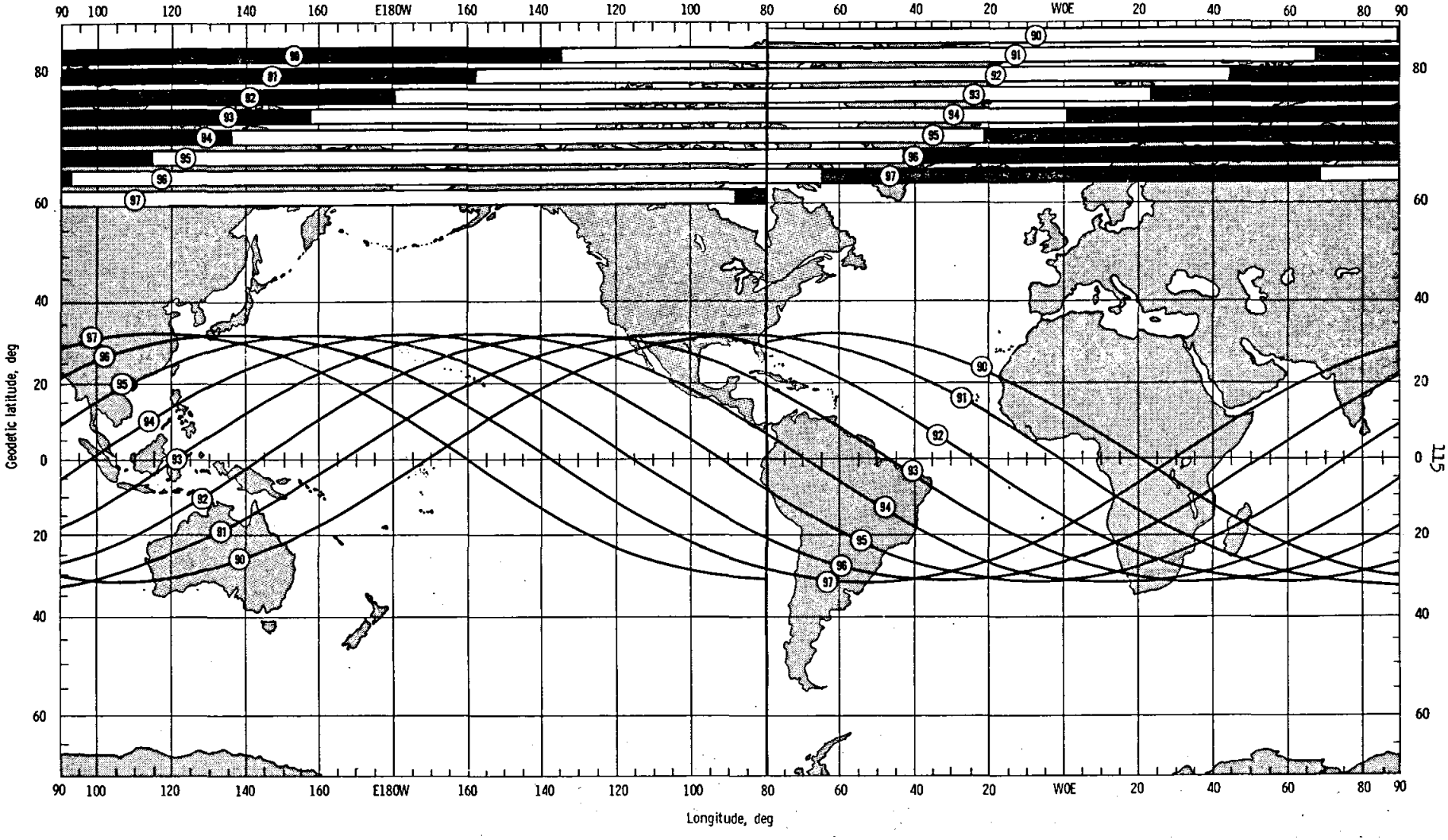
(j) Revolution 74 - 81.

Figure 1. - Continued.



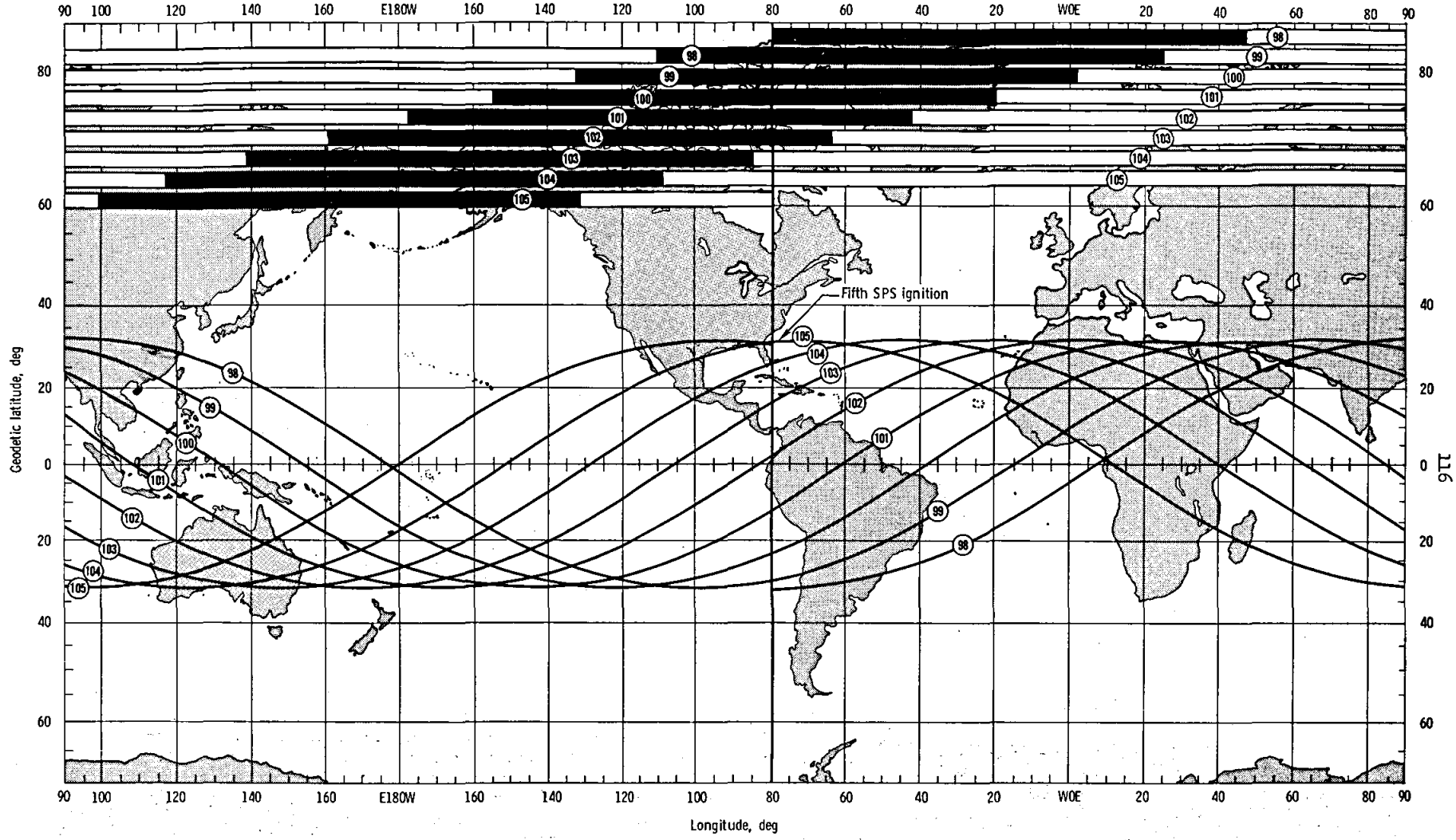
(k) Revolution 82 - 89.

Figure 1. - Continued.



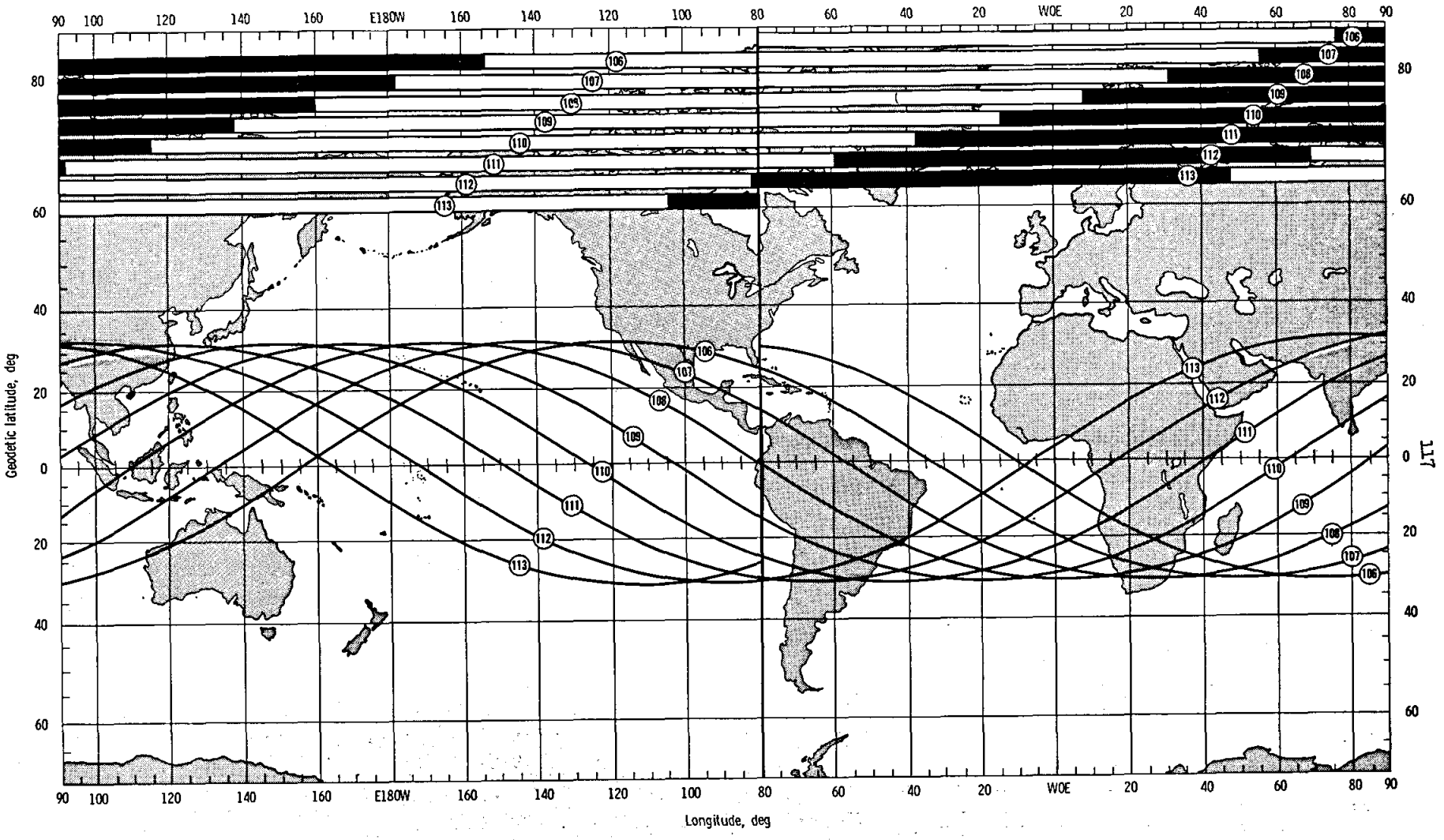
(l) Revolution 90 - 97.

Figure 1. - Continued.



