

D5-15481-1

SATURN V AS-504
LAUNCH VEHICLE
REFERENCE TRAJECTORY
VOLUME II OF II
BOOK 5

MAY 15, 1967

DOCUMENT NO. D5-15481-1 Volume II of II,
Book 5

TITLE SATURN V AS-504 LAUNCH VEHICLE REFERENCE
TRAJECTORY

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D. B. JACOBS
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10.3 TRAJECTORY DATA FOR LAUNCH DURING MARCH 31-APRIL 6,
1968

Trajectory data from preignition-sequence initiation to free-return vacuum perigee are contained in Tables 10-LXXXI through 10-CXX for launch on March 31 and April 2, 4, and 6, 1968.

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 17 HRS., 49 MIN., 26.540 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 8.567000E 03 | |
|----------------------|---------------|-----|---------------|--------------|---------------|
| XXX | -6.137841E 06 | YYY | -8.052551E 04 | ZZZ | -2.359898E 06 |
| DXX | 2.791361E 03 | DYY | -1.368614E 02 | DZZ | -7.267718E 03 |
| R | 6.576374E 06 | WT | 2.973392E 05 | F | 1.684004E 01 |
| V | 7.786536E 03 | PTH | 3.263316E-02 | AZ | 9.451691E 01 |
| ALT | 2.043276E 05 | LAT | -3.227740E 01 | LON | 8.768993E 01 |
| VE | 7.382413E 03 | PTE | 3.441985E-02 | AZE | 9.476473E 01 |
| ANG | 3.879713E 00 | NFA | 9.289761E 01 | IAC | 9.218622E 00 |
| CPA | 6.511913E 01 | VPA | 6.511913E 01 | CYA | -9.575063E-01 |
| VYA | -9.575063E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 8.570000E 03 | |
|----------------------|---------------|-----|---------------|--------------|---------------|
| XXX | -6.129428E 06 | YYY | -8.093564E 04 | ZZZ | -2.381686E 06 |
| DXX | 2.817154E 03 | DYY | -1.365600E 02 | DZZ | -7.257746E 03 |
| R | 6.576388E 06 | WT | 2.973386E 05 | F | 1.683088E 01 |
| V | 7.786519E 03 | PTH | 3.264967E-02 | AZ | 9.438843E 01 |
| ALT | 2.043461E 05 | LAT | -3.229320E 01 | LON | 8.791740E 01 |
| VE | 7.382391E 03 | PTE | 3.443677E-02 | AZE | 9.462917E 01 |
| ANG | 3.879265E 00 | NFA | 9.278981E 01 | IAC | 9.218575E 00 |
| CPA | 6.491562E 01 | VPA | 6.491562E 01 | CYA | -9.550534E-01 |
| VYA | -9.550534E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 8.575000E 03 | |
|----------------------|---------------|-----|---------------|--------------|---------------|
| XXX | -6.115235E 06 | YYY | -8.161717E 04 | ZZZ | -2.417933E 06 |
| DXX | 2.860064E 03 | DYY | -1.360538E 02 | DZZ | -7.240923E 03 |
| R | 6.576410E 06 | WT | 2.973377E 05 | F | 1.681560E 01 |
| V | 7.786491E 03 | PTH | 3.267799E-02 | AZ | 9.417408E 01 |
| ALT | 2.043769E 05 | LAT | -3.231852E 01 | LON | 8.829671E 01 |
| VE | 7.382355E 03 | PTE | 3.446690E-02 | AZE | 9.440303E 01 |
| ANG | 3.878552E 00 | NFA | 9.261004E 01 | IAC | 9.218495E 00 |
| CPA | 6.457643E 01 | VPA | 6.457643E 01 | CYA | -9.509399E-01 |
| VYA | -9.509399E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME 8.580000E 03 | | |
|----------------------|---------------|-----|--------------------------|-----|---------------|
| XXX | -6.100828E 06 | YYY | -8.229617E 04 | ZZZ | -2.454095E 06 |
| DXX | 2.902874E 03 | DYY | -1.355429E 02 | DZZ | -7.223846E 03 |
| R | 6.576432E 06 | WT | 2.973368E 05 | F | 1.680032E 01 |
| V | 7.786463E 03 | PTH | 3.270501E-02 | AZ | 9.395947E 01 |
| ALT | 2.044073E 05 | LAT | -3.234258E 01 | LON | 8.867623E 01 |
| VE | 7.382319E 03 | PTE | 3.449540E-02 | AZE | 9.417661E 01 |
| ANG | 3.877877E 00 | NFA | 9.243009E 01 | IAC | 9.218417E 00 |
| CPA | 6.423724E 01 | VPA | 6.423724E 01 | CYA | -9.467923E-01 |
| VYA | -9.467923E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME 8.585000E 03 | | |
|----------------------|---------------|-----|--------------------------|-----|---------------|
| XXX | -6.086207E 06 | YYY | -8.297260E 04 | ZZZ | -2.490171E 06 |
| DXX | 2.945581E 03 | DYY | -1.350274E 02 | DZZ | -7.206517E 03 |
| R | 6.576454E 06 | WT | 2.973358E 05 | F | 1.678504E 01 |
| V | 7.786435E 03 | PTH | 3.273156E-02 | AZ | 9.374462E 01 |
| ALT | 2.044373E 05 | LAT | -3.236537E 01 | LON | 8.905595E 01 |
| VE | 7.382284E 03 | PTE | 3.452322E-02 | AZE | 9.394994E 01 |
| ANG | 3.877246E 00 | NFA | 9.225001E 01 | IAC | 9.218339E 00 |
| CPA | 6.389806E 01 | VPA | 6.389806E 01 | CYA | -9.426131E-01 |
| VYA | -9.426131E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME 8.590000E 03 | | |
|----------------------|---------------|-----|--------------------------|-----|---------------|
| XXX | -6.071372E 06 | YYY | -8.364643E 04 | ZZZ | -2.526160E 06 |
| DXX | 2.988184E 03 | DYY | -1.345071E 02 | DZZ | -7.188936E 03 |
| R | 6.576476E 06 | WT | 2.973349E 05 | F | 1.676977E 01 |
| V | 7.786407E 03 | PTH | 3.275610E-02 | AZ | 9.352953E 01 |
| ALT | 2.044668E 05 | LAT | -3.238688E 01 | LON | 8.943587E 01 |
| VE | 7.382249E 03 | PTE | 3.454883E-02 | AZE | 9.372302E 01 |
| ANG | 3.876633E 00 | NFA | 9.206978E 01 | IAC | 9.218262E 00 |
| CPA | 6.355888E 01 | VPA | 6.355888E 01 | CYA | -9.384005E-01 |
| VYA | -9.384005E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.595000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.056325E 06 | YYY | -8.431766E 04 | ZZZ -2.562060E 06 |
| DXX | 3.030682E 03 | DYY | -1.339822E 02 | DZZ -7.171104E 03 |
| R | 6.576499E 06 | WT | 2.973340E 05 | F 1.675449E 01 |
| V | 7.786380E 03 | PTH | 3.278147E-02 | AZ 9.331421E 01 |
| ALT | 2.044959E 05 | LAT | -3.240713E 01 | LON 8.981597E 01 |
| VE | 7.382215E 03 | PTE | 3.457658E-02 | AZE 9.349588E 01 |
| ANG | 3.876065E 00 | NFA | 9.188942E 01 | IAC 9.218187E 00 |
| CPA | 6.321971E 01 | VPA | 6.321971E 01 | CYA -9.341547E-01 |
| VYA | -9.341547E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.600000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.041066E 06 | YYY | -8.498625E 04 | ZZZ -2.597871E 06 |
| DXX | 3.073074E 03 | DYY | -1.334526E 02 | DZZ -7.153020E 03 |
| R | 6.576521E 06 | WT | 2.973330E 05 | F 1.673921E 01 |
| V | 7.786353E 03 | PTH | 3.280619E-02 | AZ 9.309869E 01 |
| ALT | 2.045246E 05 | LAT | -3.242610E 01 | LON 9.019624E 01 |
| VE | 7.382182E 03 | PTE | 3.460224E-02 | AZE 9.326852E 01 |
| ANG | 3.875528E 00 | NFA | 9.170894E 01 | IAC 9.218111E 00 |
| CPA | 6.288053E 01 | VPA | 6.288053E 01 | CYA -9.298765E-01 |
| VYA | -9.298765E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.605000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.025595E 06 | YYY | -8.565218E 04 | ZZZ -2.633590E 06 |
| DXX | 3.115358E 03 | DYY | -1.329184E 02 | DZZ -7.134686E 03 |
| R | 6.576543E 06 | WT | 2.973321E 05 | F 1.672393E 01 |
| V | 7.786326E 03 | PTH | 3.282845E-02 | AZ 9.288298E 01 |
| ALT | 2.045530E 05 | LAT | -3.244380E 01 | LON 9.057667E 01 |
| VE | 7.382149E 03 | PTE | 3.462644E-02 | AZE 9.304096E 01 |
| ANG | 3.875035E 00 | NFA | 9.152835E 01 | IAC 9.218037E 00 |
| CPA | 6.254136E 01 | VPA | 6.254136E 01 | CYA -9.255658E-01 |
| VYA | -9.255658E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.610000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.009912E 06 | YYY | -8.631542E 04 | ZZZ -2.669217E 06 |
| DXX | 3.157532E 03 | DYY | -1.323795E 02 | DZZ -7.116103E 03 |
| R | 6.576566E 06 | WT | 2.973312E 05 | F 1.670865E 01 |
| V | 7.786299E 03 | PTH | 3.285182E-02 | AZ 9.266708E 01 |
| ALT | 2.045807E 05 | LAT | -3.246022E 01 | LON 9.095726E 01 |
| VE | 7.382117E 03 | PTE | 3.465113E-02 | AZE 9.281322E 01 |
| ANG | 3.874574E 00 | NFA | 9.134766E 01 | IAC 9.217963E 00 |
| CPA | 6.220219E 01 | VPA | 6.220219E 01 | CYA -9.212226E-01 |
| VYA | -9.212226E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.615000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.994019E 06 | YYY | -8.697597E 04 | ZZZ -2.704751E 06 |
| DXX | 3.199595E 03 | DYY | -1.318361E 02 | DZZ -7.097271E 03 |
| R | 6.576588E 06 | WT | 2.973302E 05 | F 1.669338E 01 |
| V | 7.786272E 03 | PTH | 3.287332E-02 | AZ 9.245101E 01 |
| ALT | 2.046081E 05 | LAT | -3.247536E 01 | LON 9.133798E 01 |
| VE | 7.382085E 03 | PTE | 3.467316E-02 | AZE 9.258530E 01 |
| ANG | 3.874138E 00 | NFA | 9.116688E 01 | IAC 9.217891E 00 |
| CPA | 6.186302E 01 | VPA | 6.186302E 01 | CYA -9.168470E-01 |
| VYA | -9.168470E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.620000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.977917E 06 | YYY | -8.763378E 04 | ZZZ -2.740189E 06 |
| DXX | 3.241545E 03 | DYY | -1.312881E 02 | DZZ -7.078190E 03 |
| R | 6.576610E 06 | WT | 2.973293E 05 | F 1.667810E 01 |
| V | 7.786246E 03 | PTH | 3.289470E-02 | AZ 9.223479E 01 |
| ALT | 2.046354E 05 | LAT | -3.248923E 01 | LON 9.171882E 01 |
| VE | 7.382053E 03 | PTE | 3.469579E-02 | AZE 9.235722E 01 |
| ANG | 3.873740E 00 | NFA | 9.098602E 01 | IAC 9.217818E 00 |
| CPA | 6.152385E 01 | VPA | 6.152385E 01 | CYA -9.124398E-01 |
| VYA | -9.124398E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.625000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.961604E 06 | YYY | -8.828884E 04 | ZZZ -2.775532E 06 |
| DXX | 3.283382E 03 | DYY | -1.307355E 02 | DZZ -7.058862E 03 |
| R | 6.576633E 06 | WT | 2.973284E 05 | F 1.666282E 01 |
| V | 7.786220E 03 | PTH | 3.291439E-02 | AZ 9.201843E 01 |
| ALT | 2.046619E 05 | LAT | -3.250181E 01 | LON 9.209979E 01 |
| VE | 7.382023E 03 | PTE | 3.471689E-02 | AZE 9.212900E 01 |
| ANG | 3.873393E 00 | NFA | 9.080508E 01 | IAC 9.217748E 00 |
| CPA | 6.118469E 01 | VPA | 6.118469E 01 | CYA -9.080002E-01 |
| VYA | -9.080002E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.630000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.945083E 06 | YYY | -8.894112E 04 | ZZZ -2.810778E 06 |
| DXX | 3.325103E 03 | DYY | -1.301783E 02 | DZZ -7.039287E 03 |
| R | 6.576655E 06 | WT | 2.973275E 05 | F 1.664754E 01 |
| V | 7.786194E 03 | PTH | 3.293359E-02 | AZ 9.180195E 01 |
| ALT | 2.046880E 05 | LAT | -3.251312E 01 | LON 9.248085E 01 |
| VE | 7.381993E 03 | PTE | 3.473744E-02 | AZE 9.190065E 01 |
| ANG | 3.873077E 00 | NFA | 9.062408E 01 | IAC 9.217677E 00 |
| CPA | 6.084553E 01 | VPA | 6.084553E 01 | CYA -9.035290E-01 |
| VYA | -9.035290E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.635000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.928353E 06 | YYY | -8.959061E 04 | ZZZ -2.845925E 06 |
| DXX | 3.366707E 03 | DYY | -1.296167E 02 | DZZ -7.019466E 03 |
| R | 6.576677E 06 | WT | 2.973265E 05 | F 1.663227E 01 |
| V | 7.786168E 03 | PTH | 3.295217E-02 | AZ 9.158535E 01 |
| ALT | 2.047139E 05 | LAT | -3.252314E 01 | LON 9.286201E 01 |
| VE | 7.381963E 03 | PTE | 3.475675E-02 | AZE 9.167218E 01 |
| ANG | 3.872792E 00 | NFA | 9.044303E 01 | IAC 9.217608E 00 |
| CPA | 6.050637E 01 | VPA | 6.050637E 01 | CYA -8.990262E-01 |
| VYA | -8.990262E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.640000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.911416E 06 | YYY | -9.023728E 04 | ZZZ -2.880972E 06 |
| DXX | 3.408193E 03 | DYY | -1.290505E 02 | DZZ -6.999399E 03 |
| R | 6.576700E 06 | WT | 2.973256E 05 | F 1.661699E 01 |
| V | 7.786143E 03 | PTH | 3.296948E-02 | AZ 9.136865E 01 |
| ALT | 2.047393E 05 | LAT | -3.253189E 01 | LON 9.324325E 01 |
| VE | 7.381934E 03 | PTE | 3.477502E-02 | AZE 9.144361E 01 |
| ANG | 3.872539E 00 | NFA | 9.026192E 01 | IAC 9.217539E 00 |
| CPA | 6.016721E 01 | VPA | 6.016721E 01 | CYA -8.944910E-01 |
| VYA | -8.944910E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.645000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.894272E 06 | YYY | -9.088111E 04 | ZZZ -2.915918E 06 |
| DXX | 3.449560E 03 | DYY | -1.284798E 02 | DZZ -6.979087E 03 |
| R | 6.576722E 06 | WT | 2.973247E 05 | F 1.660171E 01 |
| V | 7.786118E 03 | PTH | 3.298780E-02 | AZ 9.115186E 01 |
| ALT | 2.047642E 05 | LAT | -3.253935E 01 | LON 9.362457E 01 |
| VE | 7.381905E 03 | PTE | 3.479355E-02 | AZE 9.121495E 01 |
| ANG | 3.872337E 00 | NFA | 9.008080E 01 | IAC 9.217471E 00 |
| CPA | 5.982806E 01 | VPA | 5.982806E 01 | CYA -8.899258E-01 |
| VYA | -8.899258E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.650000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.876921E 06 | YYY | -9.152207E 04 | ZZZ -2.950762E 06 |
| DXX | 3.490805E 03 | DYY | -1.279046E 02 | DZZ -6.958531E 03 |
| R | 6.576745E 06 | WT | 2.973238E 05 | F 1.658643E 01 |
| V | 7.786092E 03 | PTH | 3.300288E-02 | AZ 9.093501E 01 |
| ALT | 2.047887E 05 | LAT | -3.254552E 01 | LON 9.400593E 01 |
| VE | 7.381877E 03 | PTE | 3.480949E-02 | AZE 9.098621E 01 |
| ANG | 3.872154E 00 | NFA | 8.989964E 01 | IAC 9.217404E 00 |
| CPA | 5.948890E 01 | VPA | 5.948890E 01 | CYA -8.853283E-01 |
| VYA | -8.853283E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 8.652000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -5.869923E 06 | YYY | -9.177765E 04 | ZZZ | -2.964671E 06 | 06 |
| DXX | 3.507268E 03 | DYY | -1.276733E 02 | DZZ | -6.950241E 03 | 03 |
| R | 6.576754E 06 | WT | 2.973229E 05 | F | 1.500000E 01 | 01 |
| V | 7.786083E 03 | PTH | 3.300788E-02 | AZ | 9.084825E 01 | 01 |
| ALT | 2.047983E 05 | LAT | -3.254763E 01 | LON | 9.415849E 01 | 01 |
| VE | 7.381866E 03 | PTE | 3.481620E-02 | AZE | 9.089470E 01 | 01 |
| ANG | 3.872097E 00 | NFA | 8.982717E 01 | IAC | 9.217374E 00 | 00 |
| CPA | 5.935324E 01 | VPA | 5.935324E 01 | CYA | -8.834807E-01 | -01 |
| VYA | -8.834807E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 | -39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 8.655000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -5.859364E 06 | YYY | -9.216015E 04 | ZZZ | -2.985503E 06 | 06 |
| DXX | 3.531927E 03 | DYY | -1.273250E 02 | DZZ | -6.937732E 03 | 03 |
| R | 6.576767E 06 | WT | 2.973140E 05 | F | 1.534300E 01 | 01 |
| V | 7.786068E 03 | PTH | 3.301775E-02 | AZ | 9.071809E 01 | 01 |
| ALT | 2.048128E 05 | LAT | -3.255041E 01 | LON | 9.438735E 01 | 01 |
| VE | 7.381850E 03 | PTE | 3.482553E-02 | AZE | 9.075742E 01 | 01 |
| ANG | 3.872015E 00 | NFA | 8.971845E 01 | IAC | 9.217335E 00 | 00 |
| CPA | 5.914975E 01 | VPA | 5.914975E 01 | CYA | -8.806991E-01 | -01 |
| VYA | -8.806991E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 | -39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 8.660000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -5.841602E 06 | YYY | -9.279532E 04 | ZZZ | -3.020139E 06 | 06 |
| DXX | 3.572925E 03 | DYY | -1.267409E 02 | DZZ | -6.916690E 03 | 03 |
| R | 6.576790E 06 | WT | 2.972991E 05 | F | 1.591468E 01 | 01 |
| V | 7.786043E 03 | PTH | 3.303252E-02 | AZ | 9.050114E 01 | 01 |
| ALT | 2.048365E 05 | LAT | -3.255402E 01 | LON | 9.476880E 01 | 01 |
| VE | 7.381823E 03 | PTE | 3.484077E-02 | AZE | 9.052858E 01 | 01 |
| ANG | 3.871914E 00 | NFA | 8.953729E 01 | IAC | 9.217271E 00 | 00 |
| CPA | 5.881061E 01 | VPA | 5.881061E 01 | CYA | -8.760409E-01 | -01 |
| VYA | -8.760409E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 | -39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.665000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.823635E 06 | YYY | -9.342755E 04 | ZZZ -3.054670E 06 |
| DXX | 3.613798E 03 | DYY | -1.261525E 02 | DZZ -6.895407E 03 |
| R | 6.576812E 06 | WT | 2.972842E 05 | F 1.648635E 01 |
| V | 7.786018E 03 | PTH | 3.304580E-02 | AZ 9.028415E 01 |
| ALT | 2.048596E 05 | LAT | -3.255635E 01 | LON 9.515028E 01 |
| VE | 7.381796E 03 | PTE | 3.485530E-02 | AZE 9.029971E 01 |
| ANG | 3.871850E 00 | NFA | 8.935611E 01 | IAC 9.217208E 00 |
| CPA | 5.847146E 01 | VPA | 5.847146E 01 | CYA -8.713503E-01 |
| VYA | -8.713503E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.670000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.805464E 06 | YYY | -9.405683E 04 | ZZZ -3.089093E 06 |
| DXX | 3.654544E 03 | DYY | -1.255596E 02 | DZZ -6.873882E 03 |
| R | 6.576834E 06 | WT | 2.972693E 05 | F 1.705803E 01 |
| V | 7.785994E 03 | PTH | 3.305795E-02 | AZ 9.006714E 01 |
| ALT | 2.048825E 05 | LAT | -3.255739E 01 | LON 9.553177E 01 |
| VE | 7.381771E 03 | PTE | 3.486753E-02 | AZE 9.007082E 01 |
| ANG | 3.871825E 00 | NFA | 8.917494E 01 | IAC 9.217145E 00 |
| CPA | 5.813232E 01 | VPA | 5.813232E 01 | CYA -8.666289E-01 |
| VYA | -8.666289E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.675000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.787089E 06 | YYY | -9.468314E 04 | ZZZ -3.123408E 06 |
| DXX | 3.695162E 03 | DYY | -1.249623E 02 | DZZ -6.852117E 03 |
| R | 6.576857E 06 | WT | 2.972544E 05 | F 1.762970E 01 |
| V | 7.785971E 03 | PTH | 3.306973E-02 | AZ 8.985013E 01 |
| ALT | 2.049048E 05 | LAT | -3.255714E 01 | LON 9.591326E 01 |
| VE | 7.381746E 03 | PTE | 3.488031E-02 | AZE 8.984193E 01 |
| ANG | 3.871838E 00 | NFA | 8.899382E 01 | IAC 9.217084E 00 |
| CPA | 5.779318E 01 | VPA | 5.779318E 01 | CYA -8.618785E-01 |
| VYA | -8.618785E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.680000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.768512E 06 | YYY | -9.530645E 04 | ZZZ -3.157614E 06 |
| DXX | 3.735650E 03 | DYY | -1.243606E 02 | DZZ -6.830112E 03 |
| R | 6.576879E 06 | WT | 2.972395E 05 | F 1.820138E 01 |
| V | 7.785947E 03 | PTH | 3.308033E-02 | AZ 8.963313E 01 |
| ALT | 2.049267E 05 | LAT | -3.255561E 01 | LON 9.629473E 01 |
| VE | 7.381721E 03 | PTE | 3.489181E-02 | AZE 8.961304E 01 |
| ANG | 3.871869E 00 | NFA | 8.881272E 01 | IAC 9.217023E 00 |
| CPA | 5.745404E 01 | VPA | 5.745404E 01 | CYA -8.570965E-01 |
| VYA | -8.570965E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.685000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.749733E 06 | YYY | -9.592674E 04 | ZZZ -3.191709E 06 |
| DXX | 3.776007E 03 | DYY | -1.237546E 02 | DZZ -6.807869E 03 |
| R | 6.576902E 06 | WT | 2.972246E 05 | F 1.877305E 01 |
| V | 7.785924E 03 | PTH | 3.309074E-02 | AZ 8.941616E 01 |
| ALT | 2.049483E 05 | LAT | -3.255280E 01 | LON 9.667619E 01 |
| VE | 7.381698E 03 | PTE | 3.490194E-02 | AZE 8.938419E 01 |
| ANG | 3.871964E 00 | NFA | 8.863166E 01 | IAC 9.216963E 00 |
| CPA | 5.711490E 01 | VPA | 5.711490E 01 | CYA -8.522847E-01 |
| VYA | -8.522847E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.690000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.730753E 06 | YYY | -9.654399E 04 | ZZZ -3.225692E 06 |
| DXX | 3.816231E 03 | DYY | -1.231443E 02 | DZZ -6.785387E 03 |
| R | 6.576924E 06 | WT | 2.972097E 05 | F 1.934473E 01 |
| V | 7.785901E 03 | PTH | 3.309889E-02 | AZ 8.919923E 01 |
| ALT | 2.049694E 05 | LAT | -3.254870E 01 | LON 9.705762E 01 |
| VE | 7.381674E 03 | PTE | 3.491143E-02 | AZE 8.915537E 01 |
| ANG | 3.872072E 00 | NFA | 8.845066E 01 | IAC 9.216905E 00 |
| CPA | 5.677576E 01 | VPA | 5.677576E 01 | CYA -8.474429E-01 |
| VYA | -8.474429E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -5.711571E 06 | YYY | -9.715817E 04 | ZZZ | -3.259562E 06 |
| DXX | 3.856322E 03 | DYY | -1.225296E 02 | DZZ | -6.762668E 03 |
| R | 6.576947E 06 | WT | 2.971948E 05 | F | 1.991640E 01 |
| V | 7.785879E 03 | PTH | 3.310534E-02 | AZ | 8.898234E 01 |
| ALT | 2.049902E 05 | LAT | -3.254332E 01 | LON | 9.743899E 01 |
| VE | 7.381652E 03 | PTE | 3.491761E-02 | AZE | 8.892661E 01 |
| ANG | 3.872223E 00 | NFA | 8.826972E 01 | IAC | 9.216846E 00 |
| CPA | 5.643663E 01 | VPA | 5.643663E 01 | CYA | -8.425713E-01 |
| VYA | -8.425713E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -5.692190E 06 | YYY | -9.776928E 04 | ZZZ | -3.293318E 06 |
| DXX | 3.896277E 03 | DYY | -1.219107E 02 | DZZ | -6.739713E 03 |
| R | 6.576969E 06 | WT | 2.971800E 05 | F | 2.048808E 01 |
| V | 7.785857E 03 | PTH | 3.311153E-02 | AZ | 8.876553E 01 |
| ALT | 2.050103E 05 | LAT | -3.253665E 01 | LON | 9.782031E 01 |
| VE | 7.381630E 03 | PTE | 3.492447E-02 | AZE | 8.869792E 01 |
| ANG | 3.872419E 00 | NFA | 8.808886E 01 | IAC | 9.216789E 00 |
| CPA | 5.609750E 01 | VPA | 5.609750E 01 | CYA | -8.376698E-01 |
| VYA | -8.376698E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -5.672609E 06 | YYY | -9.837728E 04 | ZZZ | -3.326959E 06 |
| DXX | 3.936095E 03 | DYY | -1.212875E 02 | DZZ | -6.716523E 03 |
| R | 6.576992E 06 | WT | 2.971651E 05 | F | 2.105975E 01 |
| V | 7.785835E 03 | PTH | 3.311728E-02 | AZ | 8.854879E 01 |
| ALT | 2.050303E 05 | LAT | -3.252871E 01 | LON | 9.820157E 01 |
| VE | 7.381609E 03 | PTE | 3.493113E-02 | AZE | 8.846930E 01 |
| ANG | 3.872634E 00 | NFA | 8.790807E 01 | IAC | 9.216732E 00 |
| CPA | 5.575837E 01 | VPA | 5.575837E 01 | CYA | -8.327384E-01 |
| VYA | -8.327384E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.710000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.652829E 06 | YYY | -9.898214E 04 | ZZZ -3.360483E 06 |
| DXX | 3.975776E 03 | DYY | -1.206600E 02 | DZZ -6.693097E 03 |