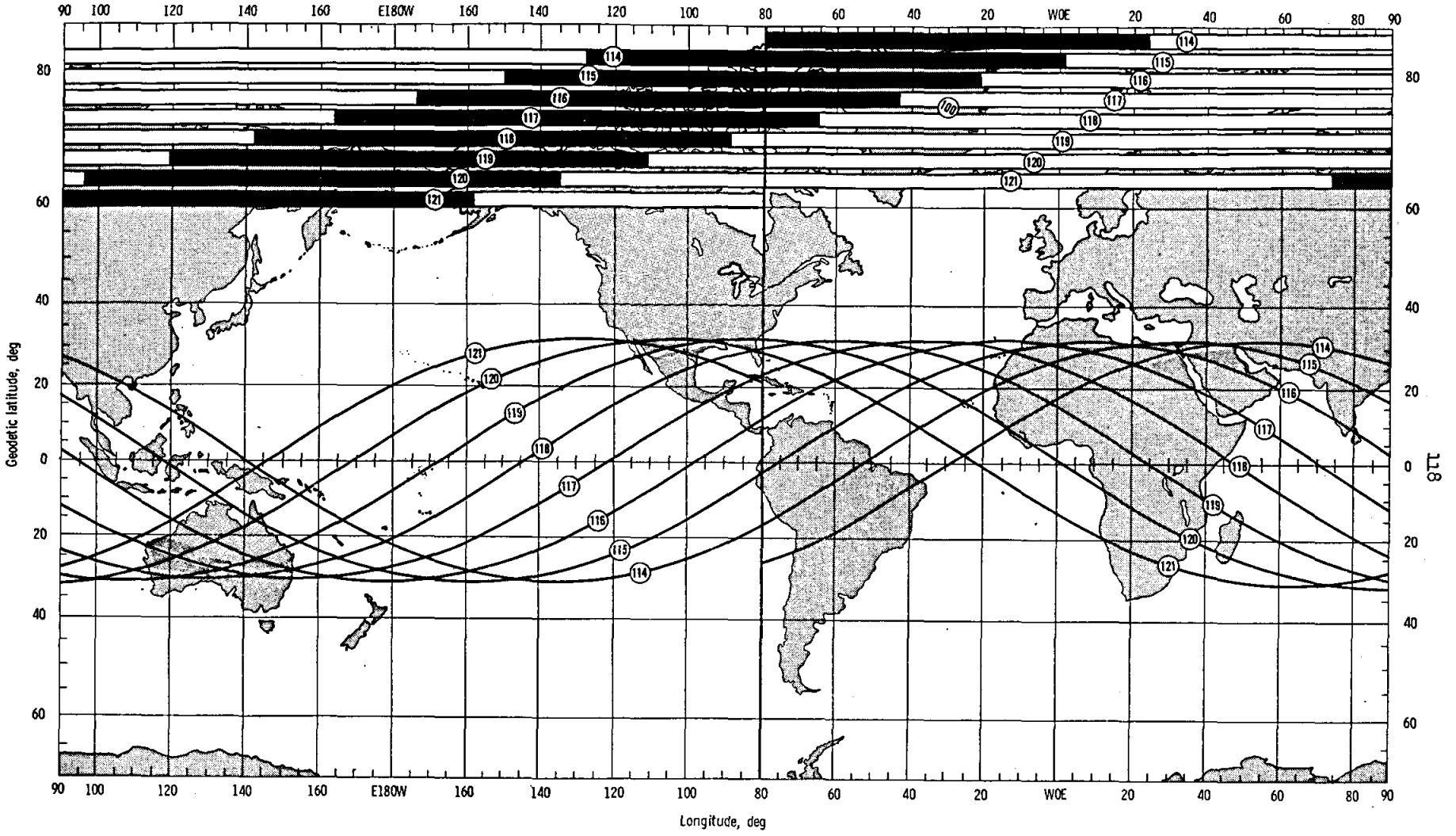
(m) Revolution 98 - 105.

Figure 1. - Continued.



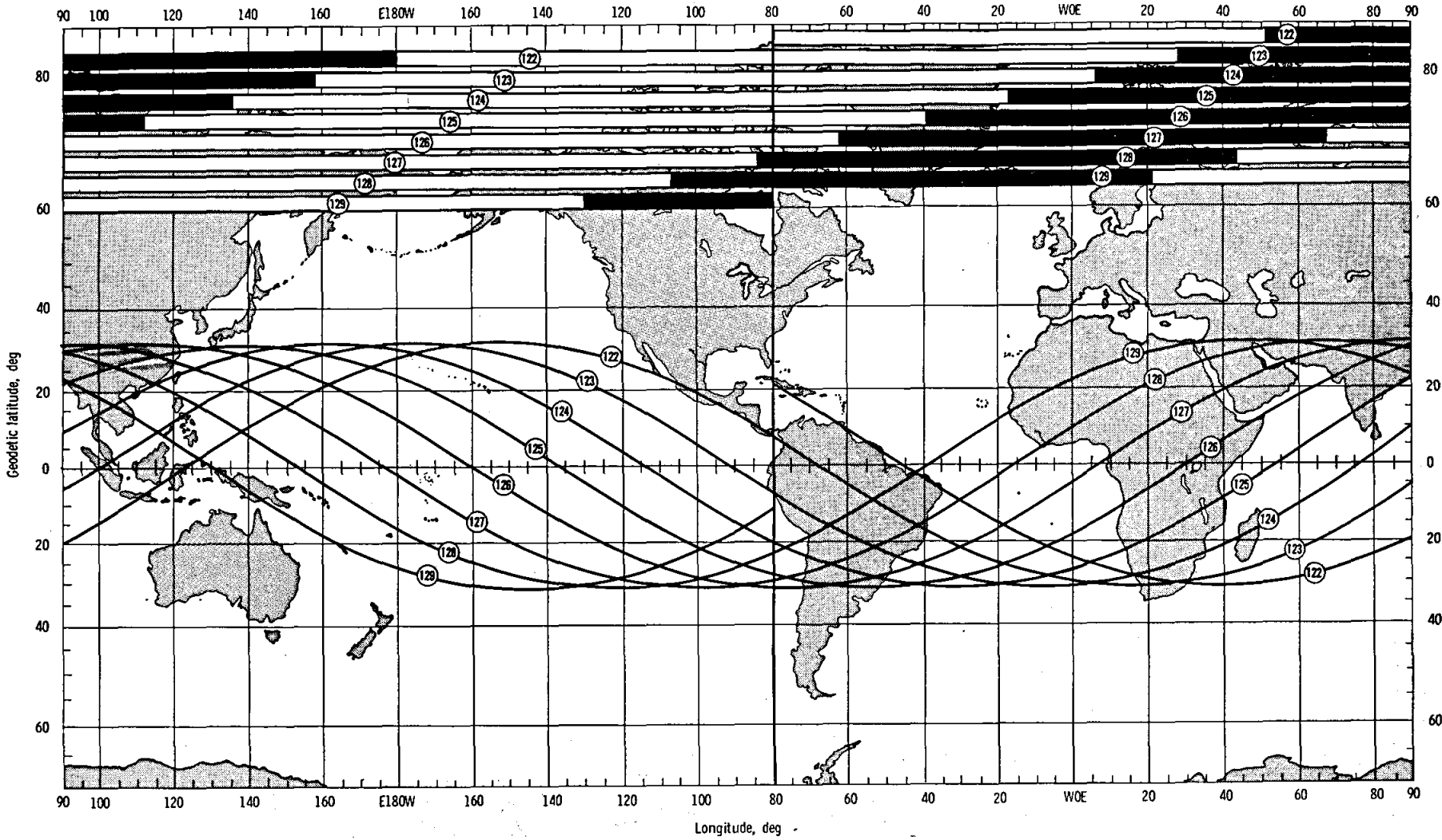
(n) Revolution 106 - 113.

Figure 1. - Continued.



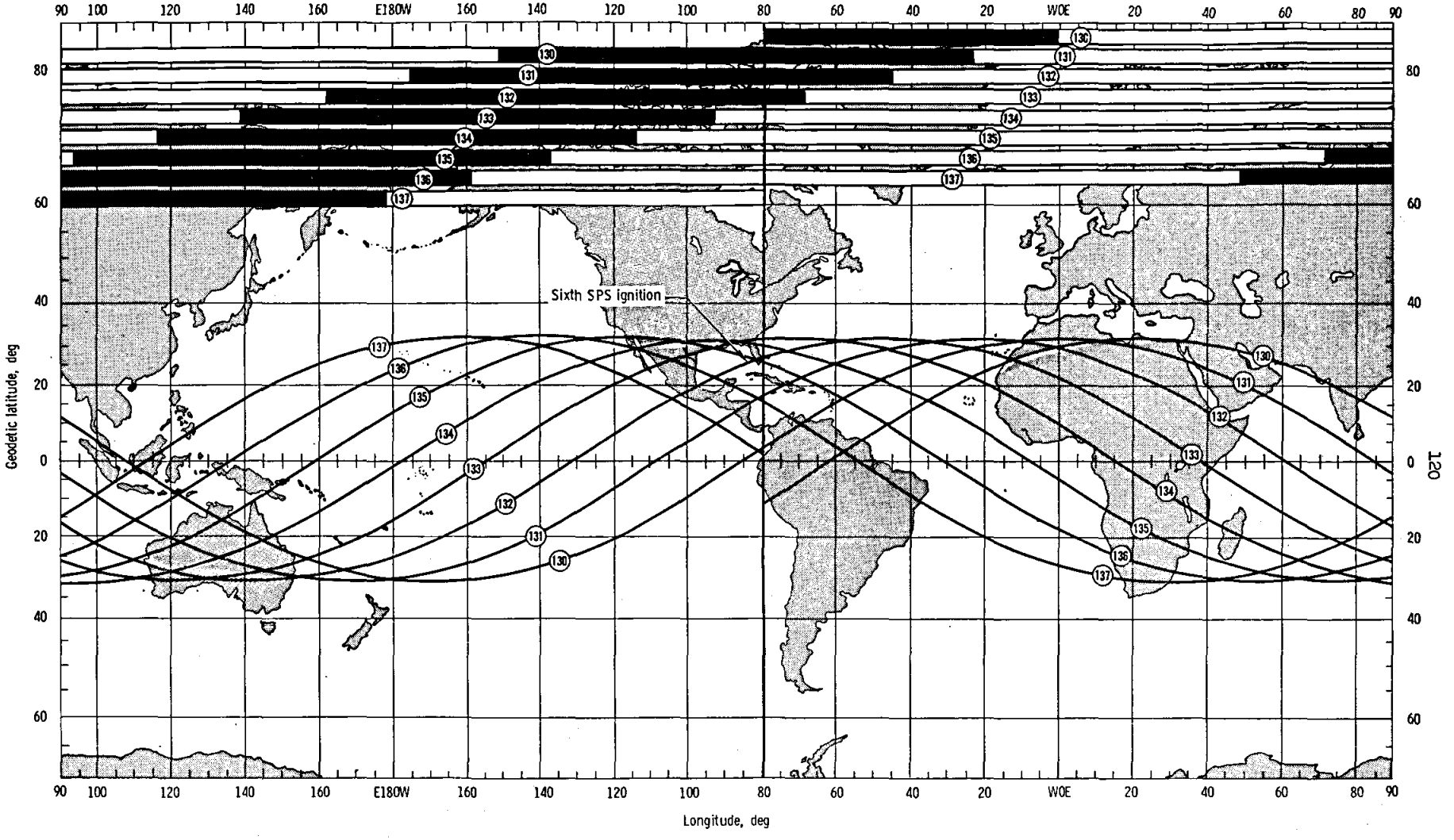
(o) Revolution 114 - 121.

Figure 1. - Continued.



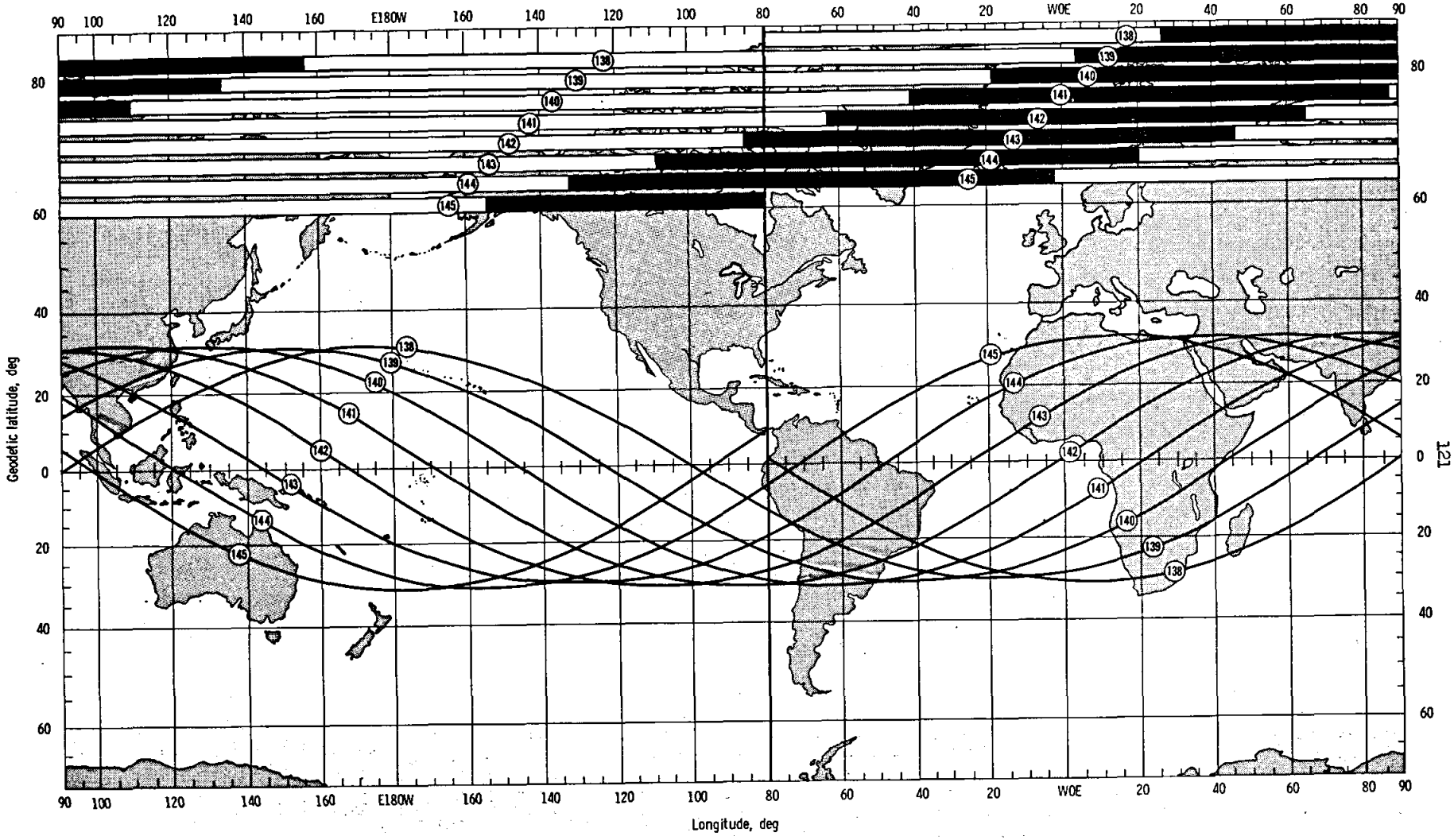
(p) Revolution 122 - 129.

Figure 1. - Continued.



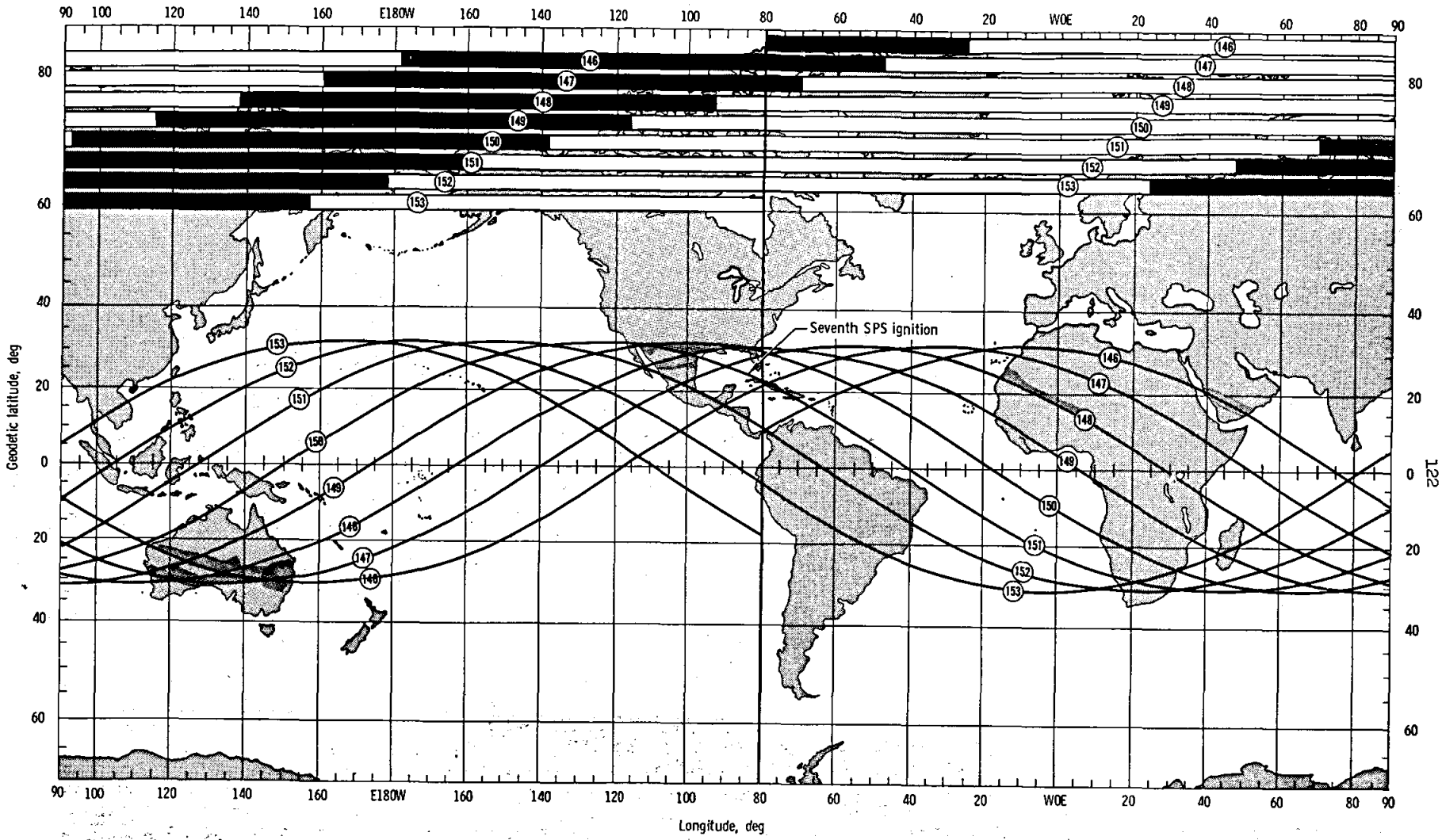
(q) Revolution 130 - 137.

Figure 1. - Continued.



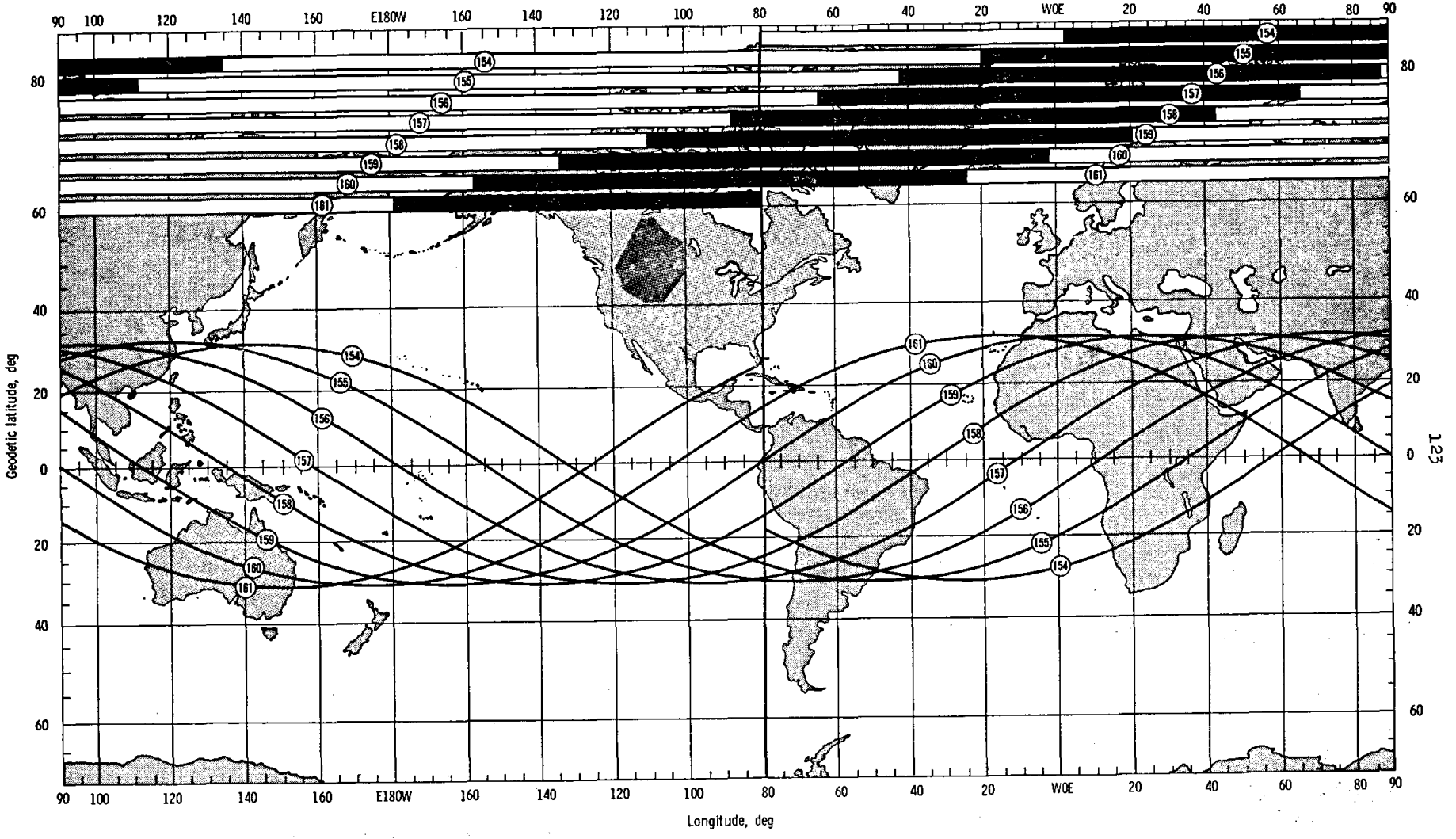
(r) Revolution 138 - 145.

Figure 1. - Continued.