| R | 6.577014E 06 | WT | 2.971502E 05 | F 2.163143E 01 |
| V | 7.785814E 03 | PTH | 3.312327E-02 | AZ 8.833215E 01 |
| ALT | 2.050495E 05 | LAT | -3.251948E 01 | LON 9.858274E 01 |
| VE | 7.381589E 03 | PTE | 3.493727E-02 | AZE 8.824079E 01 |
| ANG | 3.872900E 00 | NFA | 8.772738E 01 | IAC 9.216677E 00 |
| CPA | 5.541924E 01 | VPA | 5.541924E 01 | CYA -8.277779E-01 |
| VYA | -8.277779E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.715000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.632851E 06 | YYY | -9.958387E 04 | ZZZ -3.393889E 06 |
| DXX | 4.015317E 03 | DYY | -1.200283E 02 | DZZ -6.669437E 03 |
| R | 6.577037E 06 | WT | 2.971353E 05 | F 2.220310E 01 |
| V | 7.785793E 03 | PTH | 3.312638E-02 | AZ 8.811561E 01 |
| ALT | 2.050685E 05 | LAT | -3.250897E 01 | LON 9.896383E 01 |
| VE | 7.381569E 03 | PTE | 3.494068E-02 | AZE 8.801238E 01 |
| ANG | 3.873203E 00 | NFA | 8.754678E 01 | IAC 9.216622E 00 |
| CPA | 5.508012E 01 | VPA | 5.508012E 01 | CYA -8.227876E-01 |
| VYA | -8.227876E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.720000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.612676E 06 | YYY | -1.001824E 05 | ZZZ -3.427177E 06 |
| DXX | 4.054717E 03 | DYY | -1.193924E 02 | DZZ -6.645545E 03 |
| R | 6.577059E 06 | WT | 2.971204E 05 | F 2.277478E 01 |
| V | 7.785772E 03 | PTH | 3.312861E-02 | AZ 8.789920E 01 |
| ALT | 2.050870E 05 | LAT | -3.249718E 01 | LON 9.934480E 01 |
| VE | 7.381550E 03 | PTE | 3.494253E-02 | AZE 8.778410E 01 |
| ANG | 3.873532E 00 | NFA | 8.736629E 01 | IAC 9.216568E 00 |
| CPA | 5.474099E 01 | VPA | 5.474099E 01 | CYA -8.177683E-01 |
| VYA | -8.177683E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.725000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.592304E 06 | YYY | -1.007778E 05 | ZZZ -3.460345E 06 |
| DXX | 4.093975E 03 | DYY | -1.187522E 02 | DZZ -6.621420E 03 |
| R | 6.577082E 06 | WT | 2.971055E 05 | F 2.334645E 01 |
| V | 7.785752E 03 | PTH | 3.313062E-02 | AZ 8.768292E 01 |
| ALT | 2.051051E 05 | LAT | -3.248410E 01 | LON 9.972567E 01 |
| VE | 7.381532E 03 | PTE | 3.494519E-02 | AZE 8.755596E 01 |
| ANG | 3.873904E 00 | NFA | 8.718594E 01 | IAC 9.216515E 00 |
| CPA | 5.440187E 01 | VPA | 5.440187E 01 | CYA -8.127208E-01 |
| VYA | -8.127208E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.730000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.571736E 06 | YYY | -1.013699E 05 | ZZZ -3.493391E 06 |
| DXX | 4.133089E 03 | DYY | -1.181080E 02 | DZZ -6.597063E 03 |
| R | 6.577104E 06 | WT | 2.970906E 05 | F 2.391813E 01 |
| V | 7.785732E 03 | PTH | 3.313222E-02 | AZ 8.746679E 01 |
| ALT | 2.051227E 05 | LAT | -3.246975E 01 | LON 1.001064E 02 |
| VE | 7.381514E 03 | PTE | 3.494663E-02 | AZE 8.732797E 01 |
| ANG | 3.874309E 00 | NFA | 8.700570E 01 | IAC 9.216463E 00 |
| CPA | 5.406275E 01 | VPA | 5.406275E 01 | CYA -8.076434E-01 |
| VYA | -8.076434E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.735000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.550973E 06 | YYY | -1.019589E 05 | ZZZ -3.526315E 06 |
| DXX | 4.172058E 03 | DYY | -1.174595E 02 | DZZ -6.572476E 03 |
| R | 6.577127E 06 | WT | 2.970757E 05 | F 2.448980E 01 |
| V | 7.785712E 03 | PTH | 3.313130E-02 | AZ 8.725082E 01 |
| ALT | 2.051400E 05 | LAT | -3.245413E 01 | LON 1.004870E 02 |
| VE | 7.381497E 03 | PTE | 3.494557E-02 | AZE 8.710015E 01 |
| ANG | 3.874751E 00 | NFA | 8.682561E 01 | IAC 9.216411E 00 |
| CPA | 5.372364E 01 | VPA | 5.372364E 01 | CYA -8.025378E-01 |
| VYA | -8.025378E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.740000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.530616E 06 | YYY | -1.025445E 05 | ZZZ -3.559115E 06 |
| DXX | 4.210881E 03 | DYY | -1.168069E 02 | DZZ -6.547659E 03 |
| R | 6.577149E 06 | WT | 2.970608E 05 | F 2.506148E 01 |
| V | 7.785692E 03 | PTH | 3.312928E-02 | AZ 8.703503E 01 |
| ALT | 2.051567E 05 | LAT | -3.243722E 01 | LON 1.008675E 02 |
| VE | 7.381480E 03 | PTE | 3.494430E-02 | AZE 8.687251E 01 |
| ANG | 3.875218E 00 | NFA | 8.664566E 01 | IAC 9.216361E 00 |
| CPA | 5.338452E 01 | VPA | 5.338452E 01 | CYA -7.974032E-01 |
| VYA | -7.974032E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.745000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.508865E 06 | YYY | -1.031269E 05 | ZZZ -3.591791E 06 |
| DXX | 4.249557E 03 | DYY | -1.161503E 02 | DZZ -6.522613E 03 |
| R | 6.577172E 06 | WT | 2.970459E 05 | F 2.563315E 01 |
| V | 7.785673E 03 | PTH | 3.312751E-02 | AZ 8.681942E 01 |
| ALT | 2.051731E 05 | LAT | -3.241904E 01 | LON 1.012478E 02 |
| VE | 7.381464E 03 | PTE | 3.494120E-02 | AZE 8.664506E 01 |
| ANG | 3.875743E 00 | NFA | 8.646588E 01 | IAC 9.216311E 00 |
| CPA | 5.304540E 01 | VPA | 5.304540E 01 | CYA -7.922413E-01 |
| VYA | -7.922413E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.750000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.487521E 06 | YYY | -1.037060E 05 | ZZZ -3.624341E 06 |
| DXX | 4.288083E 03 | DYY | -1.154895E 02 | DZZ -6.497340E 03 |
| R | 6.577194E 06 | WT | 2.970310E 05 | F 2.620483E 01 |
| V | 7.785655E 03 | PTH | 3.312343E-02 | AZ 8.660402E 01 |
| ALT | 2.051890E 05 | LAT | -3.239959E 01 | LON 1.016279E 02 |
| VE | 7.381449E 03 | PTE | 3.493717E-02 | AZE 8.641782E 01 |
| ANG | 3.876286E 00 | NFA | 8.628626E 01 | IAC 9.216262E 00 |
| CPA | 5.270629E 01 | VPA | 5.270629E 01 | CYA -7.870504E-01 |
| VYA | -7.870504E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.755000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.465984E 06 | YYY | -1.042818E 05 | ZZZ -3.656764E 06 |
| DXX | 4.326459E 03 | DYY | -1.148246E 02 | DZZ -6.471839E 03 |
| R | 6.577217E 06 | WT | 2.970161E 05 | F 2.677650E 01 |
| V | 7.785636E 03 | PTH | 3.312007E-02 | AZ 8.638883E 01 |
| ALT | 2.052045E 05 | LAT | -3.237887E 01 | LON 1.020079E 02 |
| VE | 7.381435E 03 | PTE | 3.493365E-02 | AZE 8.619081E 01 |
| ANG | 3.876879E 00 | NFA | 8.610681E 01 | IAC 9.216214E 00 |
| CPA | 5.236718E 01 | VPA | 5.236718E 01 | CYA -7.818313E-01 |
| VYA | -7.818313E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.760000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.444256E 06 | YYY | -1.048543E 05 | ZZZ -3.689059E 06 |
| DXX | 4.364684E 03 | DYY | -1.141557E 02 | DZZ -6.446111E 03 |
| R | 6.577239E 06 | WT | 2.970012E 05 | F 2.734818E 01 |
| V | 7.785618E 03 | PTH | 3.311459E-02 | AZ 8.617388E 01 |
| ALT | 2.052195E 05 | LAT | -3.235688E 01 | LON 1.023876E 02 |
| VE | 7.381421E 03 | PTE | 3.492723E-02 | AZE 8.596403E 01 |
| ANG | 3.877498E 00 | NFA | 8.592758E 01 | IAC 9.216167E 00 |
| CPA | 5.202807E 01 | VPA | 5.202807E 01 | CYA -7.765865E-01 |
| VYA | -7.765865E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.765000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.422338E 06 | YYY | -1.054234E 05 | ZZZ -3.721225E 06 |
| DXX | 4.402755E 03 | DYY | -1.134828E 02 | DZZ -6.420159E 03 |
| R | 6.577262E 06 | WT | 2.969864E 05 | F 2.791985E 01 |
| V | 7.785600E 03 | PTH | 3.310842E-02 | AZ 8.595916E 01 |
| ALT | 2.052342E 05 | LAT | -3.233361E 01 | LON 1.027672E 02 |
| VE | 7.381408E 03 | PTE | 3.492179E-02 | AZE 8.573750E 01 |
| ANG | 3.878148E 00 | NFA | 8.574852E 01 | IAC 9.216121E 00 |
| CPA | 5.168897E 01 | VPA | 5.168897E 01 | CYA -7.713119E-01 |
| VYA | -7.713119E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.770000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.400229E 06 | YYY | -1.059891E 05 | ZZZ -3.753260E 06 |
| DXX | 4.440673E 03 | DYY | -1.128059E 02 | DZZ -6.393982E 03 |
| R | 6.577284E 06 | WT | 2.969715E 05 | F 2.849153E 01 |
| V | 7.785583E 03 | PTH | 3.310055E-02 | AZ 8.574471E 01 |
| ALT | 2.052484E 05 | LAT | -3.230908E 01 | LON 1.031465E 02 |
| VE | 7.381395E 03 | PTE | 3.491338E-02 | AZE 8.551123E 01 |
| ANG | 3.878842E 00 | NFA | 8.556967E 01 | IAC 9.216076E 00 |
| CPA | 5.134986E 01 | VPA | 5.134986E 01 | CYA -7.660100E-01 |
| VYA | -7.660100E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.775000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.377931E 06 | YYY | -1.065514E 05 | ZZZ -3.785164E 06 |
| DXX | 4.478434E 03 | DYY | -1.121249E 02 | DZZ -6.367581E 03 |
| R | 6.577307E 06 | WT | 2.969566E 05 | F 2.906320E 01 |
| V | 7.785566E 03 | PTH | 3.309333E-02 | AZ 8.553052E 01 |
| ALT | 2.052622E 05 | LAT | -3.228329E 01 | LON 1.035256E 02 |
| VE | 7.381383E 03 | PTE | 3.490514E-02 | AZE 8.528524E 01 |
| ANG | 3.879574E 00 | NFA | 8.539103E 01 | IAC 9.216031E 00 |
| CPA | 5.101076E 01 | VPA | 5.101076E 01 | CYA -7.606807E-01 |
| VYA | -7.606807E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.780000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.355445E 06 | YYY | -1.071103E 05 | ZZZ -3.816936E 06 |
| DXX | 4.516039E 03 | DYY | -1.114401E 02 | DZZ -6.340958E 03 |
| R | 6.577329E 06 | WT | 2.969417E 05 | F 2.963488E 01 |
| V | 7.785549E 03 | PTH | 3.308264E-02 | AZ 8.531661E 01 |
| ALT | 2.052755E 05 | LAT | -3.225623E 01 | LON 1.039045E 02 |
| VE | 7.381372E 03 | PTE | 3.489456E-02 | AZE 8.505954E 01 |
| ANG | 3.880344E 00 | NFA | 8.521263E 01 | IAC 9.215987E 00 |
| CPA | 5.067166E 01 | VPA | 5.067166E 01 | CYA -7.553250E-01 |
| VYA | -7.553250E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.785000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.332771E 06 | YYY | -1.076658E 05 | ZZZ -3.848573E 06 |
| DXX | 4.553485E 03 | DYY | -1.107512E 02 | DZZ -6.314113E 03 |
| R | 6.577352E 06 | WT | 2.969268E 05 | F 3.020655E 01 |
| V | 7.785533E 03 | PTH | 3.307254E-02 | AZ 8.510300E 01 |
| ALT | 2.052884E 05 | LAT | -3.222792E 01 | LON 1.042831E 02 |
| VE | 7.381362E 03 | PTE | 3.488408E-02 | AZE 8.483415E 01 |
| ANG | 3.881126E 00 | NFA | 8.503445E 01 | IAC 9.215944E 00 |
| CPA | 5.033256E 01 | VPA | 5.033256E 01 | CYA -7.499420E-01 |
| VYA | -7.499420E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.790000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.309910E 06 | YYY | -1.082178E 05 | ZZZ -3.880076E 06 |
| DXX | 4.590772E 03 | DYY | -1.100585E 02 | DZZ -6.287048E 03 |
| R | 6.577374E 06 | WT | 2.969119E 05 | F 3.077823E 01 |
| V | 7.785517E 03 | PTH | 3.306174E-02 | AZ 8.488969E 01 |
| ALT | 2.053009E 05 | LAT | -3.219834E 01 | LON 1.046615E 02 |
| VE | 7.381352E 03 | PTE | 3.487173E-02 | AZE 8.460907E 01 |
| ANG | 3.881952E 00 | NFA | 8.485651E 01 | IAC 9.215902E 00 |
| CPA | 4.999346E 01 | VPA | 4.999346E 01 | CYA -7.445316E-01 |
| VYA | -7.445316E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.795000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.286864E 06 | YYY | -1.087664E 05 | ZZZ -3.911444E 06 |
| DXX | 4.627898E 03 | DYY | -1.093618E 02 | DZZ -6.259763E 03 |
| R | 6.577397E 06 | WT | 2.968970E 05 | F 3.134990E 01 |
| V | 7.785501E 03 | PTH | 3.304976E-02 | AZ 8.467671E 01 |
| ALT | 2.053130E 05 | LAT | -3.216751E 01 | LON 1.050396E 02 |
| VE | 7.381343E 03 | PTE | 3.485970E-02 | AZE 8.438432E 01 |
| ANG | 3.882816E 00 | NFA | 8.467883E 01 | IAC 9.215861E 00 |
| CPA | 4.965436E 01 | VPA | 4.965436E 01 | CYA -7.390948E-01 |
| VYA | -7.390948E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.800000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.263632E 06 | YYY | -1.093114E 05 | ZZZ -3.942674E 06 |
| DXX | 4.664862E 03 | DYY | -1.086613E 02 | DZZ -6.232259E 03 |
| R | 6.577419E 06 | WT | 2.968821E 05 | F 3.192158E 01 |
| V | 7.785486E 03 | PTH | 3.303617E-02 | AZ 8.446406E 01 |
| ALT | 2.053246E 05 | LAT | -3.213542E 01 | LON 1.054175E 02 |
| VE | 7.381334E 03 | PTE | 3.484472E-02 | AZE 8.415992E 01 |
| ANG | 3.883724E 00 | NFA | 8.450143E 01 | IAC 9.215821E 00 |
| CPA | 4.931527E 01 | VPA | 4.931527E 01 | CYA -7.336332E-01 |
| VYA | -7.336332E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.805000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.240215E 06 | YYY | -1.098530E 05 | ZZZ -3.973766E 06 |
| DXX | 4.701662E 03 | DYY | -1.079569E 02 | DZZ -6.204537E 03 |
| R | 6.577442E 06 | WT | 2.968672E 05 | F 3.249325E 01 |
| V | 7.785471E 03 | PTH | 3.302169E-02 | AZ 8.425176E 01 |
| ALT | 2.053358E 05 | LAT | -3.210208E 01 | LON 1.057950E 02 |
| VE | 7.381326E 03 | PTE | 3.483003E-02 | AZE 8.393588E 01 |
| ANG | 3.884663E 00 | NFA | 8.432428E 01 | IAC 9.215782E 00 |
| CPA | 4.897618E 01 | VPA | 4.897618E 01 | CYA -7.281434E-01 |
| VYA | -7.281434E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.810000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.216615E 06 | YYY | -1.103910E 05 | ZZZ -4.004719E 06 |
| DXX | 4.738297E 03 | DYY | -1.072487E 02 | DZZ -6.175598E 03 |
| R | 6.577464E 06 | WT | 2.968523E 05 | F 3.306493E 01 |
| V | 7.785456E 03 | PTH | 3.300642E-02 | AZ 8.403981E 01 |
| ALT | 2.053466E 05 | LAT | -3.206750E 01 | LON 1.061722E 02 |
| VE | 7.381319E 03 | PTE | 3.481353E-02 | AZE 8.371220E 01 |
| ANG | 3.885633E 00 | NFA | 8.414741E 01 | IAC 9.215743E 00 |
| CPA | 4.863708E 01 | VPA | 4.863708E 01 | CYA -7.226280E-01 |
| VYA | -7.226280E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.815000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.192833E 06 | YYY | -1.109255E 05 | ZZZ -4.035531E 06 |
| DXX | 4.774767E 03 | DYY | -1.065367E 02 | DZZ -6.148443E 03 |
| R | 6.577486E 06 | WT | 2.968374E 05 | F 3.363660E 01 |
| V | 7.785441E 03 | PTH | 3.298971E-02 | AZ 8.382824E 01 |
| ALT | 2.053569E 05 | LAT | -3.203166E 01 | LON 1.065492E 02 |
| VE | 7.381312E 03 | PTE | 3.479529E-02 | AZE 8.348891E 01 |
| ANG | 3.886641E 00 | NFA | 8.397083E 01 | IAC 9.215705E 00 |
| CPA | 4.829800E 01 | VPA | 4.829800E 01 | CYA -7.170870E-01 |
| VYA | -7.170870E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.820000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.168868E 06 | YYY | -1.114564E 05 | ZZZ -4.066203E 06 |
| DXX | 4.811069E 03 | DYY | -1.058208E 02 | DZZ -6.120073E 03 |
| R | 6.577509E 06 | WT | 2.968225E 05 | F 3.420828E 01 |
| V | 7.785427E 03 | PTH | 3.297211E-02 | AZ 8.361705E 01 |
| ALT | 2.053669E 05 | LAT | -3.199459E 01 | LON 1.069258E 02 |
| VE | 7.381306E 03 | PTE | 3.477749E-02 | AZE 8.326602E 01 |
| ANG | 3.887673E 00 | NFA | 8.379453E 01 | IAC 9.215668E 00 |
| CPA | 4.795891E 01 | VPA | 4.795891E 01 | CYA -7.115187E-01 |
| VYA | -7.115187E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.825000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.144722E 06 | YYY | -1.119837E 05 | ZZZ -4.096732E 06 |
| DXX | 4.847203E 03 | DYY | -1.051013E 02 | DZZ -6.091489E 03 |
| R | 6.577531E 06 | WT | 2.968076E 05 | F 3.477995E 01 |
| V | 7.785414E 03 | PTH | 3.295413E-02 | AZ 8.340626E 01 |
| ALT | 2.053765E 05 | LAT | -3.195627E 01 | LON 1.073021E 02 |
| VE | 7.381301E 03 | PTE | 3.475863E-02 | AZE 8.304353E 01 |
| ANG | 3.888737E 00 | NFA | 8.361857E 01 | IAC 9.215632E 00 |
| CPA | 4.761982E 01 | VPA | 4.761982E 01 | CYA -7.059265E-01 |
| VYA | -7.059265E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.830000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.120396E 06 | YYY | -1.125074E 05 | ZZZ -4.127117E 06 |
| DXX | 4.883167E 03 | DYY | -1.043779E 02 | DZZ -6.062693E 03 |
| R | 6.577554E 06 | WT | 2.967927E 05 | F 3.535163E 01 |
| V | 7.785400E 03 | PTH | 3.293491E-02 | AZ 8.319588E 01 |
| ALT | 2.053856E 05 | LAT | -3.191671E 01 | LON 1.076780E 02 |
| VE | 7.381296E 03 | PTE | 3.473825E-02 | AZE 8.282146E 01 |
| ANG | 3.889864E 00 | NFA | 8.344291E 01 | IAC 9.215597E 00 |
| CPA | 4.728074E 01 | VPA | 4.728074E 01 | CYA -7.003087E-01 |
| VYA | -7.003087E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.835000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.095891E 06 | YYY | -1.130274E 05 | ZZZ -4.157358E 06 |
| DXX | 4.918960E 03 | DYY | -1.036509E 02 | DZZ -6.033684E 03 |
| R | 6.577576E 06 | WT | 2.967779E 05 | F 3.592330E 01 |
| V | 7.785387E 03 | PTH | 3.291344E-02 | AZ 8.298592E 01 |
| ALT | 2.053943E 05 | LAT | -3.187592E 01 | LON 1.080536E 02 |
| VE | 7.381292E 03 | PTE | 3.471564E-02 | AZE 8.259983E 01 |
| ANG | 3.890984E 00 | NFA | 8.326758E 01 | IAC 9.215562E 00 |
| CPA | 4.694165E 01 | VPA | 4.694165E 01 | CYA -6.946652E-01 |
| VYA | -6.946652E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.840000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.071207E 06 | YYY | -1.135439E 05 | ZZZ -4.187454E 06 |
| DXX | 4.954581E 03 | DYY | -1.029202E 02 | DZZ -6.004465E 03 |
| R | 6.577598E 06 | WT | 2.967630E 05 | F 3.649498E 01 |
| V | 7.785375E 03 | PTH | 3.289224E-02 | AZ 8.277639E 01 |
| ALT | 2.054025E 05 | LAT | -3.183390E 01 | LON 1.084289E 02 |
| VE | 7.381289E 03 | PTE | 3.469363E-02 | AZE 8.237865E 01 |
| ANG | 3.892160E 00 | NFA | 8.309259E 01 | IAC 9.215529E 00 |
| CPA | 4.660257E 01 | VPA | 4.660257E 01 | CYA -6.889979E-01 |
| VYA | -6.889979E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.845000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.046345E 06 | YYY | -1.140566E 05 | ZZZ -4.217403E 06 |
| DXX | 4.990028E 03 | DYY | -1.021858E 02 | DZZ -5.975035E 03 |
| R | 6.577621E 06 | WT | 2.967481E 05 | F 3.706665E 01 |
| V | 7.785362E 03 | PTH | 3.286966E-02 | AZ 8.256730E 01 |
| ALT | 2.054104E 05 | LAT | -3.179065E 01 | LON 1.088038E 02 |
| VE | 7.381286E 03 | PTE | 3.466935E-02 | AZE 8.215792E 01 |
| ANG | 3.893355E 00 | NFA | 8.291792E 01 | IAC 9.215496E 00 |
| CPA | 4.626349E 01 | VPA | 4.626349E 01 | CYA -6.833041E-01 |
| VYA | -6.833041E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.850000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.021307E 06 | YYY | -1.145657E 05 | ZZZ -4.247204E 06 |
| DXX | 5.025301E 03 | DYY | -1.014477E 02 | DZZ -5.945397E 03 |
| R | 6.577643E 06 | WT | 2.967332E 05 | F 3.763833E 01 |
| V | 7.785350E 03 | PTH | 3.284678E-02 | AZ 8.235868E 01 |
| ALT | 2.054178E 05 | LAT | -3.174617E 01 | LON 1.091782E 02 |
| VE | 7.381284E 03 | PTE | 3.464459E-02 | AZE 8.193767E 01 |
| ANG | 3.894606E 00 | NFA | 8.274362E 01 | IAC 9.215464E 00 |
| CPA | 4.592441E 01 | VPA | 4.592441E 01 | CYA -6.775864E-01 |
| VYA | -6.775864E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.855000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.996093E 06 | YYY | -1.150711E 05 | ZZZ -4.276856E 06 |
| DXX | 5.060397E 03 | DYY | -1.007060E 02 | DZZ -5.915551E 03 |
| R | 6.577665E 06 | WT | 2.967183E 05 | F 3.821000E 01 |
| V | 7.785339E 03 | PTH | 3.282188E-02 | AZ 8.215052E 01 |
| ALT | 2.054248E 05 | LAT | -3.170048E 01 | LON 1.095524E 02 |
| VE | 7.381282E 03 | PTE | 3.461824E-02 | AZE 8.171790E 01 |
| ANG | 3.895856E 00 | NFA | 8.256966E 01 | IAC 9.215433E 00 |
| CPA | 4.558533E 01 | VPA | 4.558533E 01 | CYA -6.718439E-01 |
| VYA | -6.718439E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.860000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.970703E 06 | YYY | -1.155728E 05 | ZZZ -4.306359E 06 |
| DXX | 5.095316E 03 | DYY | -9.996074E 01 | DZZ -5.885498E 03 |
| R | 6.577688E 06 | WT | 2.967034E 05 | F 3.878168E 01 |
| V | 7.785327E 03 | PTH | 3.279629E-02 | AZ 8.194284E 01 |
| ALT | 2.054316E 05 | LAT | -3.165356E 01 | LON 1.099261E 02 |
| VE | 7.381282E 03 | PTE | 3.459124E-02 | AZE 8.149862E 01 |
| ANG | 3.897175E 00 | NFA | 8.239609E 01 | IAC 9.215403E 00 |
| CPA | 4.524626E 01 | VPA | 4.524626E 01 | CYA -6.660775E-01 |
| VYA | -6.660775E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.865000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.945140E 06 | YYY | -1.160707E 05 | ZZZ -4.335711E 06 |
| DXX | 5.130057E 03 | DYY | -9.921187E 01 | DZZ -5.855239E 03 |
| R | 6.577710E 06 | WT | 2.966885E 05 | F 3.935335E 01 |
| V | 7.785316E 03 | PTH | 3.276984E-02 | AZ 8.173566E 01 |
| ALT | 2.054377E 05 | LAT | -3.160543E 01 | LON 1.102994E 02 |
| VE | 7.381281E 03 | PTE | 3.456265E-02 | AZE 8.127986E 01 |
| ANG | 3.898488E 00 | NFA | 8.222288E 01 | IAC 9.215374E 00 |
| CPA | 4.490718E 01 | VPA | 4.490718E 01 | CYA -6.602863E-01 |
| VYA | -6.602863E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.870000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.919403E 06 | YYY | -1.165649E 05 | ZZZ -4.364911E 06 |
| DXX | 5.164618E 03 | DYY | -9.845946E 01 | DZZ -5.824775E 03 |
| R | 6.577732E 06 | WT | 2.966736E 05 | F 3.992503E 01 |
| V | 7.785306E 03 | PTH | 3.274134E-02 | AZ 8.152898E 01 |
| ALT | 2.054434E 05 | LAT | -3.155608E 01 | LON 1.106723E 02 |
| VE | 7.381282E 03 | PTE | 3.453348E-02 | AZE 8.106161E 01 |
| ANG | 3.899856E 00 | NFA | 8.205007E 01 | IAC 9.215345E 00 |
| CPA | 4.456811E 01 | VPA | 4.456811E 01 | CYA -6.544721E-01 |