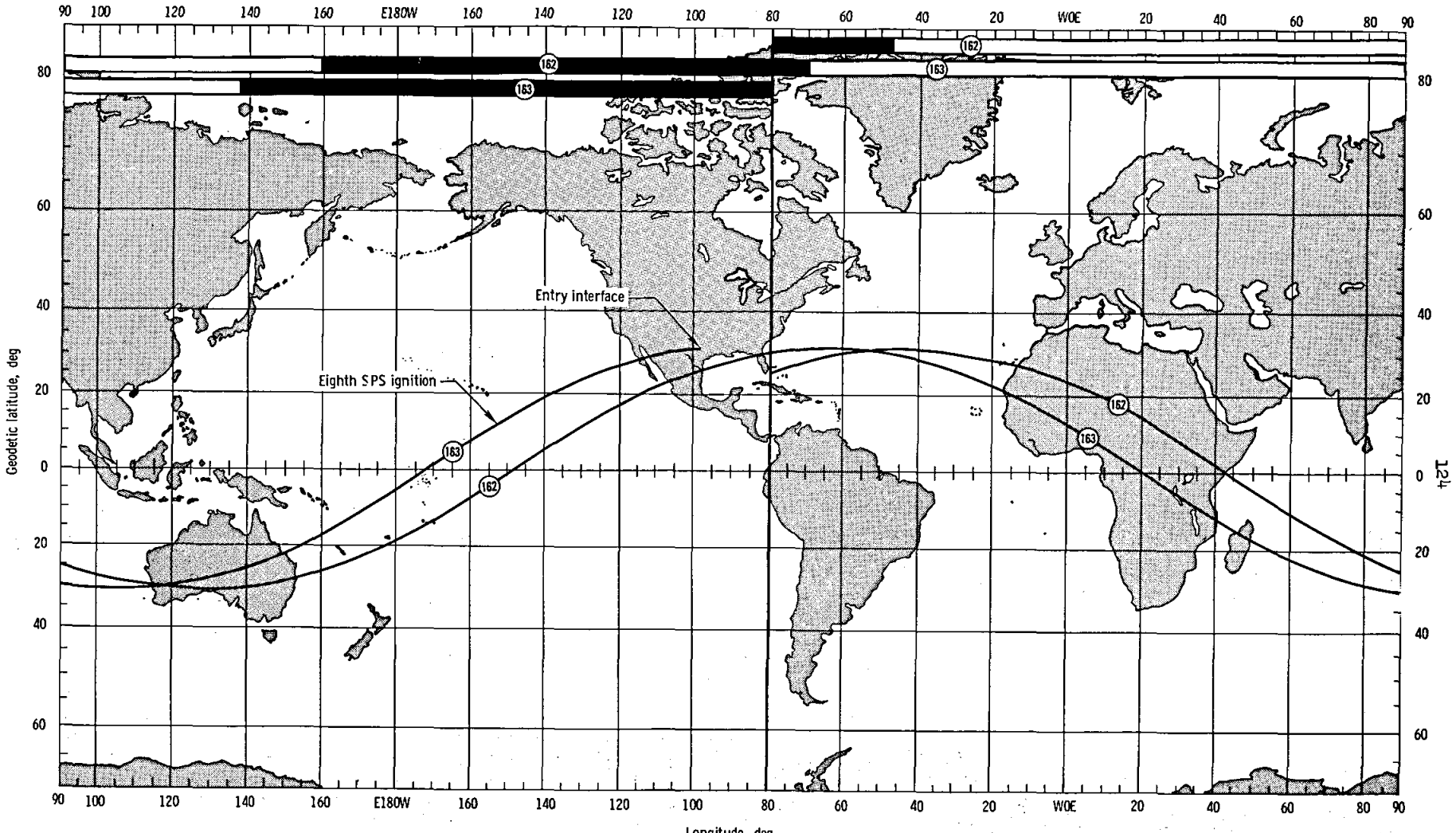
(s) Revolution 146 - 153.

Figure 1. - Continued.



(t) Revolution 154 - 161.

Figure 1. - Continued.



(u) Revolution 162 - 163.

Figure 1. - Concluded.

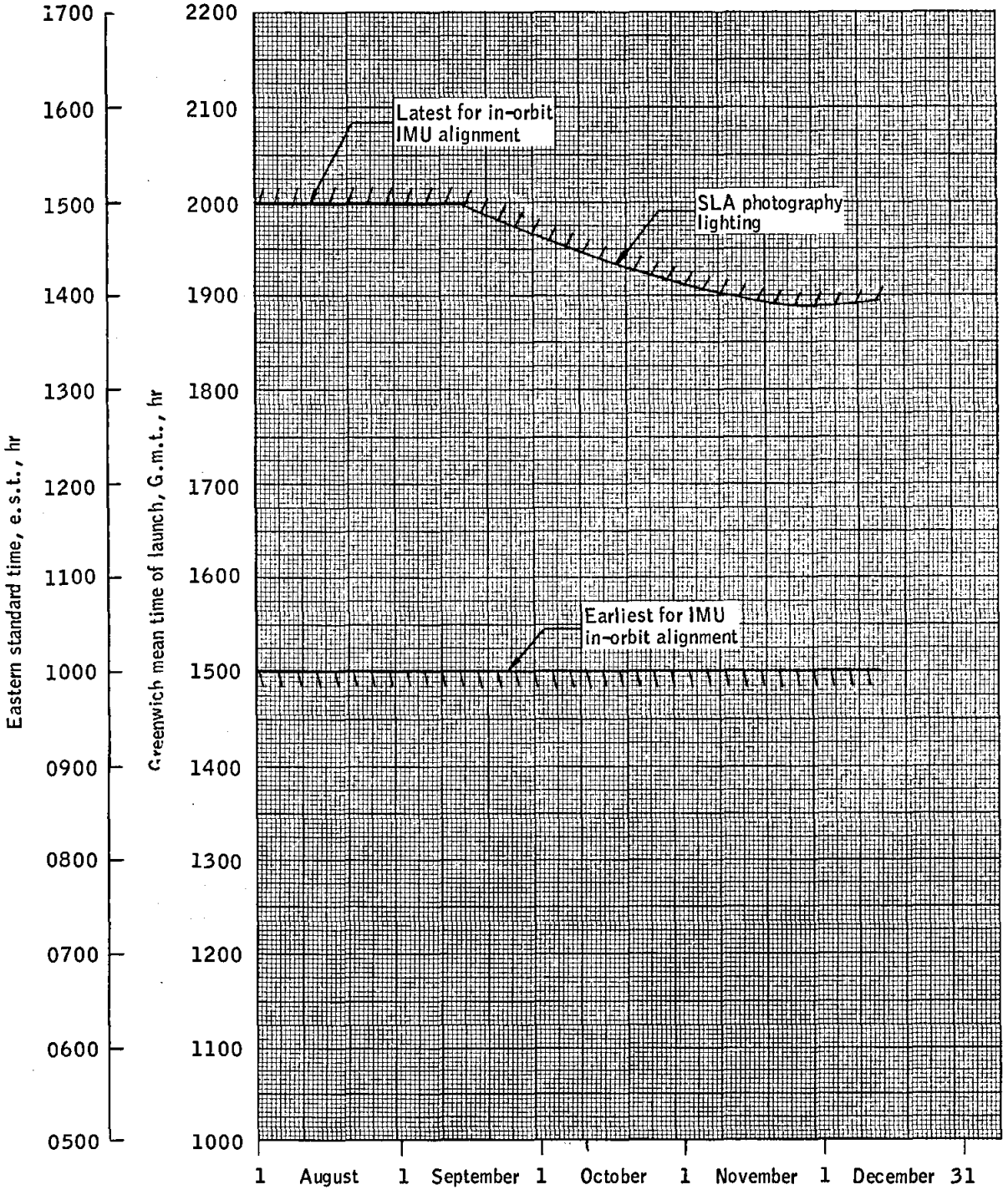


Figure 2.- Launch window.

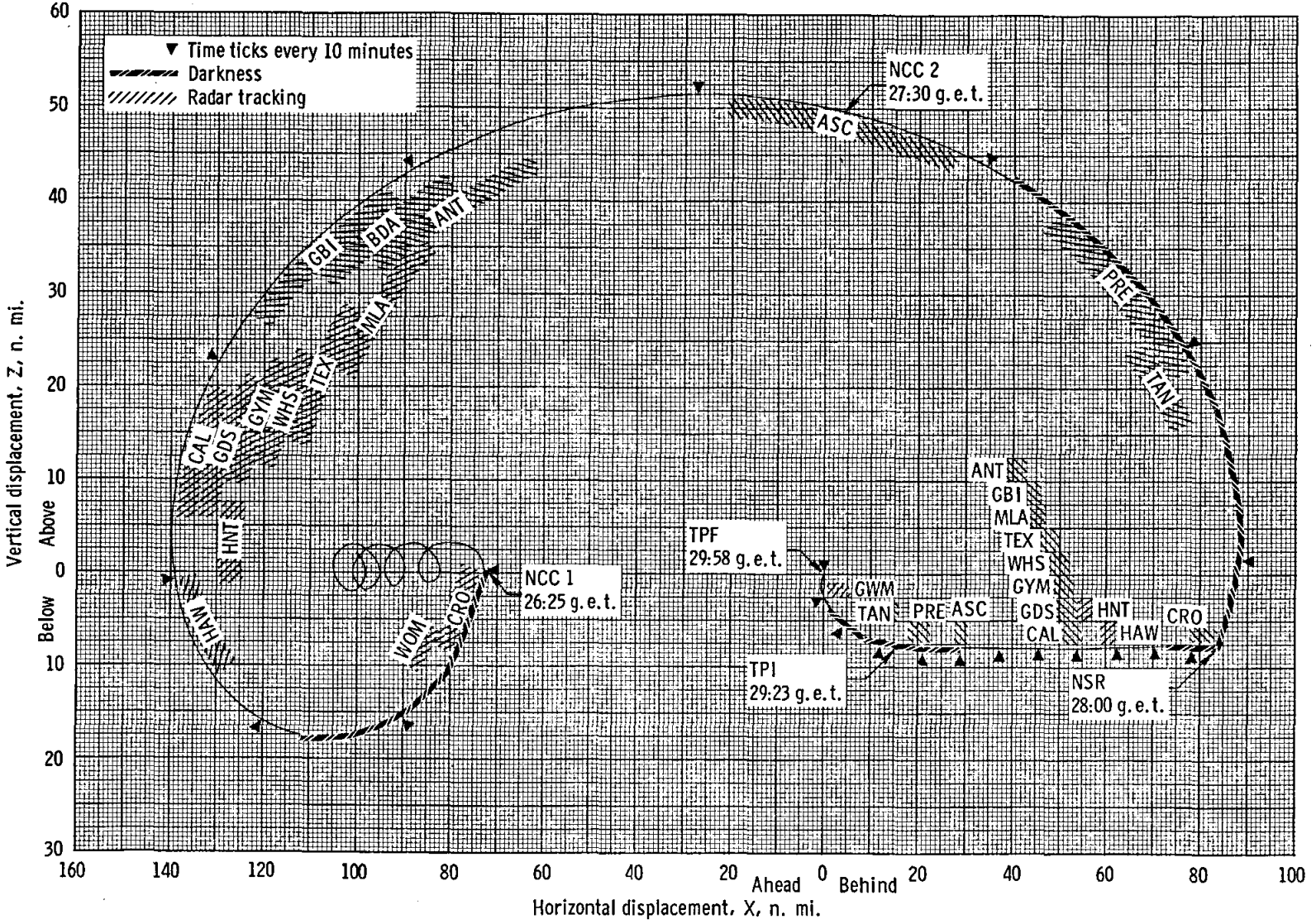


Figure 3. - Relative trajectory of the CSM with respect to the S-IVB for AS-205/101 from 20 hours ground elapsed time to rendezvous.