| VYA | -6.544721E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.875000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.893494E 06 | YYY | -1.170553E 05 | ZZZ -4.393958E 06 |
| DXX | 5.198999E 03 | DYY | -9.770351E 01 | DZZ -5.794108E 03 |
| R | 6.577754E 06 | WT | 2.966587E 05 | F 4.049670E 01 |
| V | 7.785295E 03 | PTH | 3.271318E-02 | AZ 8.132281E 01 |
| ALT | 2.054488E 05 | LAT | -3.150553E 01 | LON 1.110447E 02 |
| VE | 7.381283E 03 | PTE | 3.450380E-02 | AZE 8.084389E 01 |
| ANG | 3.901268E 00 | NFA | 8.187763E 01 | IAC 9.215318E 00 |
| CPA | 4.422904E 01 | VPA | 4.422904E 01 | CYA -6.486332E-01 |
| VYA | -6.486332E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.880000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.867413E 06 | YYY | -1.175419E 05 | ZZZ -4.422852E 06 |
| DXX | 5.233197E 03 | DYY | -9.694406E 01 | DZZ -5.763239E 03 |
| R | 6.577777E 06 | WT | 2.966438E 05 | F 4.106838E 01 |
| V | 7.785285E 03 | PTH | 3.268365E-02 | AZ 8.111717E 01 |
| ALT | 2.054537E 05 | LAT | -3.145377E 01 | LON 1.114168E 02 |
| VE | 7.381285E 03 | PTE | 3.447267E-02 | AZE 8.062672E 01 |
| ANG | 3.902692E 00 | NFA | 8.170561E 01 | IAC 9.215291E 00 |
| CPA | 4.388997E 01 | VPA | 4.388997E 01 | CYA -6.427712E-01 |
| VYA | -6.427712E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.885000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.841162E 06 | YYY | -1.180247E 05 | ZZZ -4.451590E 06 |
| DXX | 5.267212E 03 | DYY | -9.618112E 01 | DZZ -5.732167E 03 |
| R | 6.577799E 06 | WT | 2.966289E 05 | F 4.164005E 01 |
| V | 7.785275E 03 | PTH | 3.265230E-02 | AZ 8.091207E 01 |
| ALT | 2.054584E 05 | LAT | -3.140082E 01 | LON 1.117884E 02 |
| VE | 7.381287E 03 | PTE | 3.443905E-02 | AZE 8.041010E 01 |
| ANG | 3.904153E 00 | NFA | 8.153400E 01 | IAC 9.215265E 00 |
| CPA | 4.355090E 01 | VPA | 4.355090E 01 | CYA -6.368861E-01 |
| VYA | -6.368861E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.890000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.814742E 06 | YYY | -1.185037E 05 | ZZZ -4.480173E 06 |
| DXX | 5.301043E 03 | DYY | -9.541473E 01 | DZZ -5.700896E 03 |
| R | 6.577821E 06 | WT | 2.966140E 05 | F 4.221173E 01 |
| V | 7.785266E 03 | PTH | 3.262048E-02 | AZ 8.070751E 01 |
| ALT | 2.054627E 05 | LAT | -3.134666E 01 | LON 1.121595E 02 |
| VE | 7.381290E 03 | PTE | 3.440615E-02 | AZE 8.019405E 01 |
| ANG | 3.905645E 00 | NFA | 8.136281E 01 | IAC 9.215239E 00 |
| CPA | 4.321183E 01 | VPA | 4.321183E 01 | CYA -6.309780E-01 |
| VYA | -6.309780E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.895000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.788152E 06 | YYY | -1.189789E 05 | ZZZ -4.508599E 06 |
| DXX | 5.334688E 03 | DYY | -9.464491E 01 | DZZ -5.669425E 03 |
| R | 6.577843E 06 | WT | 2.965991E 05 | F 4.278340E 01 |
| V | 7.785257E 03 | PTH | 3.258714E-02 | AZ 8.050351E 01 |
| ALT | 2.054662E 05 | LAT | -3.129132E 01 | LON 1.125302E 02 |
| VE | 7.381293E 03 | PTE | 3.437083E-02 | AZE 7.997857E 01 |
| ANG | 3.907162E 00 | NFA | 8.119204E 01 | IAC 9.215215E 00 |
| CPA | 4.287276E 01 | VPA | 4.287276E 01 | CYA -6.250468E-01 |
| VYA | -6.250468E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.900000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.761395E 06 | YYY | -1.194502E 05 | ZZZ -4.536867E 06 |
| DXX | 5.368146E 03 | DYY | -9.387168E 01 | DZZ -5.637756E 03 |
| R | 6.577865E 06 | WT | 2.965843E 05 | F 4.335508E 01 |
| V | 7.785248E 03 | PTH | 3.255449E-02 | AZ 8.030009E 01 |
| ALT | 2.054697E 05 | LAT | -3.123478E 01 | LON 1.129004E 02 |
| VE | 7.381298E 03 | PTE | 3.433600E-02 | AZE 7.976368E 01 |
| ANG | 3.908721E 00 | NFA | 8.102169E 01 | IAC 9.215191E 00 |
| CPA | 4.253370E 01 | VPA | 4.253370E 01 | CYA -6.190918E-01 |
| VYA | -6.190918E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.905000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.734471E 06 | YYY | -1.199176E 05 | ZZZ -4.564976E 06 |
| DXX | 5.401417E 03 | DYY | -9.309506E 01 | DZZ -5.605889E 03 |
| R | 6.577887E 06 | WT | 2.965694E 05 | F 4.392675E 01 |
| V | 7.785240E 03 | PTH | 3.251800E-02 | AZ 8.009724E 01 |
| ALT | 2.054726E 05 | LAT | -3.117706E 01 | LON 1.132701E 02 |
| VE | 7.381302E 03 | PTE | 3.429764E-02 | AZE 7.954939E 01 |
| ANG | 3.910299E 00 | NFA | 8.085179E 01 | IAC 9.215168E 00 |
| CPA | 4.219463E 01 | VPA | 4.219463E 01 | CYA -6.131145E-01 |
| VYA | -6.131145E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.910000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.707381E 06 | YYY | -1.203811E 05 | ZZZ -4.592926E 06 |
| DXX | 5.434498E 03 | DYY | -9.231509E 01 | DZZ -5.573827E 03 |
| R | 6.577909E 06 | WT | 2.965545E 05 | F 4.449843E 01 |
| V | 7.785232E 03 | PTH | 3.248248E-02 | AZ 7.989498E 01 |
| ALT | 2.054752E 05 | LAT | -3.111816E 01 | LON 1.136394E 02 |
| VE | 7.381308E 03 | PTE | 3.425986E-02 | AZE 7.933571E 01 |
| ANG | 3.911920E 00 | NFA | 8.068236E 01 | IAC 9.215146E 00 |
| CPA | 4.185557E 01 | VPA | 4.185557E 01 | CYA -6.071159E-01 |
| VYA | -6.071159E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.915000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.680126E 06 | YYY | -1.208407E 05 | ZZZ -4.620714E 06 |
| DXX | 5.467396E 03 | DYY | -9.153188E 01 | DZZ -5.541576E 03 |
| R | 6.577932E 06 | WT | 2.965396E 05 | F 1.400000E 02 |
| V | 7.785233E 03 | PTH | 3.244225E-02 | AZ 7.969333E 01 |
| ALT | 2.054774E 05 | LAT | -3.105809E 01 | LON 1.140082E 02 |
| VE | 7.381323E 03 | PTE | 3.421784E-02 | AZE 7.912265E 01 |
| ANG | 3.913553E 00 | NFA | 8.051338E 01 | IAC 9.215336E 00 |
| CPA | 4.151650E 01 | VPA | 4.151650E 01 | CYA -6.010942E-01 |
| VYA | -6.010942E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.920000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.652707E 06 | YYY | -1.212964E 05 | ZZZ -4.648341E 06 |
| DXX | 5.500107E 03 | DYY | -9.074543E 01 | DZZ -5.509135E 03 |
| R | 6.577954E 06 | WT | 2.965247E 05 | F 1.400000E 02 |
| V | 7.785241E 03 | PTH | 3.239799E-02 | AZ 7.949228E 01 |
| ALT | 2.054792E 05 | LAT | -3.099684E 01 | LON 1.143764E 02 |
| VE | 7.381345E 03 | PTE | 3.417120E-02 | AZE 7.891022E 01 |
| ANG | 3.915223E 00 | NFA | 8.034488E 01 | IAC 9.215315E 00 |
| CPA | 4.117744E 01 | VPA | 4.117744E 01 | CYA -5.950503E-01 |
| VYA | -5.950503E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.925000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.625126E 06 | YYY | -1.217482E 05 | ZZZ -4.675805E 06 |
| DXX | 5.532626E 03 | DYY | -8.995569E 01 | DZZ -5.476502E 03 |
| R | 6.577976E 06 | WT | 2.965098E 05 | F 1.400000E 02 |
| V | 7.785250E 03 | PTH | 3.235387E-02 | AZ 7.929186E 01 |
| ALT | 2.054806E 05 | LAT | -3.093442E 01 | LON 1.147442E 02 |
| VE | 7.381367E 03 | PTE | 3.412387E-02 | AZE 7.869844E 01 |
| ANG | 3.916929E 00 | NFA | 8.017685E 01 | IAC 9.215294E 00 |
| CPA | 4.083837E 01 | VPA | 4.083837E 01 | CYA -5.889851E-01 |
| VYA | -5.889851E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.930000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.597382E 06 | YYY | -1.221960E 05 | ZZZ -4.703106E 06 |
| DXX | 5.564951E 03 | DYY | -8.916270E 01 | DZZ -5.443677E 03 |
| R | 6.577998E 06 | WT | 2.964949E 05 | F 1.400000E 02 |
| V | 7.785258E 03 | PTH | 3.231016E-02 | AZ 7.909207E 01 |
| ALT | 2.054817E 05 | LAT | -3.087084E 01 | LON 1.151115E 02 |
| VE | 7.381391E 03 | PTE | 3.407777E-02 | AZE 7.848731E 01 |
| ANG | 3.918666E 00 | NFA | 8.000930E 01 | IAC 9.215273E 00 |
| CPA | 4.049931E 01 | VPA | 4.049931E 01 | CYA -5.828977E-01 |
| VYA | -5.828977E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.935000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.569476E 06 | YYY | -1.226398E 05 | ZZZ -4.730242E 06 |
| DXX | 5.597082E 03 | DYY | -8.836647E 01 | DZZ -5.410661E 03 |
| R | 6.578019E 06 | WT | 2.964800E 05 | F 1.400000E 02 |
| V | 7.785268E 03 | PTH | 3.226652E-02 | AZ 7.889292E 01 |
| ALT | 2.054823E 05 | LAT | -3.080610E 01 | LON 1.154782E 02 |
| VE | 7.381414E 03 | PTE | 3.403203E-02 | AZE 7.827684E 01 |
| ANG | 3.920415E 00 | NFA | 7.984224E 01 | IAC 9.215254E 00 |
| CPA | 4.016024E 01 | VPA | 4.016024E 01 | CYA -5.767890E-01 |
| VYA | -5.767890E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.940000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.541411E 06 | YYY | -1.230796E 05 | ZZZ -4.757212E 06 |
| DXX | 5.629016E 03 | DYY | -8.756703E 01 | DZZ -5.377457E 03 |
| R | 6.578041E 06 | WT | 2.964651E 05 | F 1.400000E 02 |
| V | 7.785277E 03 | PTH | 3.222438E-02 | AZ 7.869442E 01 |
| ALT | 2.054824E 05 | LAT | -3.074021E 01 | LON 1.158444E 02 |
| VE | 7.381439E 03 | PTE | 3.398723E-02 | AZE 7.806704E 01 |
| ANG | 3.922200E 00 | NFA | 7.967569E 01 | IAC 9.215236E 00 |
| CPA | 3.982118E 01 | VPA | 3.982118E 01 | CYA -5.706597E-01 |
| VYA | -5.706597E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.945000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.513187E 06 | YYY | -1.235155E 05 | ZZZ -4.784016E 06 |
| DXX | 5.660754E 03 | DYY | -8.676441E 01 | DZZ -5.344064E 03 |
| R | 6.578063E 06 | WT | 2.964502E 05 | F 1.400000E 02 |
| V | 7.785286E 03 | PTH | 3.218142E-02 | AZ 7.849658E 01 |
| ALT | 2.054823E 05 | LAT | -3.067317E 01 | LON 1.162101E 02 |
| VE | 7.381464E 03 | PTE | 3.394177E-02 | AZE 7.785792E 01 |
| ANG | 3.924009E 00 | NFA | 7.950963E 01 | IAC 9.215218E 00 |
| CPA | 3.948213E 01 | VPA | 3.948213E 01 | CYA -5.645092E-01 |
| VYA | -5.645092E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.950000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.484804E 06 | YYY | -1.239473E 05 | ZZZ -4.810652E 06 |
| DXX | 5.692293E 03 | DYY | -8.595863E 01 | DZZ -5.310484E 03 |
| R | 6.578085E 06 | WT | 2.964353E 05 | F 1.400000E 02 |
| V | 7.785296E 03 | PTH | 3.213907E-02 | AZ 7.829941E 01 |
| ALT | 2.054818E 05 | LAT | -3.060498E 01 | LON 1.165752E 02 |
| VE | 7.381489E 03 | PTE | 3.389704E-02 | AZE 7.764950E 01 |
| ANG | 3.925849E 00 | NFA | 7.934408E 01 | IAC 9.215201E 00 |
| CPA | 3.914307E 01 | VPA | 3.914307E 01 | CYA -5.583372E-01 |
| VYA | -5.583372E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.955000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.456264E 06 | YYY | -1.243751E 05 | ZZZ -4.837120E 06 |
| DXX | 5.723633E 03 | DYY | -8.514972E 01 | DZZ -5.276718E 03 |
| R | 6.578107E 06 | WT | 2.964204E 05 | F 1.400000E 02 |
| V | 7.785306E 03 | PTH | 3.209707E-02 | AZ 7.810291E 01 |
| ALT | 2.054809E 05 | LAT | -3.053565E 01 | LON 1.169398E 02 |
| VE | 7.381514E 03 | PTE | 3.385316E-02 | AZE 7.744177E 01 |
| ANG | 3.927725E 00 | NFA | 7.917906E 01 | IAC 9.215185E 00 |
| CPA | 3.880402E 01 | VPA | 3.880402E 01 | CYA -5.521457E-01 |
| VYA | -5.521457E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.960000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.427568E 06 | YYY | -1.247988E 05 | ZZZ -4.863419E 06 |
| DXX | 5.754773E 03 | DYY | -8.433771E 01 | DZZ -5.242768E 03 |
| R | 6.578129E 06 | WT | 2.964055E 05 | F 1.400000E 02 |
| V | 7.785316E 03 | PTH | 3.205588E-02 | AZ 7.790711E 01 |
| ALT | 2.054797E 05 | LAT | -3.046519E 01 | LON 1.173038E 02 |
| VE | 7.381541E 03 | PTE | 3.380951E-02 | AZE 7.723476E 01 |
| ANG | 3.929619E 00 | NFA | 7.901456E 01 | IAC 9.215169E 00 |
| CPA | 3.846496E 01 | VPA | 3.846496E 01 | CYA -5.459327E-01 |
| VYA | -5.459327E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME 8.965000E 03 | | |
|----------------------|---------------|-----|--------------------------|-----|---------------|
| XXX | -4.398717E 06 | YYY | -1.252184E 05 | ZZZ | -4.889548E 06 |
| DXX | 5.785712E 03 | DYY | -8.352261E 01 | DZZ | -5.208634E 03 |
| R | 6.578150E 06 | WT | 2.963906E 05 | F | 1.400000E 02 |
| V | 7.785326E 03 | PTH | 3.201484E-02 | AZ | 7.771200E 01 |
| ALT | 2.054779E 05 | LAT | -3.039359E 01 | LON | 1.176673E 02 |
| VE | 7.381567E 03 | PTE | 3.376628E-02 | AZE | 7.702847E 01 |
| ANG | 3.931544E 00 | NFA | 7.885060E 01 | IAC | 9.215154E 00 |
| CPA | 3.812591E 01 | VPA | 3.812591E 01 | CYA | -5.397002E-01 |
| VYA | -5.397002E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME 8.970000E 03 | | |
|----------------------|---------------|-----|--------------------------|-----|---------------|
| XXX | -4.369711E 06 | YYY | -1.256340E 05 | ZZZ | -4.915505E 06 |
| DXX | 5.816448E 03 | DYY | -8.270447E 01 | DZZ | -5.174318E 03 |
| R | 6.578172E 06 | WT | 2.963758E 05 | F | 1.400000E 02 |
| V | 7.785337E 03 | PTH | 3.197399E-02 | AZ | 7.751760E 01 |
| ALT | 2.054760E 05 | LAT | -3.032087E 01 | LON | 1.180301E 02 |
| VE | 7.381595E 03 | PTE | 3.372284E-02 | AZE | 7.682291E 01 |
| ANG | 3.933498E 00 | NFA | 7.868717E 01 | IAC | 9.215140E 00 |
| CPA | 3.778686E 01 | VPA | 3.778686E 01 | CYA | -5.334472E-01 |
| VYA | -5.334472E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME 8.975000E 03 | | |
|----------------------|---------------|-----|--------------------------|-----|---------------|
| XXX | -4.340552E 06 | YYY | -1.260455E 05 | ZZZ | -4.941291E 06 |
| DXX | 5.846980E 03 | DYY | -8.188329E 01 | DZZ | -5.139820E 03 |
| R | 6.578194E 06 | WT | 2.963609E 05 | F | 1.400000E 02 |
| V | 7.785347E 03 | PTH | 3.193397E-02 | AZ | 7.732392E 01 |
| ALT | 2.054737E 05 | LAT | -3.024703E 01 | LON | 1.183925E 02 |
| VE | 7.381622E 03 | PTE | 3.368091E-02 | AZE | 7.661809E 01 |
| ANG | 3.935470E 00 | NFA | 7.852430E 01 | IAC | 9.215127E 00 |
| CPA | 3.744781E 01 | VPA | 3.744781E 01 | CYA | -5.271753E-01 |
| VYA | -5.271753E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.980000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.311242E 06 | YYY | -1.264528E 05 | ZZZ -4.966903E 06 |
| DXX | 5.877308E 03 | DYY | -8.105912E 01 | DZZ -5.105143E 03 |
| R | 6.578216E 06 | WT | 2.963460E 05 | F 1.400000E 02 |
| V | 7.785358E 03 | PTH | 3.189203E-02 | AZ 7.713095E 01 |
| ALT | 2.054710E 05 | LAT | -3.017207E 01 | LON 1.187542E 02 |
| VE | 7.381650E 03 | PTE | 3.363623E-02 | AZE 7.641401E 01 |
| ANG | 3.937467E 00 | NFA | 7.836195E 01 | IAC 9.215114E 00 |
| CPA | 3.710877E 01 | VPA | 3.710877E 01 | CYA -5.208822E-01 |
| VYA | -5.208822E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.985000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.281780E 06 | YYY | -1.268560E 05 | ZZZ -4.992342E 06 |
| DXX | 5.907430E 03 | DYY | -8.023198E 01 | DZZ -5.070287E 03 |
| R | 6.578237E 06 | WT | 2.963311E 05 | F 1.400000E 02 |
| V | 7.785369E 03 | PTH | 3.185351E-02 | AZ 7.693872E 01 |
| ALT | 2.054680E 05 | LAT | -3.009600E 01 | LON 1.191153E 02 |
| VE | 7.381679E 03 | PTE | 3.359538E-02 | AZE 7.621070E 01 |
| ANG | 3.939518E 00 | NFA | 7.820019E 01 | IAC 9.215102E 00 |
| CPA | 3.676972E 01 | VPA | 3.676972E 01 | CYA -5.145702E-01 |
| VYA | -5.145702E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.990000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.252168E 06 | YYY | -1.272551E 05 | ZZZ -5.017606E 06 |
| DXX | 5.937345E 03 | DYY | -7.940189E 01 | DZZ -5.035254E 03 |
| R | 6.578259E 06 | WT | 2.963162E 05 | F 1.400000E 02 |
| V | 7.785381E 03 | PTH | 3.181404E-02 | AZ 7.674723E 01 |
| ALT | 2.054646E 05 | LAT | -3.001883E 01 | LON 1.194759E 02 |
| VE | 7.381708E 03 | PTE | 3.355330E-02 | AZE 7.600815E 01 |
| ANG | 3.941549E 00 | NFA | 7.803899E 01 | IAC 9.215091E 00 |
| CPA | 3.643068E 01 | VPA | 3.643068E 01 | CYA -5.082395E-01 |
| VYA | -5.082395E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.995000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.222407E 06 | YYY | -1.276501E 05 | ZZZ -5.042694E 06 |
| DXX | 5.967053E 03 | DYY | -7.856888E 01 | DZZ -5.000045E 03 |
| R | 6.578280E 06 | WT | 2.963013E 05 | F 1.400000E 02 |
| V | 7.785392E 03 | PTH | 3.177429E-02 | AZ 7.655649E 01 |
| ALT | 2.054608E 05 | LAT | -2.994055E 01 | LON 1.198358E 02 |
| VE | 7.381737E 03 | PTE | 3.351194E-02 | AZE 7.580637E 01 |
| ANG | 3.943635E 00 | NFA | 7.787837E 01 | IAC 9.215081E 00 |
| CPA | 3.609164E 01 | VPA | 3.609164E 01 | CYA -5.018900E-01 |
| VYA | -5.018900E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.000000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.192497E 06 | YYY | -1.280408E 05 | ZZZ -5.067606E 06 |
| DXX | 5.996551E 03 | DYY | -7.773298E 01 | DZZ -4.964660E 03 |
| R | 6.578302E 06 | WT | 2.962864E 05 | F 1.400000E 02 |
| V | 7.785404E 03 | PTH | 3.173508E-02 | AZ 7.636650E 01 |
| ALT | 2.054567E 05 | LAT | -2.986118E 01 | LON 1.201952E 02 |
| VE | 7.381767E 03 | PTE | 3.347051E-02 | AZE 7.560538E 01 |
| ANG | 3.945745E 00 | NFA | 7.771833E 01 | IAC 9.215071E 00 |
| CPA | 3.575260E 01 | VPA | 3.575260E 01 | CYA -4.955217E-01 |
| VYA | -4.955217E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.005000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.162441E 06 | YYY | -1.284274E 05 | ZZZ -5.092340E 06 |
| DXX | 6.025840E 03 | DYY | -7.689421E 01 | DZZ -4.929102E 03 |
| R | 6.578324E 06 | WT | 2.962715E 05 | F 1.400000E 02 |
| V | 7.785416E 03 | PTH | 3.169574E-02 | AZ 7.617728E 01 |
| ALT | 2.054523E 05 | LAT | -2.978072E 01 | LON 1.205539E 02 |
| VE | 7.381798E 03 | PTE | 3.342900E-02 | AZE 7.540517E 01 |
| ANG | 3.947872E 00 | NFA | 7.755887E 01 | IAC 9.215062E 00 |
| CPA | 3.541356E 01 | VPA | 3.541356E 01 | CYA -4.891338E-01 |
| VYA | -4.891338E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.010000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.132239E 06 | YYY | -1.288098E 05 | ZZZ -5.116897E 06 |
| DXX | 6.054918E 03 | DYY | -7.605261E 01 | DZZ -4.893371E 03 |
| R | 6.578345E 06 | WT | 2.962566E 05 | F 1.400000E 02 |
| V | 7.785428E 03 | PTH | 3.165879E-02 | AZ 7.598883E 01 |
| ALT | 2.054476E 05 | LAT | -2.969917E 01 | LON 1.209121E 02 |
| VE | 7.381828E 03 | PTE | 3.338959E-02 | AZE 7.520577E 01 |
| ANG | 3.950023E 00 | NFA | 7.740001E 01 | IAC 9.215053E 00 |
| CPA | 3.507453E 01 | VPA | 3.507453E 01 | CYA -4.827287E-01 |
| VYA | -4.827287E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.015000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.101893E 06 | YYY | -1.291879E 05 | ZZZ -5.141274E 06 |
| DXX | 6.083784E 03 | DYY | -7.520819E 01 | DZZ -4.857469E 03 |
| R | 6.578367E 06 | WT | 2.962417E 05 | F 1.400000E 02 |
| V | 7.785441E 03 | PTH | 3.161924E-02 | AZ 7.580116E 01 |
| ALT | 2.054424E 05 | LAT | -2.961655E 01 | LON 1.212696E 02 |
| VE | 7.381860E 03 | PTE | 3.334764E-02 | AZE 7.500717E 01 |
| ANG | 3.952204E 00 | NFA | 7.724176E 01 | IAC 9.215046E 00 |
| CPA | 3.473549E 01 | VPA | 3.473549E 01 | CYA -4.763058E-01 |
| VYA | -4.763058E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.020000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.071399E 06 | YYY | -1.295619E 05 | ZZZ -5.165473E 06 |
| DXX | 6.114002E 03 | DYY | -7.437663E 01 | DZZ -4.822472E 03 |
| R | 6.578388E 06 | WT | 2.962268E 05 | F 1.825100E 04 |
| V | 7.787348E 03 | PTH | 3.069087E-02 | AZ 7.561426E 01 |
| ALT | 2.054368E 05 | LAT | -2.953284E 01 | LON 1.216265E 02 |
| VE | 7.383786E 03 | PTE | 3.236829E-02 | AZE 7.480958E 01 |
| ANG | 3.954309E 00 | NFA | 7.708686E 01 | IAC 9.274990E 00 |
| CPA | 3.439554E 01 | VPA | 3.439554E 01 | CYA -4.698444E-01 |
| VYA | -4.698444E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.025000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.040752E 06 | YYY | -1.299317E 05 | ZZZ -5.189499E 06 |
| DXX | 6.144920E 03 | DYY | -7.355109E 01 | DZZ -4.787917E 03 |
| R | 6.578408E 06 | WT | 2.962119E 05 | F 1.825100E 04 |
| V | 7.790353E 03 | PTH | 2.945946E-02 | AZ 7.542809E 01 |
| ALT | 2.054301E 05 | LAT | -2.944804E 01 | LON 1.219829E 02 |
| VE | 7.386810E 03 | PTE | 3.106912E-02 | AZE 7.461287E 01 |
| ANG | 3.956395E 00 | NFA | 7.693429E 01 | IAC 9.275005E 00 |
| CPA | 3.405517E 01 | VPA | 3.405517E 01 | CYA -4.633592E-01 |
| VYA | -4.633592E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.027000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.028450E 06 | YYY | -1.300785E 05 | ZZZ -5.199061E 06 |
| DXX | 6.157229E 03 | DYY | -7.322001E 01 | DZZ -4.774044E 03 |
| R | 6.578416E 06 | WT | 2.962060E 05 | F 1.825100E 04 |
| V | 7.791555E 03 | PTH | 2.904115E-02 | AZ 7.535383E 01 |
| ALT | 2.054271E 05 | LAT | -2.941381E 01 | LON 1.221253E 02 |
| VE | 7.388020E 03 | PTE | 3.062739E-02 | AZE 7.453440E 01 |
| ANG | 3.957248E 00 | NFA | 7.687344E 01 | IAC 9.275011E 00 |
| CPA | 3.391905E 01 | VPA | 3.391905E 01 | CYA -4.607594E-01 |
| VYA | -4.607594E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

| S-IVB STAGE AT OPERATING THRUST LEVEL | | FLIGHT TIME | | 9.027000E 03 |
|---------------------------------------|---------------|-------------|---------------|-------------------|
| GEOCENTRIC REFERENCE | | | | |
| XXX | -4.028450E 06 | YYY | -1.300785E 05 | ZZZ -5.199061E 06 |
| DXX | 6.157229E 03 | DYY | -7.322001E 01 | DZZ -4.774044E 03 |
| R | 6.578416E 06 | WT | 2.962060E 05 | F 2.073030E 05 |
| V | 7.791555E 03 | PTH | 2.904115E-02 | AZ 7.535383E 01 |
| ALT | 2.054271E 05 | LAT | -2.941381E 01 | LON 1.221253E 02 |
| VE | 7.388020E 03 | PTE | 3.062739E-02 | AZE 7.453440E 01 |
| ANG | 3.957248E 00 | NFA | 7.687344E 01 | IAC 1.186069E 01 |
| CPA | 3.391905E 01 | VPA | 3.391905E 01 | CYA -4.607594E-01 |
| VYA | -4.607594E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.029600E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.012403E 06 | YYY | -1.302684E 05 | ZZZ -5.211461E 06 |
| DXX | 6.186731E 03 | DYY | -7.292010E 01 | DZZ -4.765049E 03 |
| R | 6.578425E 06 | WT | 2.949457E 05 | F 1.777494E 05 |
| V | 7.809395E 03 | PTH | 2.086970E-02 | AZ 7.525736E 01 |
| ALT | 2.054215E 05 | LAT | -2.936900E 01 | LON 1.223106E 02 |
| VE | 7.405868E 03 | PTE | 2.200684E-02 | AZE 7.443428E 01 |
| ANG | 3.811095E 00 | NFA | 7.635923E 01 | IAC 1.126589E 01 |
| CPA | 3.391905E 01 | VPA | 3.388401E 01 | CYA -4.607594E-01 |
| VYA | -4.607594E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.030000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.009927E 06 | YYY | -1.302976E 05 | ZZZ -5.213367E 06 |
| DXX | 6.190942E 03 | DYY | -7.287078E 01 | DZZ -4.763448E 03 |
| R | 6.578426E 06 | WT | 2.947808E 05 | F 1.777494E 05 |
| V | 7.811755E 03 | PTH | 1.992006E-02 | AZ 7.524252E 01 |
| ALT | 2.054204E 05 | LAT | -2.936207E 01 | LON 1.223391E 02 |
| VE | 7.408229E 03 | PTE | 2.100511E-02 | AZE 7.441883E 01 |
| ANG | 3.775652E 00 | NFA | 7.622795E 01 | IAC 1.126414E 01 |
| CPA | 3.391905E 01 | VPA | 3.389227E 01 | CYA -4.607594E-01 |
| VYA | -4.607594E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.033000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.991307E 06 | YYY | -1.305156E 05 | ZZZ -5.227640E 06 |
| DXX | 6.222512E 03 | DYY | -7.250072E 01 | DZZ -4.751436E 03 |
| R | 6.578433E 06 | WT | 2.935439E 05 | F 1.777494E 05 |
| V | 7.829499E 03 | PTH | 1.368602E-02 | AZ 7.513124E 01 |
| ALT | 2.054107E 05 | LAT | -2.930982E 01 | LON 1.225532E 02 |
| VE | 7.425984E 03 | PTE | 1.442977E-02 | AZE 7.430304E 01 |
| ANG | 3.535149E 00 | NFA | 7.526410E 01 | IAC 1.123249E 01 |
| CPA | 3.353978E 01 | VPA | 3.392956E 01 | CYA -1.460759E 00 |
| VYA | -4.607594E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.035000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.978841E 06 | YYY | -1.306603E 05 | ZZZ -5.237134E 06 |
| DXX | 6.243591E 03 | DYY | -7.217394E 01 | DZZ -4.743354E 03 |
| R | 6.578436E 06 | WT | 2.927194E 05 | F 1.777494E 05 |
| V | 7.841368E 03 | PTH | 9.727522E-03 | AZ 7.505765E 01 |
| ALT | 2.054026E 05 | LAT | -2.927472E 01 | LON 1.226960E 02 |
| VE | 7.437858E 03 | PTE | 1.025518E-02 | AZE 7.422649E 01 |
| ANG | 3.316344E 00 | NFA | 9.374911E 01 | IAC 1.128588E 01 |
| CPA | 3.480803E 01 | VPA | 3.389837E 01 | CYA -2.461517E 00 |
| VYA | -1.577740E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.040000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.947492E 06 | YYY | -1.310230E 05 | ZZZ -5.260802E 06 |
| DXX | 6.295835E 03 | DYY | -7.288343E 01 | DZZ -4.723666E 03 |
| R | 6.578442E 06 | WT | 2.906579E 05 | F 1.777494E 05 |
| V | 7.871205E 03 | PTH | 7.809624E-03 | AZ 7.486275E 01 |
| ALT | 2.053797E 05 | LAT | -2.918594E 01 | LON 1.230538E 02 |
| VE | 7.467732E 03 | PTE | 8.231640E-03 | AZE 7.402364E 01 |
| ANG | 2.289130E 00 | NFA | 1.171922E 02 | IAC 1.116870E 01 |
| CPA | 3.458076E 01 | VPA | 3.482743E 01 | CYA -2.224382E 00 |
| VYA | -2.416879E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.045000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.915882E 06 | YYY | -1.313879E 05 | ZZZ -5.284370E 06 |
| DXX | 6.348178E 03 | DYY | -7.308943E 01 | DZZ -4.703767E 03 |
| R | 6.578447E 06 | WT | 2.885965E 05 | F 1.777494E 05 |
| V | 7.901274E 03 | PTH | 8.083030E-03 | AZ 7.467169E 01 |
| ALT | 2.053564E 05 | LAT | -2.909571E 01 | LON 1.234123E 02 |
| VE | 7.497831E 03 | PTE | 8.518459E-03 | AZE 7.382490E 01 |
| ANG | 2.244131E 00 | NFA | 1.076008E 02 | IAC 1.120456E 01 |
| CPA | 3.436223E 01 | VPA | 3.438096E 01 | CYA -2.024596E 00 |
| VYA | -2.056504E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.050000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.884011E 06 | YYY | -1.317539E 05 | ZZZ -5.307839E 06 |
| DXX | 6.400523E 03 | DYY | -7.328385E 01 | DZZ -4.683760E 03 |
| R | 6.578454E 06 | WT | 2.865351E 05 | F 1.777494E 05 |
| V | 7.931561E 03 | PTH | 1.163991E-02 | AZ 7.448089E 01 |
| ALT | 2.053340E 05 | LAT | -2.900402E 01 | LON 1.237715E 02 |
| VE | 7.528148E 03 | PTE | 1.226366E-02 | AZE 7.362651E 01 |
| ANG | 2.038193E 00 | NFA | 1.036978E 02 | IAC 1.121594E 01 |
| CPA | 3.413952E 01 | VPA | 3.419859E 01 | CYA -1.817124E 00 |
| VYA | -1.867275E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.055000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.851877E 06 | YYY | -1.321205E 05 | ZZZ -5.331208E 06 |
| DXX | 6.452900E 03 | DYY | -7.335351E 01 | DZZ -4.663608E 03 |
| R | 6.578464E 06 | WT | 2.844737E 05 | F 1.777494E 05 |
| V | 7.962068E 03 | PTH | 1.813345E-02 | AZ 7.429118E 01 |
| ALT | 2.053146E 05 | LAT | -2.891087E 01 | LON 1.241315E 02 |
| VE | 7.558683E 03 | PTE | 1.910167E-02 | AZE 7.342933E 01 |
| ANG | 1.890697E 00 | NFA | 9.825554E 01 | IAC 1.123118E 01 |
| CPA | 3.391459E 01 | VPA | 3.396826E 01 | CYA -1.612696E 00 |
| VYA | -1.661873E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.060000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.819481E 06 | YYY | -1.324873E 05 | ZZZ -5.354475E 06 |
| DXX | 6.505304E 03 | DYY | -7.332184E 01 | DZZ -4.643320E 03 |
| R | 6.578480E 06 | WT | 2.824123E 05 | F 1.777494E 05 |
| V | 7.992795E 03 | PTH | 2.764044E-02 | AZ 7.410239E 01 |
| ALT | 2.053004E 05 | LAT | -2.881626E 01 | LON 1.244923E 02 |
| VE | 7.589436E 03 | PTE | 2.910946E-02 | AZE 7.323319E 01 |
| ANG | 1.758306E 00 | NFA | 9.200560E 01 | IAC 1.124666E 01 |
| CPA | 3.369736E 01 | VPA | 3.374453E 01 | CYA -1.405777E 00 |
| VYA | -1.456873E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.065000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.786824E 06 | YYY | -1.328536E 05 | ZZZ -5.377641E 06 |
| DXX | 6.557734E 03 | DYY | -7.318027E 01 | DZZ -4.622900E 03 |
| R | 6.578503E 06 | WT | 2.803509E 05 | F 1.777494E 05 |
| V | 8.023742E 03 | PTH | 4.020027E-02 | AZ 7.391459E 01 |
| ALT | 2.052937E 05 | LAT | -2.872018E 01 | LON 1.248539E 02 |
| VE | 7.620407E 03 | PTE | 4.232828E-02 | AZE 7.303815E 01 |
| ANG | 1.632038E 00 | NFA | 8.461599E 01 | IAC 1.125992E 01 |
| CPA | 3.349127E 01 | VPA | 3.354122E 01 | CYA -1.196883E 00 |
| VYA | -1.246261E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.070000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.753904E 06 | YYY | -1.332189E 05 | ZZZ -5.400704E 06 |
| DXX | 6.610188E 03 | DYY | -7.292776E 01 | DZZ -4.602354E 03 |
| R | 6.578537E 06 | WT | 2.782895E 05 | F 1.777494E 05 |
| V | 8.054909E 03 | PTH | 5.585388E-02 | AZ 7.372779E 01 |
| ALT | 2.052963E 05 | LAT | -2.862264E 01 | LON 1.252162E 02 |
| VE | 7.651597E 03 | PTE | 5.879812E-02 | AZE 7.284423E 01 |
| ANG | 1.539498E 00 | NFA | 7.634382E 01 | IAC 1.127394E 01 |
| CPA | 3.328853E 01 | VPA | 3.333629E 01 | CYA -9.895003E-01 |
| VYA | -1.039118E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.075000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.720722E 06 | YYY | -1.335827E 05 | ZZZ -5.423664E 06 |
| DXX | 6.662666E 03 | DYY | -7.256357E 01 | DZZ -4.581684E 03 |
| R | 6.578582E 06 | WT | 2.762281E 05 | F 1.777494E 05 |
| V | 8.086298E 03 | PTH | 7.461652E-02 | AZ 7.354199E 01 |
| ALT | 2.053110E 05 | LAT | -2.852361E 01 | LON 1.255793E 02 |
| VE | 7.683006E 03 | PTE | 7.853346E-02 | AZE 7.265143E 01 |
| ANG | 1.479672E 00 | NFA | 6.723793E 01 | IAC 1.128767E 01 |
| CPA | 3.308843E 01 | VPA | 3.313602E 01 | CYA -7.831647E-01 |
| VYA | -8.324280E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.080000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -3.687277E 06 | YYY | -1.339443E 05 | ZZZ | -5.446521E 06 | |
| DXX | 6.715170E 03 | DYY | -7.208662E 01 | DZZ | -4.560892E 03 | |
| R | 6.578643E 06 | WT | 2.741667E 05 | F | 1.777494E 05 | |
| V | 8.117908E 03 | PTH | 9.650417E-02 | AZ | 7.335720E 01 | |
| ALT | 2.053398E 05 | LAT | -2.842310E 01 | LON | 1.259432E 02 | |
| VE | 7.714634E 03 | PTE | 1.015490E-01 | AZE | 7.245975E 01 | |
| ANG | 1.458543E 00 | NFA | 5.768667E 01 | IAC | 1.130145E 01 | |
| CPA | 3.289085E 01 | VPA | 3.293783E 01 | CYA | -5.775327E-01 | |
| VYA | -6.266949E-01 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.080472E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -3.684107E 06 | YYY | -1.339783E 05 | ZZZ | -5.448672E 06 | |
| DXX | 6.720127E 03 | DYY | -7.203573E 01 | DZZ | -4.558923E 03 | |
| R | 6.578649E 06 | WT | 2.739721E 05 | F | 2.060472E 05 | |
| V | 8.120903E 03 | PTH | 9.873206E-02 | AZ | 7.333981E 01 | |
| ALT | 2.053434E 05 | LAT | -2.841354E 01 | LON | 1.259776E 02 | |
| VE | 7.717630E 03 | PTE | 1.038917E-01 | AZE | 7.244172E 01 | |
| ANG | 1.458660E 00 | NFA | 5.677812E 01 | IAC | 1.191818E 01 | |
| CPA | 3.287230E 01 | VPA | 3.291925E 01 | CYA | -5.581505E-01 | |
| VYA | -6.073017E-01 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.085000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -3.653561E 06 | YYY | -1.343034E 05 | ZZZ | -5.469278E 06 | |
| DXX | 6.771594E 03 | DYY | -7.154165E 01 | DZZ | -4.542466E 03 | |
| R | 6.578720E 06 | WT | 2.717901E 05 | F | 2.060472E 05 | |
| V | 8.154361E 03 | PTH | 1.208828E-01 | AZ | 7.317335E 01 | |
| ALT | 2.053849E 05 | LAT | -2.832109E 01 | LON | 1.263079E 02 | |
| VE | 7.751101E 03 | PTE | 1.271723E-01 | AZE | 7.226966E 01 | |
| ANG | 1.518669E 00 | NFA | 5.012920E 01 | IAC | 1.194678E 01 | |
| CPA | 3.260868E 01 | VPA | 3.267622E 01 | CYA | -7.911234E-01 | |
| VYA | -4.329487E-01 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.090000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.619561E 06 | YYY | -1.346599E 05 | ZZZ -5.491945E 06 |
| DXX | 6.828518E 03 | DYY | -7.115409E 01 | DZZ -4.524224E 03 |
| R | 6.578816E 06 | WT | 2.693806E 05 | F 2.060472E 05 |
| V | 8.191601E 03 | PTH | 1.489830E-01 | AZ 7.298855E 01 |
| ALT | 2.054486E 05 | LAT | -2.821752E 01 | LON 1.266736E 02 |
| VE | 7.788357E 03 | PTE | 1.566968E-01 | AZE 7.207869E 01 |
| ANG | 1.101118E 00 | NFA | 5.602733E 01 | IAC 1.195897E 01 |
| CPA | 3.252276E 01 | VPA | 3.260216E 01 | CYA -6.015263E-01 |
| VYA | -7.923714E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.095000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.585276E 06 | YYY | -1.350144E 05 | ZZZ -5.514521E 06 |
| DXX | 6.885541E 03 | DYY | -7.060976E 01 | DZZ -4.505921E 03 |
| R | 6.578934E 06 | WT | 2.669711E 05 | F 2.060472E 05 |
| V | 8.229155E 03 | PTH | 1.809314E-01 | AZ 7.280499E 01 |
| ALT | 2.055339E 05 | LAT | -2.811237E 01 | LON 1.270403E 02 |
| VE | 7.825924E 03 | PTE | 1.902558E-01 | AZE 7.188911E 01 |
| ANG | 1.268913E 00 | NFA | 4.024430E 01 | IAC 1.199264E 01 |
| CPA | 3.233543E 01 | VPA | 3.237149E 01 | CYA -4.031928E-01 |
| VYA | -4.390614E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.100000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.550706E 06 | YYY | -1.353659E 05 | ZZZ -5.537004E 06 |
| DXX | 6.942678E 03 | DYY | -6.995331E 01 | DZZ -4.487541E 03 |
| R | 6.579077E 06 | WT | 2.645616E 05 | F 2.060472E 05 |
| V | 8.267025E 03 | PTH | 2.165870E-01 | AZ 7.262236E 01 |
| ALT | 2.056434E 05 | LAT | -2.800565E 01 | LON 1.274080E 02 |
| VE | 7.863803E 03 | PTE | 2.276929E-01 | AZE 7.170057E 01 |
| ANG | 1.362323E 00 | NFA | 2.974092E 01 | IAC 1.201839E 01 |
| CPA | 3.214812E 01 | VPA | 3.219367E 01 | CYA -1.712132E-01 |
| VYA | -2.238536E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.105000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.515849E 06 | YYY | -1.357137E 05 | ZZZ -5.559396E 06 |
| DXX | 6.999932E 03 | DYY | -6.913411E 01 | DZZ -4.469086E 03 |
| R | 6.579247E 06 | WT | 2.621520E 05 | F 2.060472E 05 |
| V | 8.305213E 03 | PTH | 2.559537E-01 | AZ 7.244101E 01 |
| ALT | 2.057806E 05 | LAT | -2.789734E 01 | LON 1.277768E 02 |
| VE | 7.901997E 03 | PTE | 2.690147E-01 | AZE 7.151344E 01 |
| ANG | 1.502117E 00 | NFA | 2.114590E 01 | IAC 1.204562E 01 |
| CPA | 3.196426E 01 | VPA | 3.200809E 01 | CYA 5.125590E-02 |
| VYA | -3.644381E-03 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.110000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.480706E 06 | YYY | -1.360570E 05 | ZZZ -5.581695E 06 |
| DXX | 7.057305E 03 | DYY | -6.816426E 01 | DZZ -4.450561E 03 |
| R | 6.579449E 06 | WT | 2.597425E 05 | F 2.060472E 05 |
| V | 8.343722E 03 | PTH | 2.990692E-01 | AZ 7.226085E 01 |
| ALT | 2.059480E 05 | LAT | -2.778745E 01 | LON 1.281465E 02 |
| VE | 7.940508E 03 | PTE | 3.142562E-01 | AZE 7.132764E 01 |
| ANG | 1.673744E 00 | NFA | 1.410481E 01 | IAC 1.207337E 01 |
| CPA | 3.178131E 01 | VPA | 3.182485E 01 | CYA 2.750071E-01 |
| VYA | 2.218772E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.115000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.445276E 06 | YYY | -1.363950E 05 | ZZZ -5.603901E 06 |
| DXX | 7.114800E 03 | DYY | -6.703849E 01 | DZZ -4.431969E 03 |
| R | 6.579684E 06 | WT | 2.573330E 05 | F 2.060472E 05 |
| V | 8.382554E 03 | PTH | 3.459414E-01 | AZ 7.208192E 01 |
| ALT | 2.061488E 05 | LAT | -2.767596E 01 | LON 1.285172E 02 |
| VE | 7.979338E 03 | PTE | 3.634241E-01 | AZE 7.114319E 01 |
| ANG | 1.862356E 00 | NFA | 8.478867E 00 | IAC 1.210157E 01 |
| CPA | 3.159998E 01 | VPA | 3.164319E 01 | CYA 4.983976E-01 |
| VYA | 4.448768E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.120000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.409558E 06 | YYY | -1.367271E 05 | ZZZ -5.626015E 06 |
| DXX | 7.172420E 03 | DYY | -6.575437E 01 | DZZ -4.413312E 03 |
| R | 6.579956E 06 | WT | 2.549235E 05 | F 2.060472E 05 |
| V | 8.421713E 03 | PTH | 3.965907E-01 | AZ 7.190424E 01 |
| ALT | 2.063861E 05 | LAT | -2.756288E 01 | LON 1.288890E 02 |
| VE | 8.018491E 03 | PTE | 4.165331E-01 | AZE 7.096012E 01 |
| ANG | 2.064619E 00 | NFA | 3.951088E 00 | IAC 1.213031E 01 |
| CPA | 3.141985E 01 | VPA | 3.146284E 01 | CYA 7.214165E-01 |
| VYA | 6.680420E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.125000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.373551E 06 | YYY | -1.370523E 05 | ZZZ -5.648034E 06 |
| DXX | 7.230170E 03 | DYY | -6.430929E 01 | DZZ -4.394594E 03 |
| R | 6.580268E 06 | WT | 2.525140E 05 | F 2.060472E 05 |
| V | 8.461203E 03 | PTH | 4.510281E-01 | AZ 7.172782E 01 |
| ALT | 2.066627E 05 | LAT | -2.744819E 01 | LON 1.292617E 02 |
| VE | 8.057969E 03 | PTE | 4.735985E-01 | AZE 7.077843E 01 |
| ANG | 2.275968E 00 | NFA | 2.826106E-01 | IAC 1.215965E 01 |
| CPA | 3.124082E 01 | VPA | 3.128348E 01 | CYA 9.441169E-01 |
| VYA | 8.908259E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.130000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.337256E 06 | YYY | -1.373699E 05 | ZZZ -5.669960E 06 |
| DXX | 7.288052E 03 | DYY | -6.270050E 01 | DZZ -4.375818E 03 |
| R | 6.580623E 06 | WT | 2.501045E 05 | F 2.060472E 05 |
| V | 8.501025E 03 | PTH | 5.092717E-01 | AZ 7.155268E 01 |
| ALT | 2.069824E 05 | LAT | -2.733189E 01 | LON 1.296355E 02 |
| VE | 8.097775E 03 | PTE | 5.346331E-01 | AZE 7.059815E 01 |
| ANG | 2.493498E 00 | NFA | -2.728301E 00 | IAC 1.218958E 01 |
| CPA | 3.106270E 01 | VPA | 3.110527E 01 | CYA 1.166444E 00 |
| VYA | 1.113245E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.135000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.300671E 06 | YYY | -1.376790E 05 | ZZZ -5.691792E 06 |
| DXX | 7.346071E 03 | DYY | -6.092522E 01 | DZZ -4.356988E 03 |
| R | 6.581024E 06 | WT | 2.476950E 05 | F 2.060472E 05 |
| V | 8.541184E 03 | PTH | 5.713359E-01 | AZ 7.137883E 01 |
| ALT | 2.073480E 05 | LAT | -2.721399E 01 | LON 1.300103E 02 |
| VE | 8.137914E 03 | PTE | 5.996488E-01 | AZE 7.041929E 01 |
| ANG | 2.715150E 00 | NFA | -5.220665E 00 | IAC 1.222018E 01 |
| CPA | 3.088543E 01 | VPA | 3.092779E 01 | CYA 1.388409E 00 |
| VYA | 1.335299E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.140000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.263795E 06 | YYY | -1.379789E 05 | ZZZ -5.713530E 06 |
| DXX | 7.404231E 03 | DYY | -5.898060E 01 | DZZ -4.338106E 03 |
| R | 6.581476E 06 | WT | 2.452855E 05 | F 2.060472E 05 |
| V | 8.581683E 03 | PTH | 6.372302E-01 | AZ 7.120630E 01 |
| ALT | 2.077630E 05 | LAT | -2.709446E 01 | LON 1.303861E 02 |
| VE | 8.178387E 03 | PTE | 6.686550E-01 | AZE 7.024187E 01 |
| ANG | 2.939407E 00 | NFA | -7.303301E 00 | IAC 1.225153E 01 |
| CPA | 3.070866E 01 | VPA | 3.075082E 01 | CYA 1.609971E 00 |
| VYA | 1.556964E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.145000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.226628E 06 | YYY | -1.382686E 05 | ZZZ -5.735173E 06 |
| DXX | 7.462536E 03 | DYY | -5.686374E 01 | DZZ -4.319177E 03 |
| R | 6.581980E 06 | WT | 2.428760E 05 | F 2.060472E 05 |
| V | 8.622527E 03 | PTH | 7.069732E-01 | AZ 7.103510E 01 |
| ALT | 2.082305E 05 | LAT | -2.697332E 01 | LON 1.307629E 02 |
| VE | 8.219200E 03 | PTE | 7.416672E-01 | AZE 7.006590E 01 |
| ANG | 3.165214E 00 | NFA | -9.063528E 00 | IAC 1.228360E 01 |
| CPA | 3.053215E 01 | VPA | 3.057447E 01 | CYA 1.831142E 00 |
| VYA | 1.778221E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.150000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.189169E 06 | YYY | -1.385472E 05 | ZZZ -5.756722E 06 |
| DXX | 7.520991E 03 | DYY | -5.457163E 01 | DZZ -4.300203E 03 |
| R | 6.582541E 06 | WT | 2.404665E 05 | F 2.060472E 05 |
| V | 8.663719E 03 | PTH | 7.805737E-01 | AZ 7.086525E 01 |
| ALT | 2.087543E 05 | LAT | -2.685055E 01 | LON 1.311407E 02 |
| VE | 8.260357E 03 | PTE | 8.186929E-01 | AZE 6.989141E 01 |
| ANG | 3.391695E 00 | NFA | -1.055989E 01 | IAC 1.231646E 01 |
| CPA | 3.035606E 01 | VPA | 3.039840E 01 | CYA 2.051874E 00 |
| VYA | 1.999058E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.155000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.151418E 06 | YYY | -1.388140E 05 | ZZZ -5.778175E 06 |
| DXX | 7.579601E 03 | DYY | -5.210125E 01 | DZZ -4.281188E 03 |
| R | 6.583161E 06 | WT | 2.380570E 05 | F 2.060472E 05 |
| V | 8.705265E 03 | PTH | 8.580442E-01 | AZ 7.069677E 01 |
| ALT | 2.093375E 05 | LAT | -2.672615E 01 | LON 1.315196E 02 |
| VE | 8.301861E 03 | PTE | 8.997417E-01 | AZE 6.971840E 01 |
| ANG | 3.618147E 00 | NFA | -1.183505E 01 | IAC 1.235027E 01 |
| CPA | 3.017984E 01 | VPA | 3.022214E 01 | CYA 2.272183E 00 |
| VYA | 2.219478E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.160000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.113373E 06 | YYY | -1.390679E 05 | ZZZ -5.799534E 06 |
| DXX | 7.638370E 03 | DYY | -4.944946E 01 | DZZ -4.262135E 03 |
| R | 6.583846E 06 | WT | 2.356475E 05 | F 2.060472E 05 |
| V | 8.747168E 03 | PTH | 9.393952E-01 | AZ 7.052968E 01 |
| ALT | 2.099837E 05 | LAT | -2.660012E 01 | LON 1.318994E 02 |
| VE | 8.343716E 03 | PTE | 9.848228E-01 | AZE 6.954691E 01 |
| ANG | 3.844074E 00 | NFA | -1.293111E 01 | IAC 1.238501E 01 |
| CPA | 3.000360E 01 | VPA | 3.004582E 01 | CYA 2.492029E 00 |
| VYA | 2.439437E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.165000E | 03 |
|----------------------|---------------|-------------|---------------|-----------|---------------|
| XXX | -3.075034E 06 | YYY | -1.393082E 05 | ZZZ | -5.820797E 06 |
| DXX | 7.697306E 03 | DYY | -4.661305E 01 | DZZ | -4.243048E 03 |
| R | 6.584597E 06 | WT | 2.332380E 05 | F | 2.060472E 05 |
| V | 8.789434E 03 | PTH | 1.024637E 00 | AZ | 7.036399E 01 |
| ALT | 2.106968E 05 | LAT | -2.647245E 01 | LON | 1.322803E 02 |
| VE | 8.385929E 03 | PTE | 1.073945E 00 | AZE | 6.937694E 01 |
| ANG | 4.069031E 00 | NFA | -1.387461E 01 | IAC | 1.242072E 01 |
| CPA | 2.982662E 01 | VPA | 2.986911E 01 | CYA | 2.711406E 00 |
| VYA | 2.658925E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.170000E | 03 |
|----------------------|---------------|-------------|---------------|-----------|---------------|
| XXX | -3.036400E 06 | YYY | -1.395337E 05 | ZZZ | -5.841964E 06 |
| DXX | 7.756412E 03 | DYY | -4.358874E 01 | DZZ | -4.223930E 03 |
| R | 6.585419E 06 | WT | 2.308285E 05 | F | 2.060472E 05 |
| V | 8.832067E 03 | PTH | 1.113777E 00 | AZ | 7.019974E 01 |
| ALT | 2.114799E 05 | LAT | -2.634315E 01 | LON | 1.326622E 02 |
| VE | 8.428503E 03 | PTE | 1.167112E 00 | AZE | 6.920851E 01 |
| ANG | 4.292643E 00 | NFA | -1.468761E 01 | IAC | 1.245750E 01 |
| CPA | 2.964906E 01 | VPA | 2.969180E 01 | CYA | 2.930299E 00 |
| VYA | 2.877936E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.175000E | 03 |
|----------------------|---------------|-------------|---------------|-----------|---------------|
| XXX | -2.997470E 06 | YYY | -1.397437E 05 | ZZZ | -5.863036E 06 |
| DXX | 7.815696E 03 | DYY | -4.037315E 01 | DZZ | -4.204783E 03 |
| R | 6.586315E 06 | WT | 2.284190E 05 | F | 2.060472E 05 |
| V | 8.875074E 03 | PTH | 1.206822E 00 | AZ | 7.003693E 01 |
| ALT | 2.123372E 05 | LAT | -2.621220E 01 | LON | 1.330452E 02 |
| VE | 8.471445E 03 | PTE | 1.264331E 00 | AZE | 6.904165E 01 |
| ANG | 4.514577E 00 | NFA | -1.538686E 01 | IAC | 1.249547E 01 |
| CPA | 2.947080E 01 | VPA | 2.951358E 01 | CYA | 3.148673E 00 |
| VYA | 3.096438E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -2.958243E 06 | YYY | -1.399372E 05 | ZZZ | -5.884012E 06 |
| DXX | 7.875164E 03 | DYY | -3.696285E 01 | DZZ | -4.185613E 03 |
| R | 6.587289E 06 | WT | 2.260095E 05 | F | 2.060472E 05 |
| V | 8.918460E 03 | PTH | 1.303780E 00 | AZ | 6.987558E 01 |
| ALT | 2.132724E 05 | LAT | -2.607961E 01 | LON | 1.334291E 02 |
| VE | 8.514759E 03 | PTE | 1.365607E 00 | AZE | 6.887638E 01 |
| ANG | 4.734538E 00 | NFA | -1.598536E 01 | IAC | 1.253466E 01 |
| CPA | 2.929097E 01 | VPA | 2.933410E 01 | CYA | 3.366531E 00 |
| VYA | 3.314430E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -2.918718E 06 | YYY | -1.401130E 05 | ZZZ | -5.904892E 06 |
| DXX | 7.934823E 03 | DYY | -3.335427E 01 | DZZ | -4.166420E 03 |
| R | 6.588345E 06 | WT | 2.236000E 05 | F | 2.060472E 05 |
| V | 8.962231E 03 | PTH | 1.404658E 00 | AZ | 6.971573E 01 |
| ALT | 2.142889E 05 | LAT | -2.594538E 01 | LON | 1.338141E 02 |
| VE | 8.558453E 03 | PTE | 1.470943E 00 | AZE | 6.871271E 01 |
| ANG | 4.952307E 00 | NFA | -1.649821E 01 | IAC | 1.257514E 01 |
| CPA | 2.910974E 01 | VPA | 2.915343E 01 | CYA | 3.583852E 00 |
| VYA | 3.531873E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -2.878894E 06 | YYY | -1.402704E 05 | ZZZ | -5.925676E 06 |
| DXX | 7.994680E 03 | DYY | -2.954378E 01 | DZZ | -4.147210E 03 |
| R | 6.589487E 06 | WT | 2.211905E 05 | F | 2.060472E 05 |
| V | 9.006394E 03 | PTH | 1.509457E 00 | AZ | 6.955738E 01 |
| ALT | 2.153910E 05 | LAT | -2.580949E 01 | LON | 1.342001E 02 |
| VE | 8.602531E 03 | PTE | 1.580338E 00 | AZE | 6.855066E 01 |
| ANG | 5.167599E 00 | NFA | -1.693073E 01 | IAC | 1.261705E 01 |
| CPA | 2.892693E 01 | VPA | 2.897096E 01 | CYA | 3.800601E 00 |
| VYA | 3.748760E-00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.195000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.838770E 06 | YYY | -1.404081E 05 | ZZZ -5.946364E 06 |
| DXX | 8.054744E 03 | DYY | -2.552764E 01 | DZZ -4.127984E 03 |
| R | 6.590719E 06 | WT | 2.187810E 05 | F 2.060472E 05 |
| V | 9.050956E 03 | PTH | 1.618179E 00 | AZ 6.940056E 01 |
| ALT | 2.165825E 05 | LAT | -2.567195E 01 | LON 1.345871E 02 |
| VE | 8.647001E 03 | PTE | 1.693797E 00 | AZE 6.839025E 01 |
| ANG | 5.380168E 00 | NFA | -1.728993E 01 | IAC 1.266046E 01 |
| CPA | 2.874180E 01 | VPA | 2.878637E 01 | CYA 4.016776E 00 |
| VYA | 3.965068E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.200000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.798346E 06 | YYY | -1.405253E 05 | ZZZ -5.966956E 06 |
| DXX | 8.115021E 03 | DYY | -2.130201E 01 | DZZ -4.108745E 03 |
| R | 6.592044E 06 | WT | 2.163715E 05 | F 2.060472E 05 |
| V | 9.095923E 03 | PTH | 1.730829E 00 | AZ 6.924530E 01 |
| ALT | 2.178673E 05 | LAT | -2.553277E 01 | LON 1.349752E 02 |
| VE | 8.691870E 03 | PTE | 1.811314E 00 | AZE 6.823151E 01 |
| ANG | 5.589843E 00 | NFA | -1.758267E 01 | IAC 1.270551E 01 |
| CPA | 2.855431E 01 | VPA | 2.859942E 01 | CYA 4.232342E 00 |
| VYA | 4.180781E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.205000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.757620E 06 | YYY | -1.406208E 05 | ZZZ -5.987452E 06 |
| DXX | 8.175522E 03 | DYY | -1.686293E 01 | DZZ -4.089497E 03 |
| R | 6.593468E 06 | WT | 2.139620E 05 | F 2.060472E 05 |
| V | 9.141303E 03 | PTH | 1.847401E 00 | AZ 6.909160E 01 |
| ALT | 2.192497E 05 | LAT | -2.539192E 01 | LON 1.353643E 02 |
| VE | 8.737145E 03 | PTE | 1.932889E 00 | AZE 6.807445E 01 |
| ANG | 5.796409E 00 | NFA | -1.781345E 01 | IAC 1.275228E 01 |
| CPA | 2.836397E 01 | VPA | 2.840975E 01 | CYA 4.447277E 00 |
| VYA | 4.395870E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.210000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.716591E 06 | YYY | -1.406936E 05 | ZZZ -6.007851E 06 |
| DXX | 8.236255E 03 | DYY | -1.220636E 01 | DZZ -4.070242E 03 |
| R | 6.594993E 06 | WT | 2.115525E 05 | F 2.060472E 05 |
| V | 9.187106E 03 | PTH | 1.967897E 00 | AZ 6.893950E 01 |
| ALT | 2.207335E 05 | LAT | -2.524943E 01 | LON 1.357544E 02 |
| VE | 8.782835E 03 | PTE | 2.058518E 00 | AZE 6.791910E 01 |
| ANG | 5.999735E 00 | NFA | -1.798747E 01 | IAC 1.280086E 01 |
| CPA | 2.817049E 01 | VPA | 2.821719E 01 | CYA 4.661556E 00 |
| VYA | 4.610320E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.215000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.675257E 06 | YYY | -1.407425E 05 | ZZZ -6.028154E 06 |
| DXX | 8.297229E 03 | DYY | -7.328119E 00 | DZZ -4.050983E 03 |
| R | 6.596624E 06 | WT | 2.091430E 05 | F 2.060472E 05 |
| V | 9.233338E 03 | PTH | 2.092311E 00 | AZ 6.878902E 01 |
| ALT | 2.223230E 05 | LAT | -2.510527E 01 | LON 1.361455E 02 |
| VE | 8.828947E 03 | PTE | 2.188191E 00 | AZE 6.776548E 01 |
| ANG | 6.199500E 00 | NFA | -1.810442E 01 | IAC 1.285144E 01 |
| CPA | 2.797338E 01 | VPA | 2.802100E 01 | CYA 4.875186E 00 |
| VYA | 4.824099E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.220000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.633618E 06 | YYY | -1.407665E 05 | ZZZ -6.048361E 06 |
| DXX | 8.358456E 03 | DYY | -2.223902E 00 | DZZ -4.031720E 03 |
| R | 6.598365E 06 | WT | 2.067334E 05 | F 2.060472E 05 |
| V | 9.280008E 03 | PTH | 2.220635E 00 | AZ 6.864018E 01 |
| ALT | 2.240226E 05 | LAT | -2.495946E 01 | LON 1.365377E 02 |
| VE | 8.875490E 03 | PTE | 2.321899E 00 | AZE 6.761361E 01 |
| ANG | 6.395672E 00 | NFA | -1.817008E 01 | IAC 1.290407E 01 |
| CPA | 2.777250E 01 | VPA | 2.782117E 01 | CYA 5.088100E 00 |
| VYA | 5.037178E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.225000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.591672E 06 | YYY | -1.407643E 05 | ZZZ | -6.068471E 06 | |
| DXX | 8.419946E 03 | DYY | 3.110700E 00 | DZZ | -4.012457E 03 | |
| R | 6.600221E 06 | WT | 2.043239E 05 | F | 2.060472E 05 | |
| V | 9.327127E 03 | PTH | 2.352860E 00 | AZ | 6.849300E 01 | |
| ALT | 2.258362E 05 | LAT | -2.481200E 01 | LON | 1.369309E 02 | |
| VE | 8.922474E 03 | PTE | 2.459632E 00 | AZE | 6.746351E 01 | |
| ANG | 6.587898E 00 | NFA | -1.818042E 01 | IAC | 1.295904E 01 | |
| CPA | 2.756691E 01 | VPA | 2.761665E 01 | CYA | 5.300292E 00 | |
| VYA | 5.249561E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.230000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.549418E 06 | YYY | -1.407350E 05 | ZZZ | -6.088485E 06 | |
| DXX | 8.481710E 03 | DYY | 8.680246E 00 | DZZ | -3.993196E 03 | |
| R | 6.602196E 06 | WT | 2.019144E 05 | F | 2.060472E 05 | |
| V | 9.374705E 03 | PTH | 2.488977E 00 | AZ | 6.834751E 01 | |
| ALT | 2.277685E 05 | LAT | -2.466287E 01 | LON | 1.373251E 02 | |
| VE | 8.969908E 03 | PTE | 2.601376E 00 | AZE | 6.731521E 01 | |
| ANG | 6.776201E 00 | NFA | -1.814328E 01 | IAC | 1.301636E 01 | |
| CPA | 2.735666E 01 | VPA | 2.740777E 01 | CYA | 5.511726E 00 | |
| VYA | 5.461172E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.235000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.506854E 06 | YYY | -1.406771E 05 | ZZZ | -6.108403E 06 | |
| DXX | 8.543761E 03 | DYY | 1.448942E 01 | DZZ | -3.973936E 03 | |
| R | 6.604294E 06 | WT | 1.995049E 05 | F | 2.060472E 05 | |
| V | 9.422751E 03 | PTH | 2.628970E 00 | AZ | 6.820372E 01 | |
| ALT | 2.298237E 05 | LAT | -2.451209E 01 | LON | 1.377204E 02 | |
| VE | 9.017804E 03 | PTE | 2.747113E 00 | AZE | 6.716873E 01 | |
| ANG | 6.960215E 00 | NFA | -1.805231E 01 | IAC | 1.307630E 01 | |
| CPA | 2.714089E 01 | VPA | 2.719323E 01 | CYA | 5.722402E 00 | |
| VYA | 5.672033E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.240000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.463980E 06 | YYY | -1.405897E 05 | ZZZ -6.128225E 06 |
| DXX | 8.606112E 03 | DYY | 2.054306E 01 | DZZ -3.954680E 03 |
| R | 6.606519E 06 | WT | 1.970954E 05 | F 2.060472E 05 |
| V | 9.471276E 03 | PTH | 2.772822E 00 | AZ 6.806167E 01 |
| ALT | 2.320063E 05 | LAT | -2.435966E 01 | LON 1.381167E 02 |
| VE | 9.066171E 03 | PTE | 2.896824E 00 | AZE 6.702408E 01 |
| ANG | 7.139944E 00 | NFA | -1.791252E 01 | IAC 1.313895E 01 |
| CPA | 2.691936E 01 | VPA | 2.697310E 01 | CYA 5.932224E 00 |
| VYA | 5.882074E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.245000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.420793E 06 | YYY | -1.404713E 05 | ZZZ -6.147950E 06 |
| DXX | 8.668777E 03 | DYY | 2.684613E 01 | DZZ -3.935427E 03 |
| R | 6.608877E 06 | WT | 1.946859E 05 | F 2.060472E 05 |
| V | 9.520294E 03 | PTH | 2.920514E 00 | AZ 6.792138E 01 |
| ALT | 2.343208E 05 | LAT | -2.420557E 01 | LON 1.385140E 02 |
| VE | 9.115021E 03 | PTE | 3.050486E 00 | AZE 6.688130E 01 |
| ANG | 7.315104E 00 | NFA | -1.771999E 01 | IAC 1.320455E 01 |
| CPA | 2.669090E 01 | VPA | 2.674639E 01 | CYA 6.141251E 00 |
| VYA | 6.091280E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.250000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.377291E 06 | YYY | -1.403208E 05 | ZZZ -6.167579E 06 |
| DXX | 8.731769E 03 | DYY | 3.340377E 01 | DZZ -3.916178E 03 |
| R | 6.611372E 06 | WT | 1.922764E 05 | F 2.060472E 05 |
| V | 9.569815E 03 | PTH | 3.072018E 00 | AZ 6.778287E 01 |
| ALT | 2.367717E 05 | LAT | -2.404983E 01 | LON 1.389124E 02 |
| VE | 9.164367E 03 | PTE | 3.208068E 00 | AZE 6.674041E 01 |
| ANG | 7.485581E 00 | NFA | -1.747413E 01 | IAC 1.327339E 01 |
| CPA | 2.645549E 01 | VPA | 2.651251E 01 | CYA 6.349354E 00 |
| VYA | 6.299625E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.255000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.333474E 06 | YYY | -1.401368E 05 | ZZZ | -6.187112E 06 | 06 |
| DXX | 8.795105E 03 | DYY | 4.022127E 01 | DZZ | -3.896932E 03 | 03 |
| R | 6.614007E 06 | WT | 1.898669E 05 | F | 2.060472E 05 | 05 |
| V | 9.619853E 03 | PTH | 3.227310E 00 | AZ | 6.764617E 01 | 01 |
| ALT | 2.393637E 05 | LAT | -2.389243E 01 | LON | 1.393118E 02 | 02 |
| VE | 9.214221E 03 | PTE | 3.369544E 00 | AZE | 6.660143E 01 | 01 |
| ANG | 7.651341E 00 | NFA | -1.717673E 01 | IAC | 1.334549E 01 | 01 |
| CPA | 2.621228E 01 | VPA | 2.627122E 01 | CYA | 6.556559E 00 | 00 |
| VYA | 6.507038E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.260000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.289340E 06 | YYY | -1.399181E 05 | ZZZ | -6.206548E 06 | 06 |
| DXX | 8.858801E 03 | DYY | 4.730409E 01 | DZZ | -3.877688E 03 | 03 |
| R | 6.616789E 06 | WT | 1.874574E 05 | F | 2.060472E 05 | 05 |
| V | 9.670422E 03 | PTH | 3.386357E 00 | AZ | 6.751130E 01 | 01 |
| ALT | 2.421013E 05 | LAT | -2.373339E 01 | LON | 1.397122E 02 | 02 |
| VE | 9.264597E 03 | PTE | 3.534876E 00 | AZE | 6.646440E 01 | 01 |
| ANG | 7.812141E 00 | NFA | -1.682232E 01 | IAC | 1.342123E 01 | 01 |
| CPA | 2.596001E 01 | VPA | 2.602131E 01 | CYA | 6.762790E 00 | 00 |
| VYA | 6.713506E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.265000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.244886E 06 | YYY | -1.396633E 05 | ZZZ | -6.225889E 06 | 06 |
| DXX | 8.922873E 03 | DYY | 5.465784E 01 | DZZ | -3.858444E 03 | 03 |
| R | 6.619721E 06 | WT | 1.850479E 05 | F | 2.060472E 05 | 05 |
| V | 9.721535E 03 | PTH | 3.549122E 00 | AZ | 6.737828E 01 | 01 |
| ALT | 2.449892E 05 | LAT | -2.357269E 01 | LON | 1.401137E 02 | 02 |
| VE | 9.315510E 03 | PTE | 3.704024E 00 | AZE | 6.632932E 01 | 01 |
| ANG | 7.967966E 00 | NFA | -1.641091E 01 | IAC | 1.350078E 01 | 01 |
| CPA | 2.569872E 01 | VPA | 2.576233E 01 | CYA | 6.968014E 00 | 00 |
| VYA | 6.918974E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.270000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.200110E 06 | YYY | -1.393711E 05 | ZZZ -6.245133E 06 |
| DXX | 8.987341E 03 | DYY | 6.228835E 01 | DZZ -3.839196E 03 |
| R | 6.622808E 06 | WT | 1.826384E 05 | F 2.060472E 05 |
| V | 9.773209E 03 | PTH | 3.715560E 00 | AZ 6.724715E 01 |
| ALT | 2.480323E 05 | LAT | -2.341036E 01 | LON 1.405162E 02 |
| VE | 9.366974E 03 | PTE | 3.876941E 00 | AZE 6.619623E 01 |
| ANG | 8.118647E 00 | NFA | -1.593762E 01 | IAC 1.358443E 01 |
| CPA | 2.542644E 01 | VPA | 2.549311E 01 | CYA 7.172172E 00 |
| VYA | 7.123396E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.275000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.155012E 06 | YYY | -1.390400E 05 | ZZZ -6.264281E 06 |
| DXX | 9.052224E 03 | DYY | 7.020158E 01 | DZZ -3.819941E 03 |
| R | 6.626056E 06 | WT | 1.802289E 05 | F 2.060472E 05 |
| V | 9.825459E 03 | PTH | 3.885624E 00 | AZ 6.711793E 01 |
| ALT | 2.512351E 05 | LAT | -2.324638E 01 | LON 1.409198E 02 |
| VE | 9.419005E 03 | PTE | 4.053572E 00 | AZE 6.606516E 01 |
| ANG | 8.264106E 00 | NFA | -1.539871E 01 | IAC 1.367255E 01 |
| CPA | 2.514301E 01 | VPA | 2.521267E 01 | CYA 7.375228E 00 |
| VYA | 7.326698E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.280000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.109587E 06 | YYY | -1.386686E 05 | ZZZ -6.283332E 06 |
| DXX | 9.117543E 03 | DYY | 7.840370E 01 | DZZ -3.800674E 03 |
| R | 6.629468E 06 | WT | 1.778194E 05 | F 2.060472E 05 |
| V | 9.878302E 03 | PTH | 4.059261E 00 | AZ 6.699063E 01 |
| ALT | 2.546026E 05 | LAT | -2.308076E 01 | LON 1.413244E 02 |
| VE | 9.471620E 03 | PTE | 4.233864E 00 | AZE 6.593612E 01 |
| ANG | 8.404366E 00 | NFA | -1.479030E 01 | IAC 1.376555E 01 |
| CPA | 2.484759E 01 | VPA | 2.491998E 01 | CYA 7.577084E 00 |
| VYA | 7.528848E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.285000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.063836E 06 | YYY | -1.382554E 05 | ZZZ | -6.302287E 06 | |
| DXX | 9.183319E 03 | DYY | 8.690110E 01 | DZZ | -3.781387E 03 | |
| R | 6.633050E 06 | WT | 1.754099E 05 | F | 2.060472E 05 | |
| V | 9.931757E 03 | PTH | 4.236401E 00 | AZ | 6.686530E 01 | |
| ALT | 2.581394E 05 | LAT | -2.291350E 01 | LON | 1.417301E 02 | |
| VE | 9.524837E 03 | PTE | 4.417741E 00 | AZE | 6.580915E 01 | |
| ANG | 8.539375E 00 | NFA | -1.410576E 01 | IAC | 1.386346E 01 | |
| CPA | 2.453779E 01 | VPA | 2.461358E 01 | CYA | 7.777678E 00 | |
| VYA | 7.729788E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.290000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -2.017754E 06 | YYY | -1.377991E 05 | ZZZ | -6.321146E 06 | |
| DXX | 9.249577E 03 | DYY | 9.570030E 01 | DZZ | -3.762074E 03 | |
| R | 6.636807E 06 | WT | 1.730004E 05 | F | 2.060472E 05 | |
| V | 9.985842E 03 | PTH | 4.416981E 00 | AZ | 6.674195E 01 | |
| ALT | 2.618506E 05 | LAT | -2.274462E 01 | LON | 1.421368E 02 | |
| VE | 9.578674E 03 | PTE | 4.605133E 00 | AZE | 6.568426E 01 | |
| ANG | 8.669380E 00 | NFA | -1.334572E 01 | IAC | 1.396684E 01 | |
| CPA | 2.421335E 01 | VPA | 2.429312E 01 | CYA | 7.976934E 00 | |
| VYA | 7.929363E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.295000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -1.971339E 06 | YYY | -1.372979E 05 | ZZZ | -6.339908E 06 | |
| DXX | 9.316340E 03 | DYY | 1.048081E 02 | DZZ | -3.742725E 03 | |
| R | 6.640742E 06 | WT | 1.705909E 05 | F | 2.060472E 05 | |
| V | 1.004058E 04 | PTH | 4.600916E 00 | AZ | 6.662062E 01 | |
| ALT | 2.657409E 05 | LAT | -2.257410E 01 | LON | 1.425446E 02 | |
| VE | 9.633152E 03 | PTE | 4.795953E 00 | AZE | 6.556149E 01 | |
| ANG | 8.794205E 00 | NFA | -1.249314E 01 | IAC | 1.407615E 01 | |
| CPA | 2.387151E 01 | VPA | 2.395552E 01 | CYA | 8.174791E 00 | |
| VYA | 8.127551E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.300000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -1.924589E 06 | YYY | -1.367505E 05 | ZZZ | -6.358573E 06 | |
| DXX | 9.383637E 03 | DYY | 1.142313E 02 | DZZ | -3.723326E 03 | |
| R | 6.644862E 06 | WT | 1.681814E 05 | F | 2.060472E 05 | |
| V | 1.009598E 04 | PTH | 4.788111E 00 | AZ | 6.650131E 01 | |
| ALT | 2.698152E 05 | LAT | -2.240197E 01 | LON | 1.429534E 02 | |
| VE | 9.688291E 03 | PTE | 4.990099E 00 | AZE | 6.544087E 01 | |
| ANG | 8.914362E 00 | NFA | -1.154935E 01 | IAC | 1.419177E 01 | |
| CPA | 2.351145E 01 | VPA | 2.360049E 01 | CYA | 8.371058E 00 | |
| VYA | 8.324203E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.305000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -1.877502E 06 | YYY | -1.361551E 05 | ZZZ | -6.377141E 06 | |
| DXX | 9.451495E 03 | DYY | 1.239771E 02 | DZZ | -3.703864E 03 | |
| R | 6.649171E 06 | WT | 1.657719E 05 | F | 2.060472E 05 | |
| V | 1.015208E 04 | PTH | 4.978463E 00 | AZ | 6.638407E 01 | |
| ALT | 2.740786E 05 | LAT | -2.222821E 01 | LON | 1.433633E 02 | |
| VE | 9.744113E 03 | PTE | 5.187460E 00 | AZE | 6.532240E 01 | |
| ANG | 9.029796E 00 | NFA | -1.049204E 01 | IAC | 1.431451E 01 | |
| CPA | 2.313147E 01 | VPA | 2.322400E 01 | CYA | 8.565590E 00 | |
| VYA | 8.519200E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | | 9.310000E 03 |
|----------------------|---------------|-----|---------------|-----|---------------|--------------|
| XXX | -1.830073E 06 | YYY | -1.355101E 05 | ZZZ | -6.395612E 06 | |
| DXX | 9.519943E 03 | DYY | 1.340528E 02 | DZZ | -3.684322E 03 | |
| R | 6.653674E 06 | WT | 1.633624E 05 | F | 2.060472E 05 | |
| V | 1.020889E 04 | PTH | 5.171853E 00 | AZ | 6.626890E 01 | |
| ALT | 2.785355E 05 | LAT | -2.205284E 01 | LON | 1.437742E 02 | |
| VE | 9.800640E 03 | PTE | 5.387914E 00 | AZE | 6.520613E 01 | |
| ANG | 9.141428E 00 | NFA | -9.326350E 00 | IAC | 1.444408E 01 | |
| CPA | 2.272642E 01 | VPA | 2.282633E 01 | CYA | 8.758328E 00 | |
| VYA | 8.712325E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -1.782301E 06 | YYY | -1.348140E 05 | ZZZ | -6.413984E 06 |
| DXX | 9.589017E 03 | DYY | 1.444657E 02 | DZZ | -3.664678E 03 |
| R | 6.658376E 06 | WT | 1.609529E 05 | F | 2.060472E 05 |
| V | 1.026645E 04 | PTH | 5.368134E 00 | AZ | 6.615585E 01 |
| ALT | 2.831909E 05 | LAT | -2.187586E 01 | LON | 1.441863E 02 |
| VE | 9.857898E 03 | PTE | 5.591306E 00 | AZE | 6.509207E 01 |
| ANG | 9.249545E 00 | NFA | -8.019243E 00 | IAC | 1.458238E 01 |
| CPA | 2.229608E 01 | VPA | 2.240158E 01 | CYA | 8.948864E 00 |
| VYA | 8.903512E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -1.734182E 06 | YYY | -1.340649E 05 | ZZZ | -6.432258E 06 |
| DXX | 9.658750E 03 | DYY | 1.552233E 02 | DZZ | -3.644906E 03 |
| R | 6.663280E 06 | WT | 1.585434E 05 | F | 2.060472E 05 |
| V | 1.032477E 04 | PTH | 5.567151E 00 | AZ | 6.604492E 01 |
| ALT | 2.880496E 05 | LAT | -2.169728E 01 | LON | 1.445994E 02 |
| VE | 9.915911E 03 | PTE | 5.797470E 00 | AZE | 6.498024E 01 |
| ANG | 9.355357E 00 | NFA | -6.573984E 00 | IAC | 1.472914E 01 |
| CPA | 2.183556E 01 | VPA | 2.194955E 01 | CYA | 9.137072E 00 |
| VYA | 9.092300E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