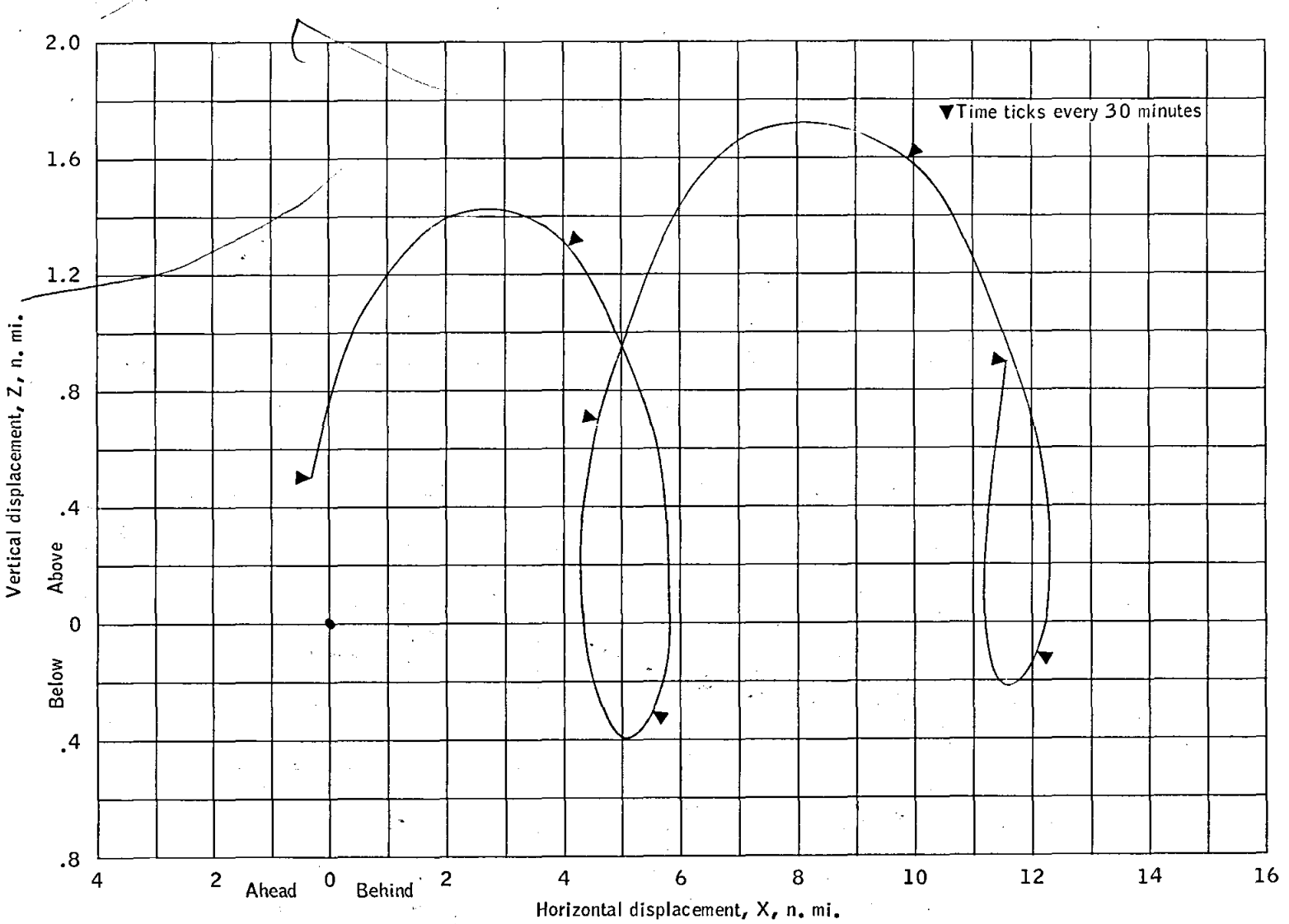


Figure 4.- Relative motion of CSM with respect to S-IVB after separation maneuver following rendezvous.

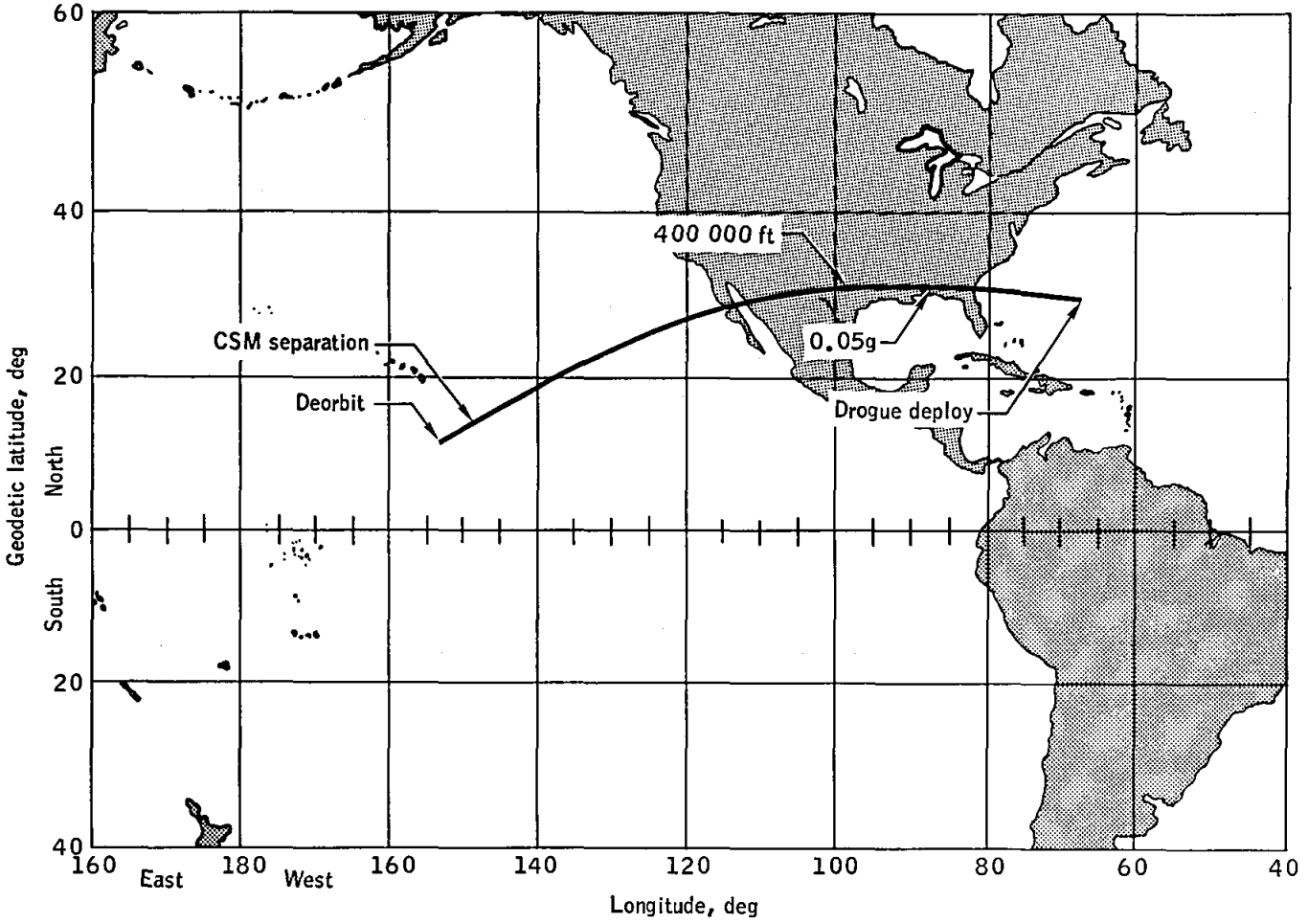


Figure 5.- Entry groundtrack for deorbit maneuvers.

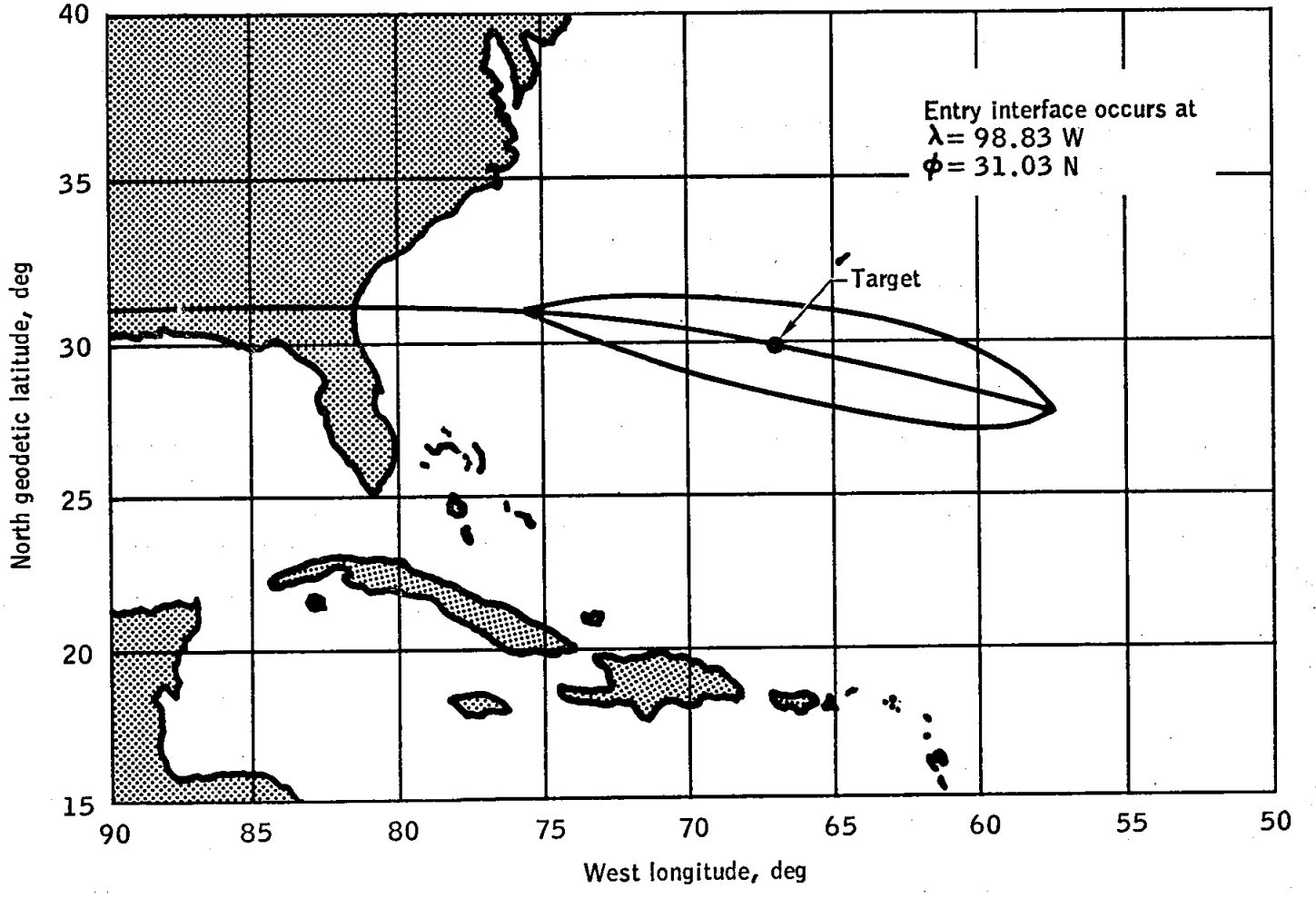


Figure 6.- CM maneuver envelope from an SPS deorbit.

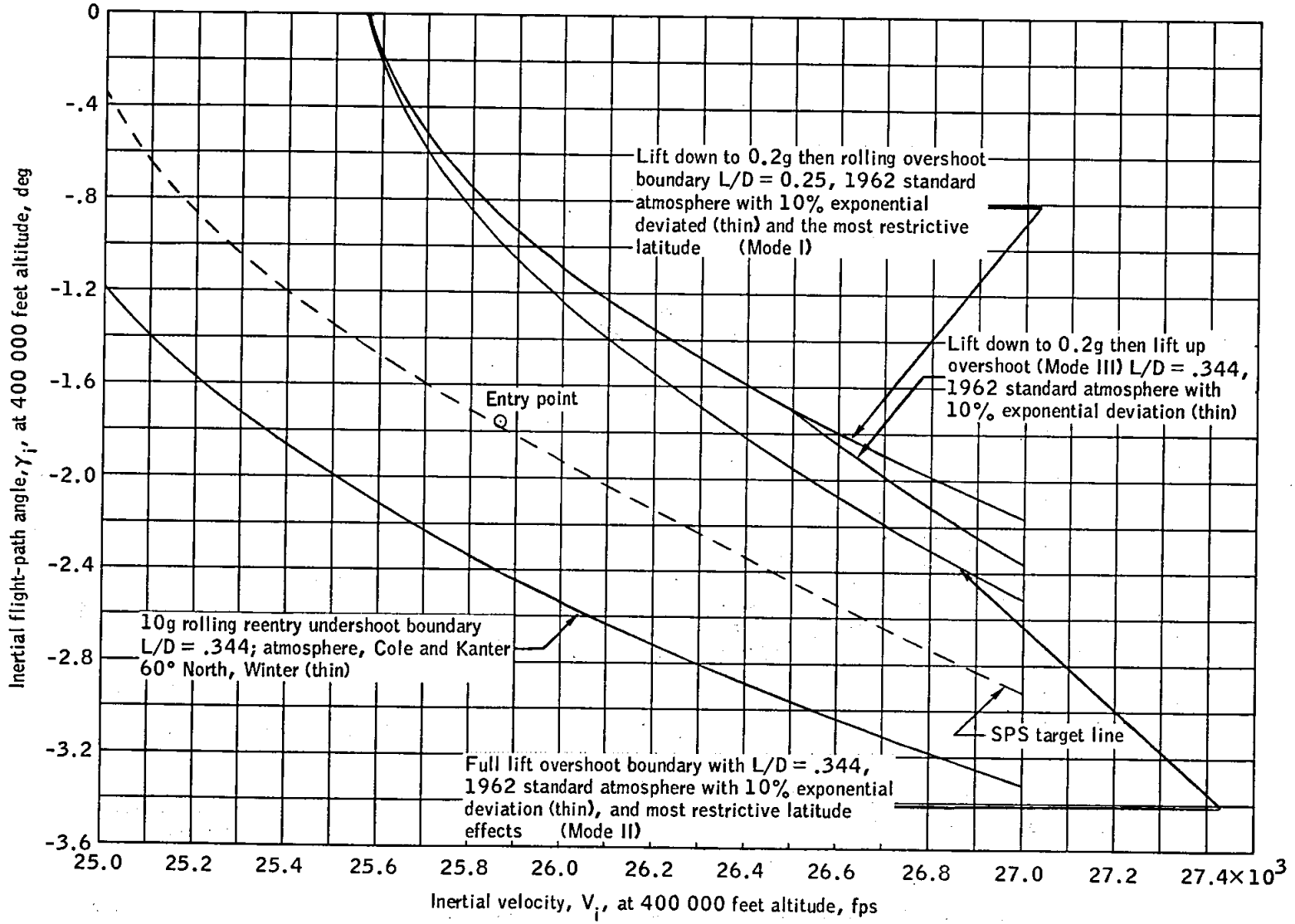


Figure 7.- Low-speed reentry corridor.

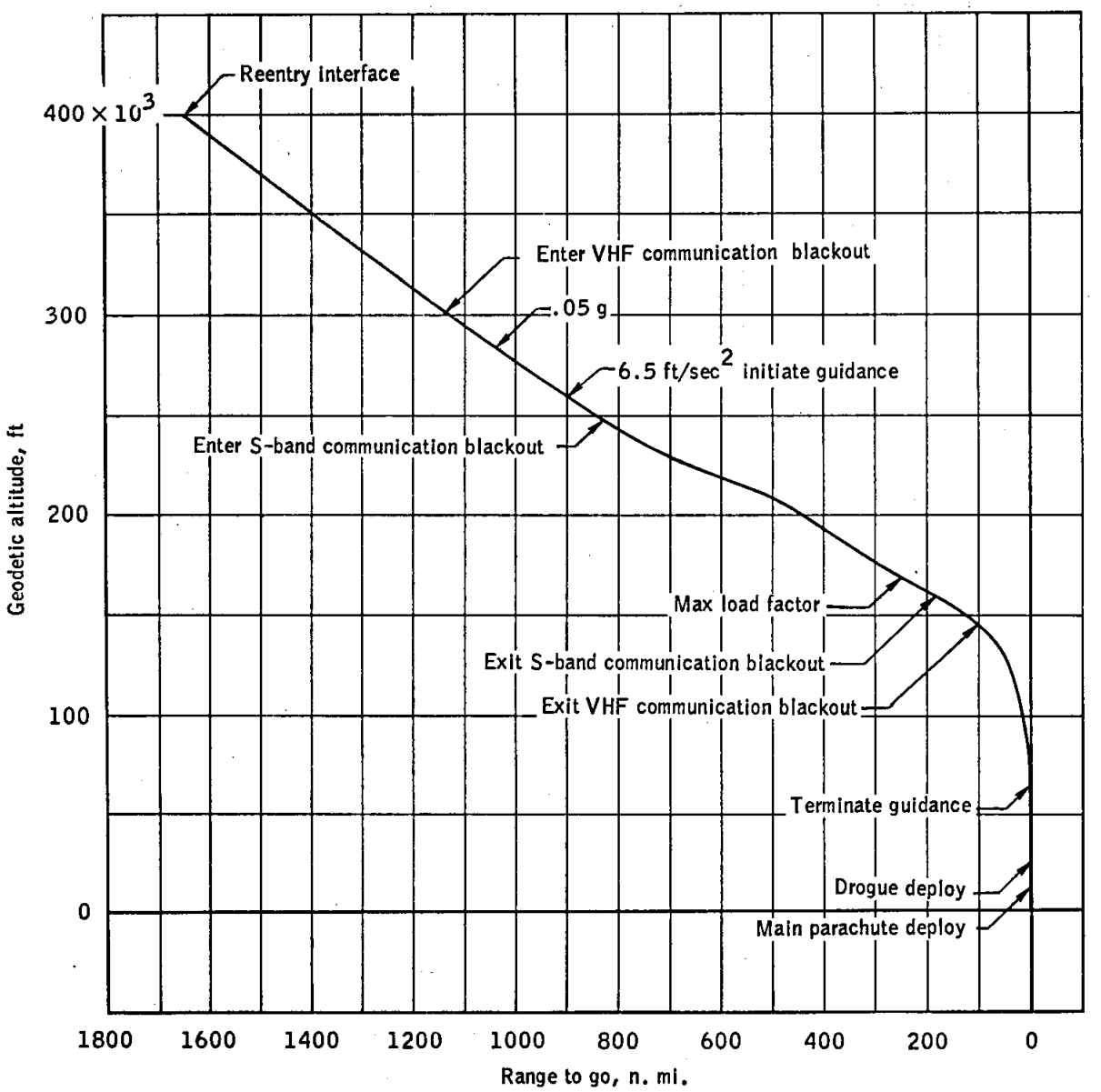


Figure 8.- Altitude and range profile.

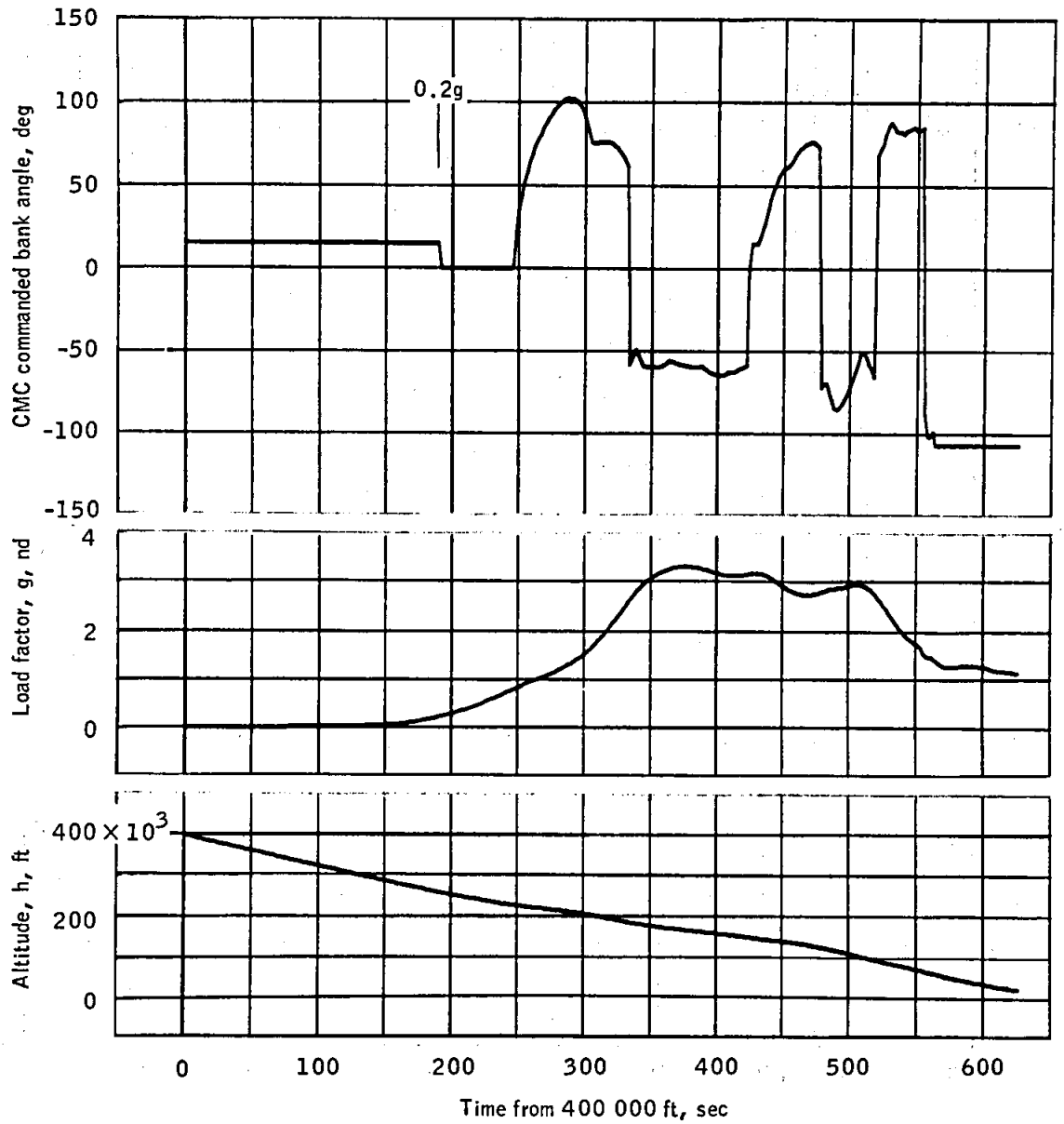


Figure 9.- CMC commanded bank angle, load factor, and altitude time histories.