| GEOCENTRIC REFERENCE | | | FLIGHT TIME | | |
|----------------------|---------------|-----|---------------|-----|---------------|
| XXX | -1.685712E 06 | YYY | -1.332612E 05 | ZZZ | -6.450433E 06 |
| DXX | 9.729179E 03 | DYY | 1.663331E 02 | DZZ | -3.624976E 03 |
| R | 6.668393E 06 | WT | 1.561339E 05 | F | 2.060472E 05 |
| V | 1.038388E 04 | PTH | 5.768711E 00 | AZ | 6.593614E 01 |
| ALT | 2.931164E 05 | LAT | -2.151710E 01 | LON | 1.450135E 02 |
| VE | 9.974705E 03 | PTE | 6.006205E 00 | AZE | 6.487067E 01 |
| ANG | 9.459905E 00 | NFA | -4.959915E 00 | IAC | 1.488562E 01 |
| CPA | 2.134381E 01 | VPA | 2.146444E 01 | CYA | 9.322422E 00 |
| VYA | 9.278374E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.330000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -1.636889E 06 | YYY | -1.324010E 05 | ZZZ -6.468508E 06 |
| DXX | 9.800347E 03 | DYY | 1.778024E 02 | DZZ -3.604851E 03 |
| R | 6.673719E 06 | WT | 1.537244E 05 | F 2.060472E 05 |
| V | 1.044382E 04 | PTH | 5.972597E 00 | AZ 6.582952E 01 |
| ALT | 2.983959E 05 | LAT | -2.133533E 01 | LON 1.454288E 02 |
| VE | 1.003431E 04 | PTE | 6.217286E 00 | AZE 6.476338E 01 |
| ANG | 9.564687E 00 | NFA | -3.126297E 00 | IAC 1.505334E 01 |
| CPA | 2.080726E 01 | VPA | 2.093683E 01 | CYA 9.504353E 00 |
| VYA | 9.461228E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.335000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -1.587708E 06 | YYY | -1.314825E 05 | ZZZ -6.486481E 06 |
| DXX | 9.872297E 03 | DYY | 1.896380E 02 | DZZ -3.584484E 03 |
| R | 6.679262E 06 | WT | 1.513148E 05 | F 2.060472E 05 |
| V | 1.050461E 04 | PTH | 6.178537E 00 | AZ 6.572508E 01 |
| ALT | 3.038923E 05 | LAT | -2.115197E 01 | LON 1.458452E 02 |
| VE | 1.009475E 04 | PTE | 6.430426E 00 | AZE 6.465837E 01 |
| ANG | 9.672646E 00 | NFA | -1.113657E 00 | IAC 1.523097E 01 |
| CPA | 2.022195E 01 | VPA | 2.037213E 01 | CYA 9.682335E 00 |
| VYA | 9.639997E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.340000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -1.538165E 06 | YYY | -1.305040E 05 | ZZZ -6.504352E 06 |
| DXX | 9.945079E 03 | DYY | 2.018465E 02 | DZZ -3.563814E 03 |
| R | 6.685026E 06 | WT | 1.489053E 05 | F 2.060472E 05 |
| V | 1.056627E 04 | PTH | 6.386201E 00 | AZ 6.562281E 01 |
| ALT | 3.096101E 05 | LAT | -2.096702E 01 | LON 1.462627E 02 |
| VE | 1.015607E 04 | PTE | 6.645280E 00 | AZE 6.455565E 01 |
| ANG | 9.786799E 00 | NFA | 1.230744E 00 | IAC 1.542567E 01 |
| CPA | 1.958191E 01 | VPA | 1.974295E 01 | CYA 9.854433E 00 |
| VYA | 9.813739E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.345000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -1.488255E 06 | YYY | -1.294634E 05 | ZZZ -6.522119E 06 |
| DXX | 1.001875E 04 | DYY | 2.144322E 02 | DZZ -3.542767E 03 |
| R | 6.691016E 06 | WT | 1.464958E 05 | F 2.060472E 05 |
| V | 1.062885E 04 | PTH | 6.595176E 00 | AZ 6.552272E 01 |
| ALT | 3.155534E 05 | LAT | -2.078050E 01 | LON 1.466813E 02 |
| VE | 1.021828E 04 | PTE | 6.861418E 00 | AZE 6.445521E 01 |
| ANG | 9.910451E 00 | NFA | 3.819767E 00 | IAC 1.563119E 01 |
| CPA | 1.888107E 01 | VPA | 1.906155E 01 | CYA 1.001748E 01 |
| VYA | 9.979407E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.350000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -1.437975E 06 | YYY | -1.283589E 05 | ZZZ -6.539778E 06 |
| DXX | 1.009357E 04 | DYY | 2.274889E 02 | DZZ -3.520552E 03 |
| R | 6.697234E 06 | WT | 1.440863E 05 | F 2.060472E 05 |
| V | 1.069235E 04 | PTH | 6.801058E 00 | AZ 6.542520E 01 |
| ALT | 3.217249E 05 | LAT | -2.059241E 01 | LON 1.471011E 02 |
| VE | 1.028139E 04 | PTE | 7.074263E 00 | AZE 6.435748E 01 |
| ANG | 1.022370E 01 | NFA | 1.101316E 01 | IAC 1.595485E 01 |
| CPA | 1.759785E 01 | VPA | 1.753639E 01 | CYA 1.019130E 01 |
| VYA | 1.019312E 01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.355000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -1.387318E 06 | YYY | -1.271882E 05 | ZZZ -6.557324E 06 |
| DXX | 1.016930E 04 | DYY | 2.408133E 02 | DZZ -3.498164E 03 |
| R | 6.703681E 06 | WT | 1.416768E 05 | F 2.060472E 05 |
| V | 1.075685E 04 | PTH | 7.009484E 00 | AZ 6.532922E 01 |
| ALT | 3.281247E 05 | LAT | -2.040276E 01 | LON 1.475220E 02 |
| VE | 1.034550E 04 | PTE | 7.289672E 00 | AZE 6.426138E 01 |
| ANG | 1.012181E 01 | NFA | 9.499905E 00 | IAC 1.608390E 01 |
| CPA | 1.757717E 01 | VPA | 1.757886E 01 | CYA 1.020791E 01 |
| VYA | 1.020356E 01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10-LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | | 9.360000E 03 |
|----------------------|---------------|-----|---------------|-------------|---------------|--------------|
| XXX | -1.336281E 06 | YYY | -1.259504E 05 | ZZZ | -6.574760E 06 | 06 |
| DXX | 1.024581E 04 | DYY | 2.543656E 02 | DZZ | -3.476124E 03 | 03 |
| R | 6.710364E 06 | WT | 1.392673E 05 | F | 2.060472E 05 | 05 |
| V | 1.082242E 04 | PTH | 7.223358E 00 | AZ | 6.523463E 01 | 01 |
| ALT | 3.347612E 05 | LAT | -2.021153E 01 | LON | 1.479440E 02 | 02 |
| VE | 1.041067E 04 | PTE | 7.510660E 00 | AZE | 6.416675E 01 | 01 |
| ANG | 1.004100E 01 | NFA | 8.311643E 00 | IAC | 1.622291E 01 | 01 |
| CPA | 1.756255E 01 | VPA | 1.756171E 01 | CYA | 1.021930E 01 | 01 |
| VYA | 1.021971E 01 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