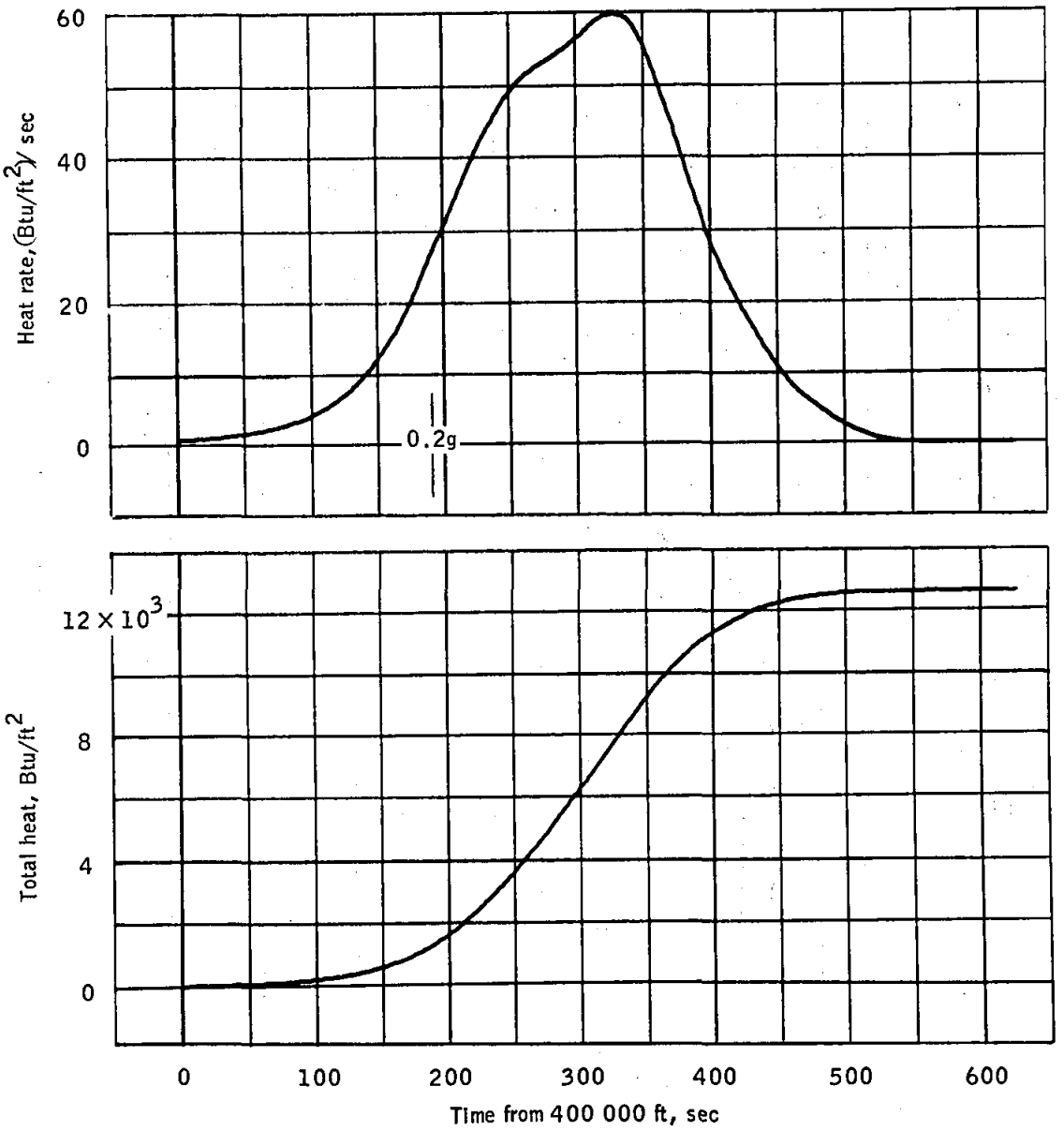


Figure 10.- Aerodynamic heating rate and total heat time histories.

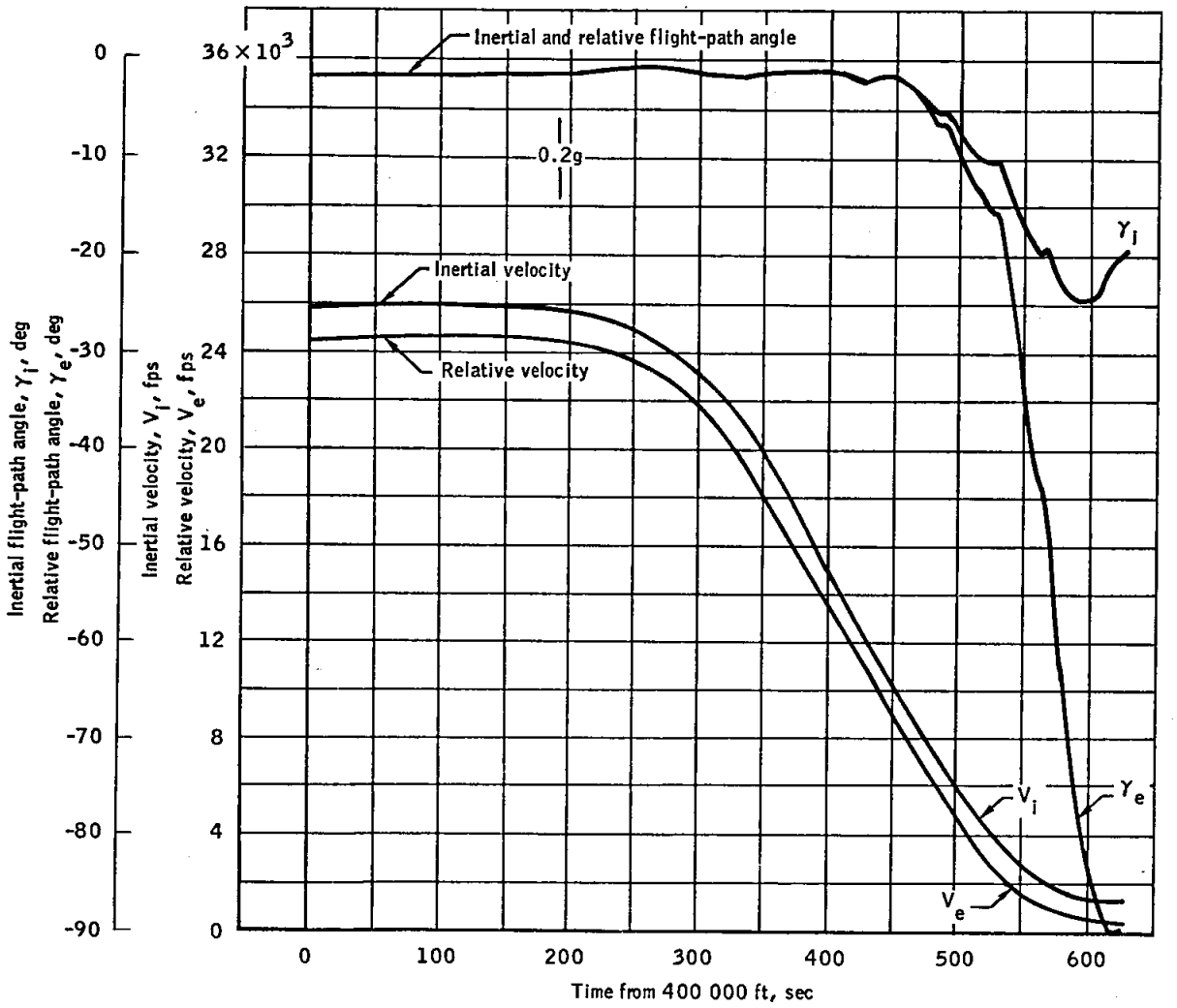


Figure 11.- Reentry velocity and flight-path angle time histories.

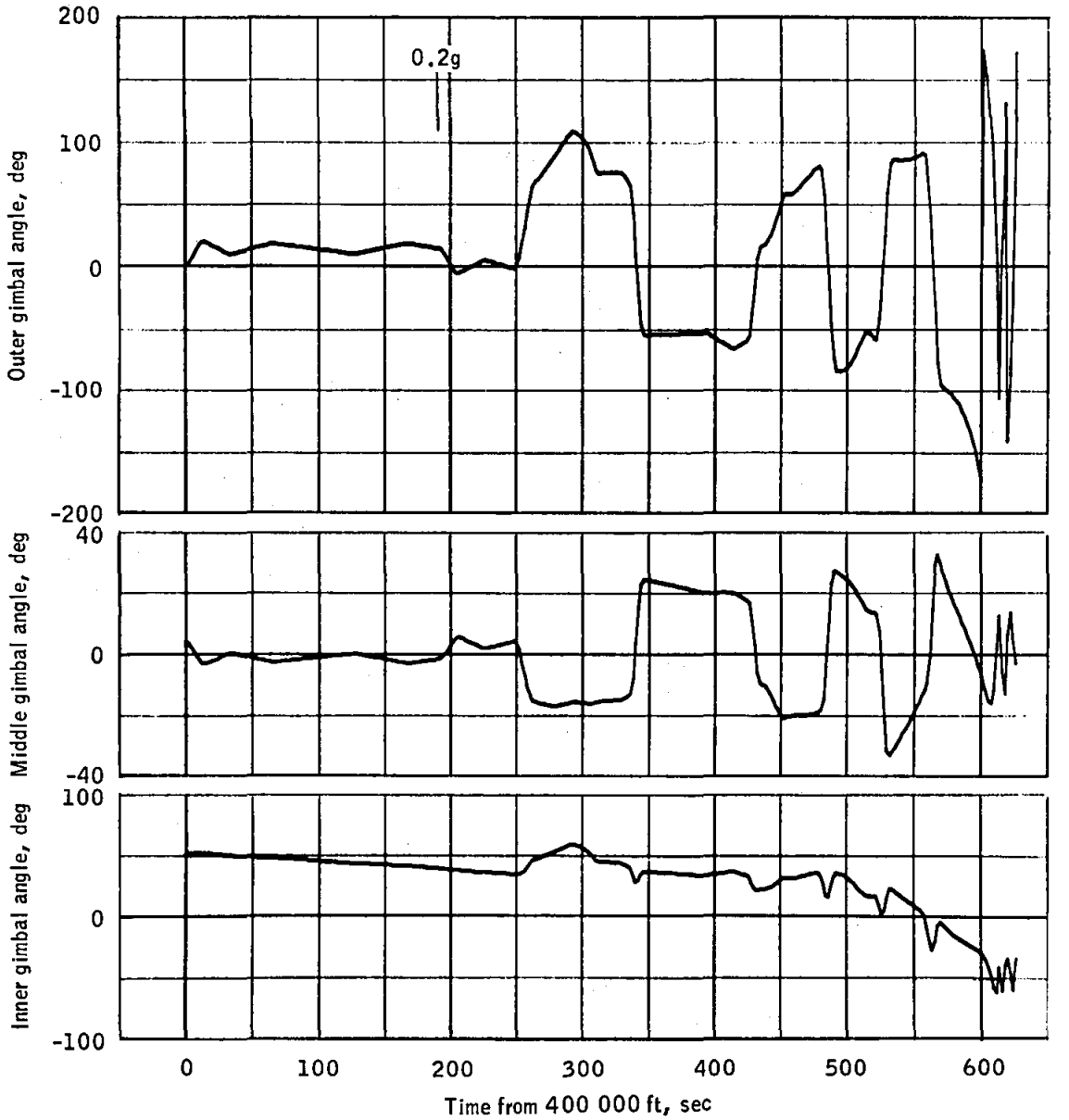


Figure 12.- Reentry gimbal angle time histories.