| TRANSLUNAR INJECTION (S-IVB CUTOFF) | | | | FLIGHT TIME | | 9.360895E 03 |
|-------------------------------------|---------------|-----|---------------|-------------|---------------|--------------|
| XXX | -1.327110E 06 | YYY | -1.257217E 05 | ZZZ | -6.577868E 06 | 06 |
| DXX | 1.025958E 04 | DYY | 2.568137E 02 | DZZ | -3.472218E 03 | 03 |
| R | 6.711585E 06 | WT | 1.388363E 05 | F | 2.060472E 05 | 05 |
| V | 1.083426E 04 | PTH | 7.262197E 00 | AZ | 6.521785E 01 | 01 |
| ALT | 3.359740E 05 | LAT | -2.017715E 01 | LON | 1.480196E 02 | 02 |
| VE | 1.042244E 04 | PTE | 7.550786E 00 | AZE | 6.414997E 01 | 01 |
| ANG | 1.002346E 01 | NFA | 8.083086E 00 | IAC | 1.624792E 01 | 01 |
| CPA | 1.756255E 01 | VPA | 1.756192E 01 | CYA | 1.021930E 01 | 01 |
| VYA | 1.021948E 01 | CRA | -0.000000E-39 | VRA | 0.000000E-39 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

| | | | |
|----------------------|--------------------|-------------------|---------------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 25 MIN., | 27.435 SEC.,GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 9.3608950D 03 |
| X 1.4865970D 06 | Y-6.1217009D 06 | Z-2.3152059D 06 | |
| DX 1.0152074D 04 | DY-4.5672598D 02 | DZ 3.7560639D 03 | |
| R 6.7115848D 06 | DEC-2.0179149D 01 | RA-7.6350476D 01 | |
| V 1.0834261D 04 | PTH 7.2621961D 00 | AZ 6.5217439D 01 | |
| ALT 3.3597562D 05 | LTGD-2.0297775D 01 | LON 1.4801867D 02 | |
| VE 1.0422450D 04 | PTE 7.4990434D 00 | AZE 6.4135454D 01 | |