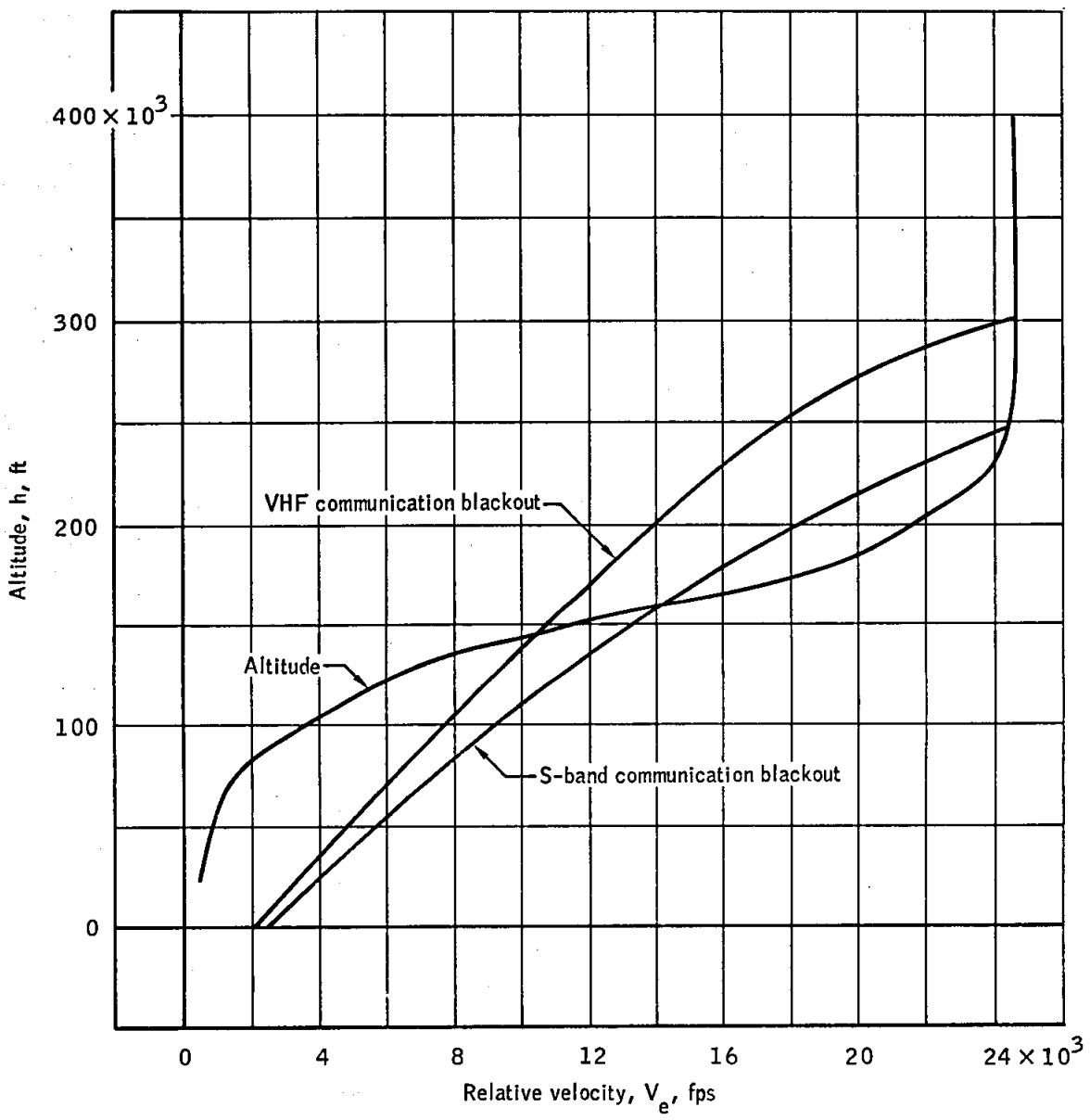


Figure 13.- Communications blackout.

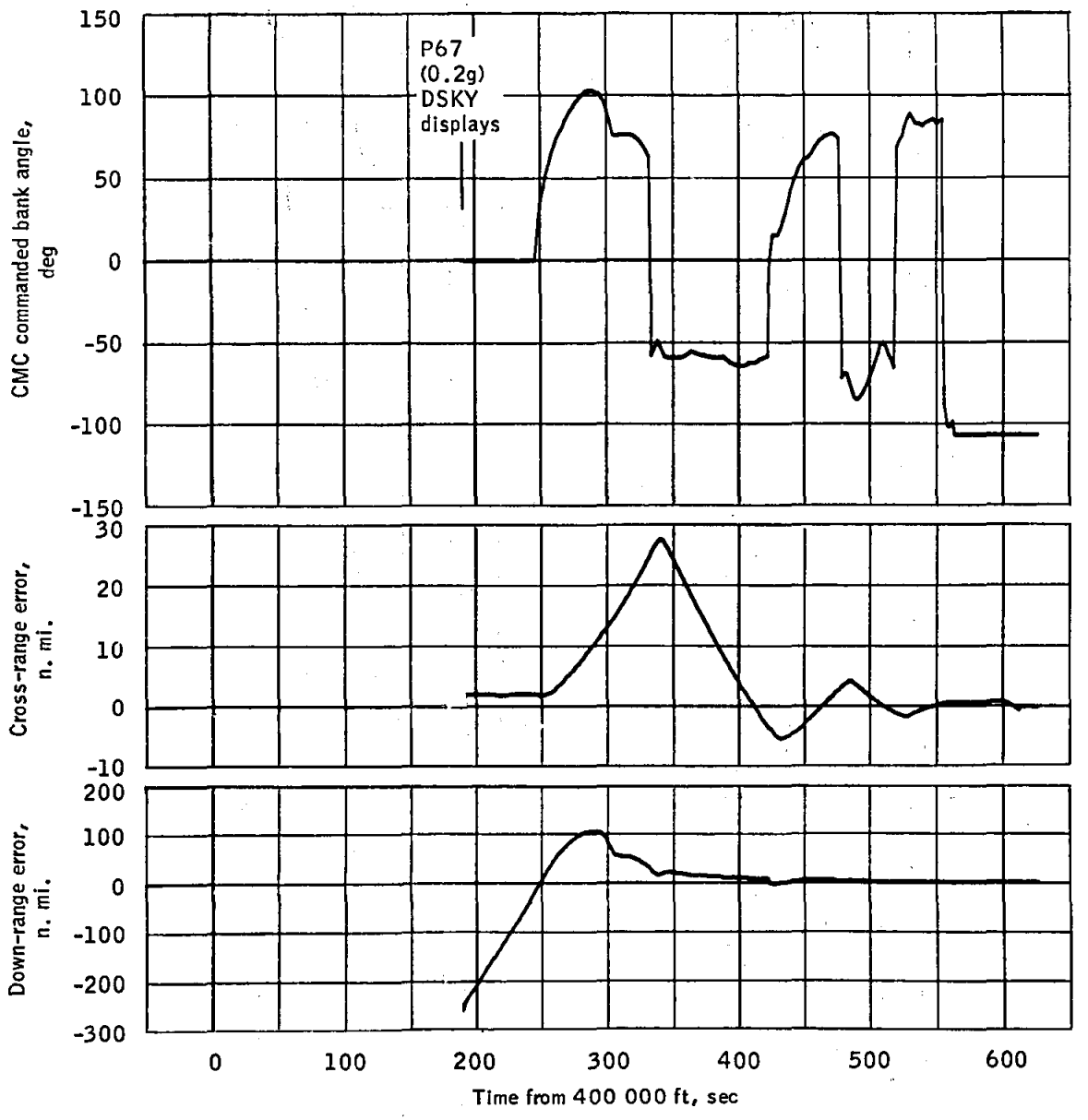
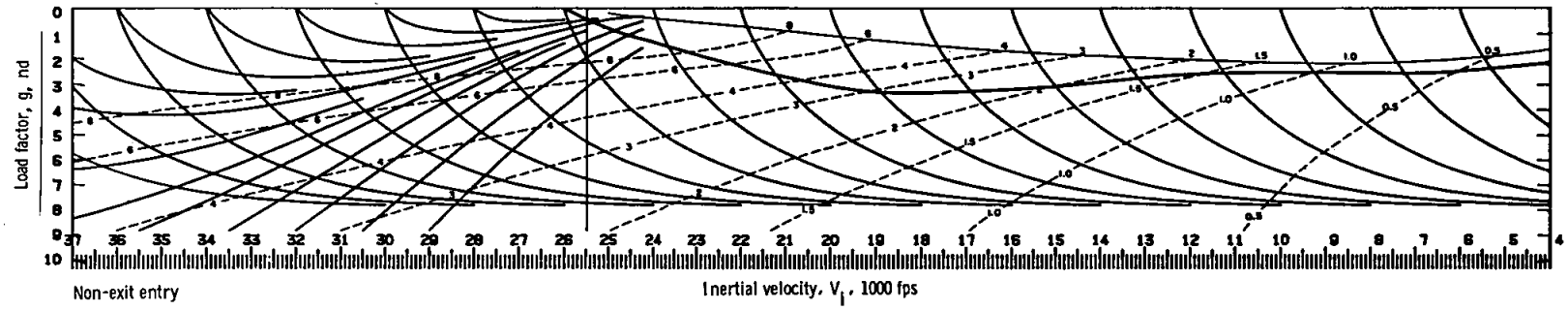
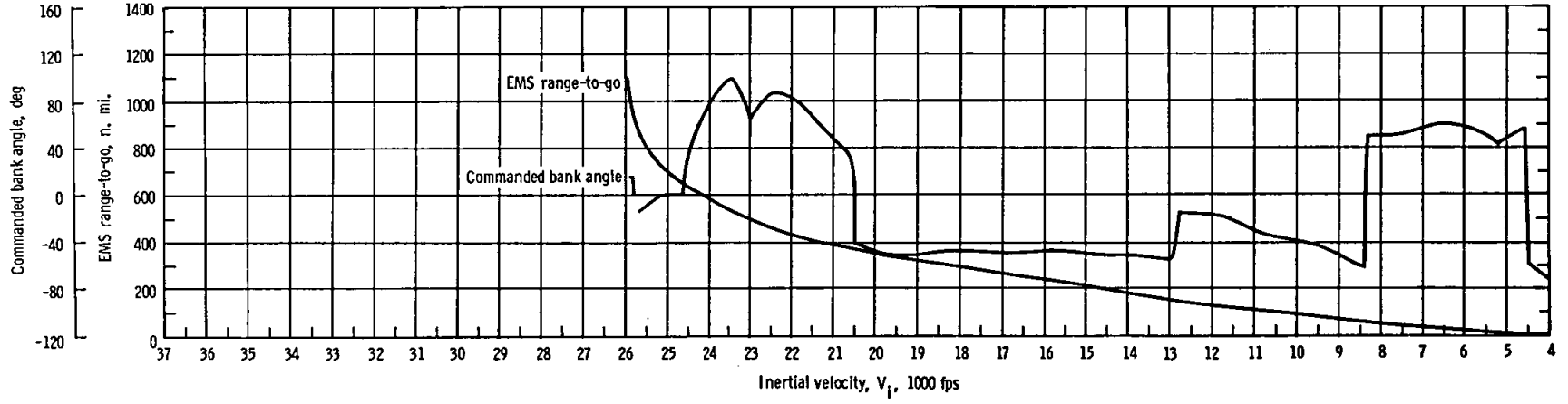


Figure 14.- Program 67 DSKY displayed CMC commanded bank angle, cross-range error, and down-range error time histories.



(a) Load factor versus inertial velocity.



(b) CMC commanded bank angle and EMS range-to-go versus inertial velocity.

Figure 15.- EMS parameters.

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