| | | | |
|----------------------|--------------------|-------------------|---------------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 27 MIN., | 19.935 SEC.,GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 9.4733950D 03 |
| X 2.6135841D 06 | Y-6.1232335D 06 | Z-1.8749251D 06 | |
| DX 9.8609089D 03 | DY 4.1641773D 02 | DZ 4.0561755D 03 | |
| R 6.9166577D 06 | DEC-1.5728177D 01 | RA-6.6885719D 01 | |
| V 1.0670684D 04 | PTH 1.2216315D 01 | AZ 6.2287779D 01 | |
| ALT 5.4007140D 05 | LTGD-1.5820963D 01 | LON 1.5701339D 02 | |
| VE 1.0253507D 04 | PTE 1.2676506D 01 | AZE 6.0976073D 01 | |

| | | | |
|----------------------|--------------------|-------------------|---------------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 29 MIN., | 12.435 SEC.,GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 9.5858950D 03 |
| X 3.7011274D 06 | Y-6.0316260D 06 | Z-1.4059239D 06 | |
| DX 9.4585604D 03 | DY 1.1938231D 03 | DZ 4.2671721D 03 | |
| R 7.2149483D 06 | DEC-1.1236699D 01 | RA-5.8465879D 01 | |
| V 1.0445015D 04 | PTH 1.6820504D 01 | AZ 6.0317184D 01 | |
| ALT 8.3759942D 05 | LTGD-1.1301860D 01 | LON 1.6496320D 02 | |
| VE 1.0019973D 04 | PTE 1.7522923D 01 | AZE 5.8766778D 01 | |

| | | | |
|----------------------|--------------------|-------------------|---------------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 31 MIN., | 4.935 SEC.,GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 9.6983950D 03 |
| X 4.7393209D 06 | Y-5.8590087D 06 | Z-9.1785078D 05 | |
| DX 8.9909217D 03 | DY 1.8549287D 03 | DZ 4.3973279D 03 | |
| R 7.5915476D 06 | DEC-6.9442950D 00 | RA-5.1030786D 01 | |
| V 1.0179093D 04 | PTH 2.1010976D 01 | AZ 5.9138475D 01 | |
| ALT 1.2136973D 06 | LTGD-6.9831797D 00 | LON 1.7192826D 02 | |
| VE 9.7442867D 03 | PTE 2.1975257D 01 | AZE 5.7337373D 01 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | |
|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 20 HRS., | 32 MIN., | 57.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 9.8108950D | 03 |
| X 5.7231302D 06 | Y-5.6187061D 06 | Z-4.1900628D 05 | | |
| DX 8.4974439D 03 | DY 2.3980497D 03 | DZ 4.4613531D 03 | | |
| R 8.0311671D 06 | DEC-2.9906232D 00 | RA-4.4472491D 01 | | |
| V 9.8924651D 03 | PTH 2.4771451D 01 | AZ 5.8968908D 01 | | |
| ALT 1.6530614D 06 | LTGD-3.0065763D 00 | LON 1.7801652D 02 | | |
| VE 9.4465936D 03 | PTE 2.6017017D 01 | AZE 5.6503452D 01 | | |

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|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 20 HRS., | 34 MIN., | 49.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 9.9233950D | 03 |
| X 6.6513597D 06 | Y-5.3234968D 06 | Z 8.4077543D 04 | | |
| DX 8.0066422D 03 | DY 2.8333540D 03 | DZ 4.4752841D 03 | | |
| R 8.5198166D 06 | DEC 5.6543075D-01 | RA-3.8672457D 01 | | |
| V 9.6001241D 03 | PTH 2.8118507D 01 | AZ 5.8445855D 01 | | |
| ALT 2.1416546D 06 | LTGD 5.6827814D-01 | LON 1.8334652D 02 | | |
| VE 9.1424039D 03 | PTE 2.9664254D 01 | AZE 5.6101875D 01 | | |

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|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 20 HRS., | 36 MIN., | 42.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.0035895D | 04 |
| X 7.5254043D 06 | Y-4.9846664D 06 | Z 5.8659543D 05 | | |
| DX 7.5363510D 03 | DY 3.1762807D 03 | DZ 4.4534570D 03 | | |
| R 9.0455902D 06 | DEC 3.7181700D 00 | RA-3.3519635D 01 | | |
| V 9.3122836D 03 | PTH 3.1086915D 01 | AZ 5.8638859D 01 | | |
| ALT 2.6675164D 06 | LTGD 3.7357516D 00 | LON 1.8802931D 02 | | |
| VE 8.8423474D 03 | PTE 3.2951103D 01 | AZE 5.6002442D 01 | | |

| | | | | |
|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 20 HRS., | 38 MIN., | 34.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.0148395D | 04 |
| X 8.3481724D 06 | Y-4.6116840D 06 | Z 1.0851989D 06 | | |
| DX 7.0961067D 03 | DY 3.4431477D 03 | DZ 4.4073600D 03 | | |
| R 9.5988160D 06 | DEC 6.4914813D 00 | RA-2.8917066D 01 | | |
| V 9.0351989D 03 | PTH 3.3718713D 01 | AZ 5.9049171D 01 | | |
| ALT 3.2209260D 06 | LTGD 6.5202322D 00 | LON 1.9216185D 02 | | |
| VE 8.5529946D 03 | PTE 3.5918889D 01 | AZE 5.6107063D 01 | | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 31 MARCH 1968 20 HRS., 40 MIN., 27.435 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0260895D 04
 X 9.1233060D 06 Y-4.2122480D 06 Z 1.5776674D 06
 DX 6.6898239D 03 DY 3.6488743D 03 DZ 4.3456067D 03
 R 1.0171862D 07 DEC 8.9226613D 00 RA-2.4782860D 01
 V 8.7722475D 03 PTH 3.6056479D 01 AZ 5.9604526D 01
 ALT 3.7942138D 06 LTGD 8.9596583D 00 LON 1.9582602D 02
 VE 8.2779523D 03 PTE 3.8609400D 01 AZE 5.6344241D 01

TIME 31 MARCH 1968 20 HRS., 42 MIN., 19.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0373395D 04
 X 9.8546763D 06 Y-3.7925023D 06 Z 2.0626076D 06
 DX 6.3179739D 03 DY 3.8061186D 03 DZ 4.2743835D 03
 R 1.0758814D 07 DEC 1.1052786D 01 RA-2.1048865D 01
 V 8.5248863D 03 PTH 3.8139829D 01 AZ 6.0253085D 01
 ALT 4.3814371D 06 LTGD 1.1095728D 01 LON 1.9908998D 02
 VE 8.0188400D 03 PTE 4.1061399D 01 AZE 5.6662838D 01

TIME 31 MARCH 1968 20 HRS., 44 MIN., 12.435 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0485895D 04
 X 1.0546088D 07 Y-3.3573004D 06 Z 2.5392121D 06
 DX 5.9791077D 03 DY 3.9251842D 03 DZ 4.1980062D 03
 R 1.1355133D 07 DEC 1.2921624D 01 RA-1.7658642D 01
 V 8.2933742D 03 PTH 4.0003948D 01 AZ 6.0958121D 01
 ALT 4.9780400D 06 LTGD 1.2968742D 01 LON 2.0201017D 02
 VE 7.7760287D 03 PTE 4.3309183D 01 AZE 5.7026657D 01

TIME 31 MARCH 1968 20 HRS., 46 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0598395D 04
 X 1.1201123D 07 Y-2.9104581D 06 Z 3.0070773D 06
 DX 5.6708309D 03 DY 4.0142658D 03 DZ 4.1194187D 03
 R 1.1957359D 07 DEC 1.4565309D 01 RA-1.4565428D 01
 V 8.0772683D 03 PTH 4.1679283D 01 AZ 6.1693841D 01
 ALT 5.5805498D 06 LTGD 1.4615266D 01 LON 2.0463335D 02
 VE 7.5491514D 03 PTE 4.5382307D 01 AZE 5.7410228D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | |
|----------------------|----------|-----------------|------------------------|-------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 47 MIN., | 57.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.0710895D | 04 |
| X 1.1823069D | 07 | Y-2.4549718D | 06 | Z 3.4660730D 06 |
| DX 5.3903863D | 03 | DY 4.0798001D | 03 | DZ 4.0405890D 03 |
| R 1.2562862D | 07 | DEC 1.6015557D | 01 | RA-1.1730349D 01 |
| V 7.8757471D | 03 | PTH 4.3191801D | 01 | AZ 6.2442264D 01 |
| ALT 6.1863283D | 06 | LTGD 1.6067353D | 01 | LUN 2.0699840D 02 |
| VE 7.3374359D | 03 | PTE 4.7305860D | 01 | AZE 5.7795673D 01 |

| | | | | |
|----------------------|----------|-----------------|------------------------|-------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 49 MIN., | 49.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.0823395D | 04 |
| X 1.2414899D | 07 | Y-1.9931962D | 06 | Z 3.9162496D 06 |
| DX 5.1349825D | 03 | DY 4.1268140D | 03 | DZ 3.9628039D 03 |
| R 1.3169645D | 07 | DEC 1.7299671D | 01 | RA-9.1209288D 00 |
| V 7.6878120D | 03 | PTH 4.4563489D | 01 | AZ 6.3190967D 01 |
| ALT 6.7933746D | 06 | LTGD 1.7352561D | 01 | LON 2.0913778D 02 |
| VE 7.1399147D | 03 | PTE 4.9100983D | 01 | AZE 5.8170456D 01 |

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|----------------------|----------|-----------------|------------------------|-------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 51 MIN., | 42.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.0935895D | 04 |
| X 1.2979279D | 07 | Y-1.5269851D | 06 | Z 4.3577741D 06 |
| DX 4.9019664D | 03 | DY 4.1592279D | 03 | DZ 3.8868796D 03 |
| R 1.3776196D | 07 | DEC 1.8440904D | 01 | RA-6.7098847D 00 |
| V 7.5124087D | 03 | PTH 4.5812901D | 01 | AZ 6.3931469D 01 |
| ALT 7.4001738D | 06 | LTGD 1.8494336D | 01 | LON 2.1107879D 02 |
| VE 6.9555514D | 03 | PTE 5.0785430D | 01 | AZE 5.8525776D 01 |

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|----------------------|----------|-----------------|------------------------|-------------------|
| TIME 31 MARCH 1968 | 20 HRS., | 53 MIN., | 34.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.1048395D | 04 |
| X 1.3518589D | 07 | Y-1.0578018D | 06 | Z 4.7908861D 06 |
| DX 4.6889028D | 03 | DY 4.1801020D | 03 | DZ 3.8133108D 03 |
| R 1.4381369D | 07 | DEC 1.9458950D | 01 | RA-4.4741603D 00 |
| V 7.3484966D | 03 | PTH 4.6955700D | 01 | AZ 6.4658082D 01 |
| ALT 8.0055810D | 06 | LTGD 1.9512518D | 01 | LON 2.1284448D 02 |
| VE 6.7833144D | 03 | PTE 5.2374103D | 01 | AZE 5.8855432D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 31 MARCH 1968 20 HRS., 55 MIN., 27.435 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.1160895D 04
X 1.4034948D 07 Y-5.8680441D 05 Z 5.2158679D 06
DX 4.4936023D 03 DY 4.1918324D 03 DZ 3.7423736D 03
R 1.4984305D 07 DEC 2.0370458D 01 RA-2.3941552D 00
V 7.1950872D 03 PTH 4.8005129D 01 AZ 6.5367100D 01
ALT 8.6087340D 06 LTGD 2.0423864D 01 LON 2.1445446D 02
VE 6.6222177D 03 PTE 5.3879532D 01 AZE 5.9155011D 01

TIME 31 MARCH 1968 20 HRS., 57 MIN., 19.935 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.1273395D 04
X 1.4530243D 07 Y-1.1491137D 05 Z 5.6330238D 06
DX 4.3141200D 03 DY 4.1963014D 03 DZ 3.6741969D 03
R 1.5584355D 07 DEC 2.1189503D 01 RA-4.5311005D-01
V 7.0512622D 03 PTH 4.8972415D 01 AZ 6.6056220D 01
ALT 9.2089867D 06 LTGD 2.1242530D 01 LON 2.1592547D 02
VE 6.4713413D 03 PTE 5.5312271D 01 AZE 5.9421323D 01

TIME 31 MARCH 1968 20 HRS., 59 MIN., 12.435 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.1385895D 04
X 1.5006154D 07 Y 3.5714719D 05 Z 6.0426669D 06
DX 4.1487409D 03 DY 4.1949946D 03 DZ 3.6088118D 03
R 1.6181039D 07 DEC 2.1928002D 01 RA 1.3633849D 00
V 6.9161806D 03 PTH 4.9867112D 01 AZ 6.6724133D 01
ALT 9.8058594D 06 LTGD 2.1980495D 01 LON 2.1727193D 02
VE 6.3298394D 03 PTE 5.6681241D 01 AZE 5.9651981D 01

TIME 31 MARCH 1968 21 HRS., 1 MIN., 4.935 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.1498395D 04
X 1.5464181D 07 Y 8.2879027D 05 Z 6.4451100D 06
DX 3.9959587D 03 DY 4.1890893D 03 DZ 3.5461853D 03
R 1.6774005D 07 DEC 2.2596071D 01 RA 3.0677857D 00
V 6.7890784D 03 PTH 5.0697385D 01 AZ 6.7370227D 01
ALT 1.0399000D 07 LTGD 2.2647919D 01 LON 2.1850630D 02
VE 6.1969415D 03 PTE 5.7994004D 01 AZE 5.9845105D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | |
|----------------------|--------------------|-------------------|--------------|---------------|
| TIME 31 MARCH 1968 | 21 HRS., | 2 MIN., | 57.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 1.1610895D 04 |
| X 1.5905667D 07 | Y 1.2995552D 06 | Z 6.8406593D 06 | | |
| DX 3.8544522D 03 | DY 4.1795231D 03 | DZ 3.4862434D 03 | | |
| R 1.7362998D 07 | DEC 2.3202320D 01 | RA 4.6709140D 00 | | |
| V 6.6692660D 03 | PTH 5.1470236D 01 | AZ 6.7994381D 01 | | |
| ALT 1.0988155D 07 | LTGD 2.3253447D 01 | LON 2.1963939D 02 | | |
| VE 6.0719501D 03 | PTE 5.9256989D 01 | AZE 5.9999099D 01 | | |

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|----------------------|--------------------|-------------------|--------------|---------------|
| TIME 31 MARCH 1968 | 21 HRS., | 4 MIN., | 49.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 1.1723395D 04 |
| X 1.6331812D 07 | Y 1.7690740D 06 | Z 7.2296117D 06 | | |
| DX 3.7230634D 03 | DY 4.1670456D 03 | DZ 3.4288871D 03 | | |
| R 1.7947841D 07 | DEC 2.3754107D 01 | RA 6.1822165D 00 | | |
| V 6.5561221D 03 | PTH 5.2191703D 01 | AZ 6.8596814D 01 | | |
| ALT 1.1573149D 07 | LTGD 2.3804463D 01 | LON 2.2068066D 02 | | |
| VE 5.9542354D 03 | PTE 6.0475683D 01 | AZE 6.0112486D 01 | | |

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|----------------------|--------------------|-------------------|--------------|---------------|
| TIME 31 MARCH 1968 | 21 HRS., | 6 MIN., | 42.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 1.1835895D 04 |
| X 1.6743697D 07 | Y 2.2370541D 06 | Z 7.6122517D 06 | | |
| DX 3.6007762D 03 | DY 4.1522590D 03 | DZ 3.3740034D 03 | | |
| R 1.8528416D 07 | DEC 2.4257739D 01 | RA 7.6099774D 00 | | |
| V 6.4490885D 03 | PTH 5.2867007D 01 | AZ 6.9177974D 01 | | |
| ALT 1.2153863D 07 | LTGD 2.4307291D 01 | LON 2.2163839D 02 | | |
| VE 5.8432298D 03 | PTE 6.1654776D 01 | AZE 6.0183776D 01 | | |

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|----------------------|--------------------|-------------------|--------------|---------------|
| TIME 31 MARCH 1968 | 21 HRS., | 8 MIN., | 34.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 1.1948395D 04 |
| X 1.7142295D 07 | Y 2.7032640D 06 | Z 7.9888507D 06 | | |
| DX 3.4866981D 03 | DY 4.1356485D 03 | DZ 3.3214721D 03 | | |
| R 1.9104650D 07 | DEC 2.4718640D 01 | RA 8.9614920D 00 | | |
| V 6.3476633D 03 | PTH 5.3500690D 01 | AZ 6.9738463D 01 | | |
| ALT 1.2730226D 07 | LTGD 2.4767373D 01 | LON 2.2251987D 02 | | |
| VE 5.7384223D 03 | PTE 6.2798290D 01 | AZE 6.0211357D 01 | | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | |
|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 21 HRS., | 10 MIN., | 27.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.2060895D | 04 |
| X 1.7528483D 07 | Y 3.1675214D 06 | Z 8.3596665D 06 | | |
| DX 3.3800435D 03 | DY 4.1176071D 03 | DZ 3.2711714D 03 | | |
| R 1.9676507D 07 | DEC 2.5141498D 01 | RA 1.0243211D 01 | | |
| V 6.2513954D 03 | PTH 5.4096714D 01 | AZ 7.0278979D 01 | | |
| ALT 1.3302204D 07 | LTGD 2.5189405D 01 | LON 2.2333156D 02 | | |
| VE 5.6393525D 03 | PTE 6.3909675D 01 | AZE 6.0193402D 01 | | |

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|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 21 HRS., | 12 MIN., | 19.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.2173395D | 04 |
| X 1.7903057D 07 | Y 3.6296839D 06 | Z 8.7249434D 06 | | |
| DX 3.2801195D 03 | DY 4.0984535D 03 | DZ 3.2229807D 03 | | |
| R 2.0243979D 07 | DEC 2.5530374D 01 | RA 1.1460860D 01 | | |
| V 6.1598791D 03 | PTH 5.4658550D 01 | AZ 7.0800280D 01 | | |
| ALT 1.3869788D 07 | LTGD 2.5577457D 01 | LON 2.2407917D 02 | | |
| VE 5.5456053D 03 | PTE 6.4991894D 01 | AZE 6.0127785D 01 | | |

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|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 21 HRS., | 14 MIN., | 12.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.2285895D | 04 |
| X 1.8266739D 07 | Y 4.0896415D 06 | Z 9.0849119D 06 | | |
| DX 3.1863137D 03 | DY 4.0784474D 03 | DZ 3.1767829D 03 | | |
| R 2.0807079D 07 | DEC 2.5888803D 01 | RA 1.2619540D 01 | | |
| V 6.0727488D 03 | PTH 5.5189254D 01 | AZ 7.1303147D 01 | | |
| ALT 1.4432993D 07 | LTGD 2.5935069D 01 | LON 2.2476782D 02 | | |
| VE 5.4568062D 03 | PTE 6.6047492D 01 | AZE 6.0011995D 01 | | |

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|----------------------|--------------------|-------------------|------------------------|-----|
| TIME 31 MARCH 1968 | 21 HRS., | 16 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 1.2398395D | 04 |
| X 1.8620186D 07 | Y 4.5473106D 06 | Z 9.4397900D 06 | | |
| DX 3.0980830D 03 | DY 4.0578005D 03 | DZ 3.1324656D 03 | | |
| R 2.1365838D 07 | DEC 2.6219868D 01 | RA 1.3723809D 01 | | |
| V 5.9896748D 03 | PTH 5.5691522D 01 | AZ 7.1788374D 01 | | |
| ALT 1.4991848D 07 | LTGD 2.6265330D 01 | LON 2.2540205D 02 | | |
| VE 5.3726163D 03 | PTE 6.7078647D 01 | AZE 5.9843042D 01 | | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 17 MIN., | 57.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2510895D 04 |
| X | 1.8963999D 07 | Y | 5.0026292D 06 | Z | 9.7897832D 06 |
| DX | 3.0149452D 03 | DY | 4.0366863D 03 | DZ | 3.0899217D 03 |
| R | 2.1920296D 07 | DEC | 2.6526273D 01 | RA | 1.4777756D 01 |
| V | 5.9103593D 03 | PTH | 5.6167744D 01 | AZ | 7.2256743D 01 |
| ALT | 1.5546398D 07 | LTGD | 2.6570945D 01 | LON | 2.2598597D 02 |
| VE | 5.2927292D 03 | PTE | 6.8087216D 01 | AZE | 5.9617364D 01 |

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|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 19 MIN., | 49.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2623395D 04 |
| X | 1.9298724D 07 | Y | 5.4555528D 06 | Z | 1.0135085D 07 |
| DX | 2.9364705D 03 | DY | 4.0152465D 03 | DZ | 3.0490502D 03 |
| R | 2.2470508D 07 | DEC | 2.6810390D 01 | RA | 1.5785057D 01 |
| V | 5.8345326D 03 | PTH | 5.6620046D 01 | AZ | 7.2709025D 01 |
| ALT | 1.6096695D 07 | LTGD | 2.6854290D 01 | LON | 2.2652324D 02 |
| VE | 5.2168666D 03 | PTE | 6.9074771D 01 | AZE | 5.9330704D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 21 MIN., | 42.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2735895D 04 |
| X | 1.9624865D 07 | Y | 5.9060518D 06 | Z | 1.0475879D 07 |
| DX | 2.8622752D 03 | DY | 3.9935976D 03 | DZ | 3.0097556D 03 |
| R | 2.3016533D 07 | DEC | 2.7074315D 01 | RA | 1.6749030D 01 |
| V | 5.7619502D 03 | PTH | 5.7050325D 01 | AZ | 7.3145962D 01 |
| ALT | 1.6642799D 07 | LTGD | 2.7117461D 01 | LON | 2.2701718D 02 |
| VE | 5.1447757D 03 | PTE | 7.0042626D 01 | AZE | 5.8977984D 01 |

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|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 23 MIN., | 34.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2848395D 04 |
| X | 1.9942883D 07 | Y | 6.3541081D 06 | Z | 1.0812336D 07 |
| DX | 2.7920159D 03 | DY | 3.9718350D 03 | DZ | 2.9719488D 03 |
| R | 2.3558436D 07 | DEC | 2.7319897D 01 | RA | 1.7672675D 01 |
| V | 5.6923902D 03 | PTH | 5.7460275D 01 | AZ | 7.3568275D 01 |
| ALT | 1.7184776D 07 | LTGD | 2.7362310D 01 | LON | 2.2747079D 02 |
| VE | 5.0762263D 03 | PTE | 7.0991858D 01 | AZE | 5.8553129D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 25 MIN., | 27.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2960895D 04 |
| X | 2.0253204D 07 | Y | 6.7997134D 06 | Z | 1.1144620D 07 |
| DX | 2.7253841D 03 | DY | 3.9500370D 03 | DZ | 2.9355459D 03 |
| R | 2.4096285D 07 | DEC | 2.7548780D 01 | RA | 1.8558713D 01 |
| V | 5.6256502D 03 | PTH | 5.7851422D 01 | AZ | 7.3976649D 01 |
| ALT | 1.7722695D 07 | LTGD | 2.7590479D 01 | LON | 2.2788679D 02 |
| VE | 5.0110083D 03 | PTE | 7.1923320D 01 | AZE | 5.8048876D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 27 MIN., | 19.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.3073395D 04 |
| X | 2.0556220D 07 | Y | 7.2428675D 06 | Z | 1.1472883D 07 |
| DX | 2.6621026D 03 | DY | 3.9282677D 03 | DZ | 2.9004686D 03 |
| R | 2.4630152D 07 | DEC | 2.7762425D 01 | RA | 1.9409619D 01 |
| V | 5.5615461D 03 | PTH | 5.8225136D 01 | AZ | 7.4371742D 01 |
| ALT | 1.8256627D 07 | LTGD | 2.7803429D 01 | LON | 2.2826766D 02 |
| VE | 4.9489297D 03 | PTE | 7.2837654D 01 | AZE | 5.7456519D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 29 MIN., | 12.435 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.3185895D 04 |
| X | 2.0852294D 07 | Y | 7.6835767D 06 | Z | 1.1797272D 07 |
| DX | 2.6019213D 03 | DY | 3.9065796D 03 | DZ | 2.8666437D 03 |
| R | 2.5160110D 07 | DEC | 2.7962133D 01 | RA | 2.0227647D 01 |
| V | 5.4999095D 03 | PTH | 5.8582656D 01 | AZ | 7.4754178D 01 |
| ALT | 1.8786647D 07 | LTGD | 2.8002464D 01 | LON | 2.2861566D 02 |
| VE | 4.8898145D 03 | PTE | 7.3735283D 01 | AZE | 5.6765599D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 31 MARCH 1968 | 21 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.3298395D 04 |
| X | 2.1141760D 07 | Y | 8.1218526D 06 | Z | 1.2117923D 07 |
| DX | 2.5446139D 03 | DY | 3.8850155D 03 | DZ | 2.8340031D 03 |
| R | 2.5686233D 07 | DEC | 2.8149070D 01 | RA | 2.1014857D 01 |
| V | 5.4405862D 03 | PTH | 5.8925100D 01 | AZ | 7.5124550D 01 |
| ALT | 1.9312828D 07 | LTGD | 2.8188748D 01 | LON | 2.2893284D 02 |
| VE | 4.8335011D 03 | PTE | 7.4616416D 01 | AZE | 5.5963513D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | |
|----------------------|---------------------------|-------------------|----------------|
| TIME 31 MARCH 1968 | 22 HRS., | 1 MIN., | 4.935 SEC.,GMT |
| GEOCENTRIC REFERENCE | FLIGHT TIME 1.5098395D 04 | | |
| X 2.5075632D 07 | Y 1.4822918D 07 | Z 1.6827899D 07 | |
| DX 1.8952609D 03 | DY 3.5716915D 03 | DZ 2.4315277D 03 | |
| R 3.3640518D 07 | DEC 3.0015025D 01 | RA 3.0588537D 01 | |
| V 4.7181904D 03 | PTH 6.2970268D 01 | AZ 7.9788196D 01 | |
| ALT 2.7267702D 07 | LTGD 3.0046566D 01 | LON 2.3098598D 02 | |
| VE 4.2200058D 03 | PTE 8.4859834D 01 | AZE-2.1070956D 00 | |

| | | | |
|----------------------|---------------------------|-------------------|----------------|
| TIME 31 MARCH 1968 | 22 HRS., | 31 MIN., | 4.935 SEC.,GMT |
| GEOCENTRIC REFERENCE | FLIGHT TIME 1.6898395D 04 | | |
| X 2.8125073D 07 | Y 2.1019507D 07 | Z 2.0952936D 07 | |
| DX 1.5222138D 03 | DY 3.3232016D 03 | DZ 2.1679164D 03 | |
| R 4.0888445D 07 | DEC 3.0826593D 01 | RA 3.6772904D 01 | |
| V 4.2497841D 03 | PTH 6.5474047D 01 | AZ 8.2922792D 01 | |
| ALT 3.4515893D 07 | LTGD 3.0852954D 01 | LON 2.2964982D 02 | |
| VE 3.9561959D 03 | PTE 7.7772014D 01 | AZE-7.5092106D 01 | |

| | | | |
|----------------------|---------------------------|-------------------|----------------|
| TIME 31 MARCH 1968 | 23 HRS., | 1 MIN., | 4.935 SEC.,GMT |
| GEOCENTRIC REFERENCE | FLIGHT TIME 1.8698395D 04 | | |
| X 3.0630942D 07 | Y 2.6816495D 07 | Z 2.4676112D 07 | |
| DX 1.2772170D 03 | DY 3.1249275D 03 | DZ 1.9781965D 03 | |
| R 4.7605562D 07 | DEC 3.1221311D 01 | RA 4.1201197D 01 | |
| V 3.9127633D 03 | PTH 6.7216958D 01 | AZ 8.5206608D 01 | |
| ALT 4.1233140D 07 | LTGD 3.1244117D 01 | LON 2.2655758D 02 | |
| VE 3.8933329D 03 | PTE 6.7909651D 01 | AZE-8.5095533D 01 | |

| | | | |
|----------------------|---------------------------|-------------------|----------------|
| TIME 31 MARCH 1968 | 23 HRS., | 31 MIN., | 4.935 SEC.,GMT |
| GEOCENTRIC REFERENCE | FLIGHT TIME 2.0498395D 04 | | |
| X 3.2764683D 07 | Y 3.2290730D 07 | Z 2.8100905D 07 | |
| DX 1.1024980D 03 | DY 2.9626178D 03 | DZ 1.8330045D 03 | |
| R 5.3906183D 07 | DEC 3.1419008D 01 | RA 4.4582584D 01 | |
| V 3.6541089D 03 | PTH 6.8519366D 01 | AZ 8.6965292D 01 | |
| ALT 4.7533826D 07 | LTGD 3.1439220D 01 | LON 2.2241843D 02 | |
| VE 3.9548363D 03 | PTE 5.9292889D 01 | AZE-8.8023867D 01 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------------------------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 0 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 2.2298395D 04 | | | |
| X | 3.4625495D 07 | Y | 3.7497586D 07 | Z | 3.1292346D 07 |
| DX | 9.7076588D 02 | DY | 2.8265238D 03 | DZ | 1.7170427D 03 |
| R | 5.9868228D 07 | DEC | 3.1512663D 01 | RA | 4.7280429D 01 |
| V | 3.4467172D 03 | PTH | 6.9539783D 01 | AZ | 8.8374342D 01 |
| ALT | 5.3495902D 07 | LTGD | 3.1530892D 01 | LON | 2.1759574D 02 |
| VE | 4.0947777D 03 | PTE | 5.2058295D 01 | AZE | -8.9245520D 01 |

| | | | | | |
|----------------------|---------------|---------------------------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 0 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 2.4098395D 04 | | | |
| X | 3.6276337D 07 | Y | 4.2477981D 07 | Z | 3.4294439D 07 |
| DX | 8.6738487D 02 | DY | 2.7101043D 03 | DZ | 1.6214867D 03 |
| R | 6.5547388D 07 | DEC | 3.1547192D 01 | RA | 4.9502560D 01 |
| V | 3.2750941D 03 | PTH | 7.0366744D 01 | AZ | 8.9537158D 01 |
| ALT | 5.9175073D 07 | LTGD | 3.1563851D 01 | LON | 2.1229734D 02 |
| VE | 4.2841653D 03 | PTE | 4.6056253D 01 | AZE | -8.9845968D 01 |

| | | | | | |
|----------------------|---------------|---------------------------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 1 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 2.5898395D 04 | | | |
| X | 3.7759878D 07 | Y | 4.7263044D 07 | Z | 3.7138613D 07 |
| DX | 7.8376715D 02 | DY | 2.6088655D 03 | DZ | 1.5408482D 03 |
| R | 7.0985071D 07 | DEC | 3.1546410D 01 | RA | 5.1377580D 01 |
| V | 3.1296459D 03 | PTH | 7.1054096D 01 | AZ | 9.0518952D 01 |
| ALT | 6.4612755D 07 | LTGD | 3.1561793D 01 | LON | 2.0665183D 02 |
| VE | 4.5044515D 03 | PTE | 4.1082809D 01 | AZE | -9.0168714D 01 |

| | | | | | |
|----------------------|---------------|---------------------------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 1 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 2.7698395D 04 | | | |
| X | 3.9106488D 07 | Y | 5.1877080D 07 | Z | 3.9848253D 07 |
| DX | 7.1452338D 02 | DY | 2.5196264D 03 | DZ | 1.4715124D 03 |
| R | 7.6213070D 07 | DEC | 3.1523837D 01 | RA | 5.2989921D 01 |
| V | 3.0040655D 03 | PTH | 7.1636732D 01 | AZ | 9.1363099D 01 |
| ALT | 6.9840747D 07 | LTGD | 3.1538158D 01 | LON | 2.0074364D 02 |
| VE | 4.7437073D 03 | PTE | 3.6943351D 01 | AZE | -9.0350998D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 2 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.9498395D 04 |
| X | 4.0338627D 07 | Y | 5.6339497D 07 | Z | 4.2441331D 07 |
| DX | 6.5609048D 02 | DY | 2.4400704D 03 | DZ | 1.4109885D 03 |
| R | 8.1256448D 07 | DEC | 3.1487556D 01 | RA | 5.4397638D 01 |
| V | 2.8940088D 03 | PTH | 7.2138398D 01 | AZ | 9.2099688D 01 |
| ALT | 7.4884112D 07 | LTGD | 3.1500979D 01 | LON | 1.9463082D 02 |
| VE | 4.9942133D 03 | PTE | 3.3472754D 01 | AZE | -9.0456165D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 2 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.1298395D 04 |
| X | 4.1473413D 07 | Y | 6.0666097D 07 | Z | 4.4932021D 07 |
| DX | 6.0601266D 02 | DY | 2.3684671D 03 | DZ | 1.3574965D 03 |
| R | 8.6135392D 07 | DEC | 3.1442599D 01 | RA | 5.5642153D 01 |
| V | 2.7963699D 03 | PTH | 7.2575894D 01 | AZ | 9.2750336D 01 |
| ALT | 7.9763042D 07 | LTGD | 3.1455252D 01 | LON | 1.8835480D 02 |
| VE | 5.2509364D 03 | PTE | 3.0537951D 01 | AZE | -9.0516492D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 3 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.3098395D 04 |
| X | 4.2524226D 07 | Y | 6.4869952D 07 | Z | 4.7331744D 07 |
| DX | 5.6253873D 02 | DY | 2.3034947D 03 | DZ | 1.3097256D 03 |
| R | 9.0866465D 07 | DEC | 3.1392198D 01 | RA | 5.6753937D 01 |
| V | 2.7088593D 03 | PTH | 7.2961491D 01 | AZ | 9.3331019D 01 |
| ALT | 8.4494097D 07 | LTGD | 3.1404181D 01 | LON | 1.8194605D 02 |
| VE | 5.5105691D 03 | PTE | 2.8034119D 01 | AZE | -9.0549653D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 3 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.4898395D 04 |
| X | 4.3501738D 07 | Y | 6.8962034D 07 | Z | 4.9649868D 07 |
| DX | 5.2438407D 02 | DY | 2.2441239D 03 | DZ | 1.2666858D 03 |
| R | 9.5463463D 07 | DEC | 3.1338480D 01 | RA | 5.7755978D 01 |
| V | 2.6297460D 03 | PTH | 7.3304392D 01 | AZ | 9.3853838D 01 |
| ALT | 8.9091077D 07 | LTGD | 3.1349875D 01 | LON | 1.7542756D 02 |
| VE | 5.7709240D 03 | PTE | 2.5879336D 01 | AZE | -9.0565865D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 4 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.6698395D 04 |
| X | 4.4414617D 07 | Y | 7.2951666D 07 | Z | 5.1894191D 07 |
| DX | 4.9058349D 02 | DY | 2.1895393D 03 | DZ | 1.2276137D 03 |
| R | 9.9938035D 07 | DEC | 3.1282871D 01 | RA | 5.8666001D 01 |
| V | 2.5576923D 03 | PTH | 7.3611655D 01 | AZ | 9.4328144D 01 |
| ALT | 9.3565631D 07 | LTGD | 3.1293745D 01 | LON | 1.6881705D 02 |
| VE | 6.0305497D 03 | PTE | 2.4009577D 01 | AZE- | 9.0571292D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 4 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.8498395D 04 |
| X | 4.5270004D 07 | Y | 7.6846852D 07 | Z | 5.4071295D 07 |
| DX | 4.6039674D 02 | DY | 2.1390852D 03 | DZ | 1.1919091D 03 |
| R | 1.0430013D 08 | DEC | 3.1226340D 01 | RA | 5.9497922D 01 |
| V | 2.4916457D 03 | PTH | 7.3888795D 01 | AZ | 9.4761298D 01 |
| ALT | 9.7927706D 07 | LTGD | 3.1236748D 01 | LON | 1.6212844D 02 |
| VE | 6.2884837D 03 | PTE | 2.2374583D 01 | AZE- | 9.0569779D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 5 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.0298395D 04 |
| X | 4.6073864D 07 | Y | 8.0654529D 07 | Z | 5.6186795D 07 |
| DX | 4.3324594D 02 | DY | 2.0922274D 03 | DZ | 1.1590933D 03 |
| R | 1.0855832D 08 | DEC | 3.1169553D 01 | RA | 6.0262848D 01 |
| V | 2.4307643D 03 | PTH | 7.4140200D 01 | AZ | 9.5159183D 01 |
| ALT | 1.0218588D 08 | LTGD | 3.1179542D 01 | LON | 1.5537283D 02 |
| VE | 6.5440930D 03 | PTE | 2.0934642D 01 | AZE- | 9.0563791D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 5 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.2098395D 04 |
| X | 4.6831234D 07 | Y | 8.4380763D 07 | Z | 5.8245530D 07 |
| DX | 4.0867289D 02 | DY | 2.0485256D 03 | DZ | 1.1287785D 03 |
| R | 1.1272009D 08 | DEC | 3.1112967D 01 | RA | 6.0969768D 01 |
| V | 2.3743655D 03 | PTH | 7.4369402D 01 | AZ | 9.5526568D 01 |
| ALT | 1.0634763D 08 | LTGD | 3.1122577D 01 | LON | 1.4855922D 02 |
| VE | 6.7969682D 03 | PTE | 1.9658124D 01 | AZE- | 9.0554939D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|---------------------------|----------------|
| TIME | 1 APRIL 1968 | 6 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 4.3898395D 04 | |
| X | 4.7546411D 07 | Y | 8.8030893D 07 | Z | 6.0251706D 07 |
| DX | 3.8630924D 02 | DY | 2.0076127D 03 | DZ | 1.1006468D 03 |
| R | 1.1679198D 08 | DEC | 3.1056898D 01 | RA | 6.1626048D 01 |
| V | 2.3218886D 03 | PTH | 7.4579290D 01 | AZ | 9.5867361D 01 |
| ALT | 1.1041950D 08 | LTGD | 3.1066163D 01 | LON | 1.4169496D 02 |
| VE | 7.0468538D 03 | PTE | 1.8519629D 01 | AZE | -9.0544296D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|---------------------------|----------------|
| TIME | 1 APRIL 1968 | 6 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 4.5698395D 04 | |
| X | 4.8223092D 07 | Y | 9.1609655D 07 | Z | 6.2209010D 07 |
| DX | 3.6585528D 02 | DY | 1.9691800D 03 | DZ | 1.0744349D 03 |
| R | 1.2077978D 08 | DEC | 3.1001560D 01 | RA | 6.2237791D 01 |
| V | 2.2728683D 03 | PTH | 7.4772248D 01 | AZ | 9.6184805D 01 |
| ALT | 1.1440729D 08 | LTGD | 3.1010510D 01 | LON | 1.3478617D 02 |
| VE | 7.2936000D 03 | PTE | 1.7498588D 01 | AZE | -9.0532586D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|---------------------------|----------------|
| TIME | 1 APRIL 1968 | 7 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 4.7498395D 04 | |
| X | 4.8864487D 07 | Y | 9.5121272D 07 | Z | 6.4120691D 07 |
| DX | 3.4706446D 02 | DY | 1.9329659D 03 | DZ | 1.0499225D 03 |
| R | 1.2468864D 08 | DEC | 3.0947098D 01 | RA | 6.2810102D 01 |
| V | 2.2269145D 03 | PTH | 7.4950265D 01 | AZ | 9.6481615D 01 |
| ALT | 1.1831613D 08 | LTGD | 3.0955759D 01 | LON | 1.2783795D 02 |
| VE | 7.5371309D 03 | PTE | 1.6578207D 01 | AZE | -9.0520299D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|---------------------------|----------------|
| TIME | 1 APRIL 1968 | 7 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 4.9298395D 04 | |
| X | 4.9473399D 07 | Y | 9.8569529D 07 | Z | 6.5989638D 07 |
| DX | 3.2973193D 02 | DY | 1.8987463D 03 | DZ | 1.0269234D 03 |
| R | 1.2852316D 08 | DEC | 3.0893606D 01 | RA | 6.3347294D 01 |
| V | 2.1836969D 03 | PTH | 7.5115018D 01 | AZ | 9.6760083D 01 |
| ALT | 1.2215062D 08 | LTGD | 3.0902000D 01 | LON | 1.2085461D 02 |
| VE | 7.7774215D 03 | PTE | 1.5744665D 01 | AZE | -9.0507772D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 8 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.1098395D 04 |
| X | 5.0052293D 07 | Y | 1.0195784D 08 | Z | 6.7818428D 07 |
| DX | 3.1368604D 02 | DY | 1.8663286D 03 | DZ | 1.0052793D 03 |
| R | 1.3228746D 08 | DEC | 3.0841141D 01 | RA | 6.3853036D 01 |
| V | 2.1429344D 03 | PTH | 7.5267929D 01 | AZ | 9.7022163D 01 |
| ALT | 1.2591491D 08 | LTGD | 3.0849289D 01 | LON | 1.1383982D 02 |
| VE | 8.0144825D 03 | PTE | 1.4986503D 01 | AZE | -9.0495232D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 8 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.2898395D 04 |
| X | 5.0603353D 07 | Y | 1.0528929D 08 | Z | 6.9609375D 07 |
| DX | 2.9878175D 02 | DY | 1.8355457D 03 | DZ | 9.8485438D 02 |
| R | 1.3598529D 08 | DEC | 3.0789736D 01 | RA | 6.4330474D 01 |
| V | 2.1043851D 03 | PTH | 7.5410214D 01 | AZ | 9.7269528D 01 |
| ALT | 1.2961272D 08 | LTGD | 3.0797654D 01 | LON | 1.0679673D 02 |
| VE | 8.2483488D 03 | PTE | 1.4294150D 01 | AZE | -9.0482835D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 9 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.4698395D 04 |
| X | 5.1128518D 07 | Y | 1.0856670D 08 | Z | 7.1364565D 07 |
| DX | 2.8489558D 02 | DY | 1.8062521D 03 | DZ | 9.6553137D 02 |
| R | 1.3962003D 08 | DEC | 3.0739401D 01 | RA | 6.4782324D 01 |
| V | 2.0678402D 03 | PTH | 7.5542921D 01 | AZ | 9.7503624D 01 |
| ALT | 1.3324745D 08 | LTGD | 3.0747106D 01 | LON | 9.9728042D 01 |
| VE | 8.4790720D 03 | PTE | 1.3659559D 01 | AZE | -9.0470684D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 9 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.6498395D 04 |
| X | 5.1629524D 07 | Y | 1.1179262D 08 | Z | 7.3085887D 07 |
| DX | 2.7192176D 02 | DY | 1.7783201D 03 | DZ | 9.4720850D 02 |
| R | 1.4319478D 08 | DEC | 3.0690138D 01 | RA | 6.5210943D 01 |
| V | 2.0331177D 03 | PTH | 7.5666958D 01 | AZ | 9.7725708D 01 |
| ALT | 1.3682218D 08 | LTGD | 3.0697643D 01 | LON | 9.2636128D 01 |
| VE | 8.7067145D 03 | PTE | 1.3075921D 01 | AZE | -9.0458848D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 10 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.8298395D 04 |
| X | 5.2107929D 07 | Y | 1.1496940D 08 | Z | 7.4775062D 07 |
| DX | 2.5976906D 02 | DY | 1.7516372D 03 | DZ | 9.2979684D 02 |
| R | 1.4671233D 08 | DEC | 3.0641934D 01 | RA | 6.5618393D 01 |
| V | 2.0000588D 03 | PTH | 7.5783118D 01 | AZ | 9.7936877D 01 |
| ALT | 1.4033972D 08 | LTGD | 3.0649253D 01 | LON | 8.5523045D 01 |
| VE | 8.9313460D 03 | PTE | 1.2537438D 01 | AZE- | 9.0447369D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 10 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 6.0098395D 04 |
| X | 5.2565138D 07 | Y | 1.1809920D 08 | Z | 7.6433656D 07 |
| DX | 2.4835838D 02 | DY | 1.7261040D 03 | DZ | 9.1321834D 02 |
| R | 1.5017529D 08 | DEC | 3.0594774D 01 | RA | 6.6006481D 01 |
| V | 1.9685235D 03 | PTH | 7.5892095D 01 | AZ | 9.8138096D 01 |
| ALT | 1.4380266D 08 | LTGD | 3.0601917D 01 | LON | 7.8390599D 01 |
| VE | 9.1530402D 03 | PTE | 1.2039149D 01 | AZE- | 9.0436271D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 11 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 6.1898395D 04 |
| X | 5.3002423D 07 | Y | 1.2118401D 08 | Z | 7.8063106D 07 |
| DX | 2.3762077D 02 | DY | 1.7016319D 03 | DZ | 8.9740414D 02 |
| R | 1.5358603D 08 | DEC | 3.0548633D 01 | RA | 6.6376802D 01 |
| V | 1.9383883D 03 | PTH | 7.5994498D 01 | AZ | 9.8330215D 01 |
| ALT | 1.4721339D 08 | LTGD | 3.0555612D 01 | LON | 7.1240388D 01 |
| VE | 9.3718729D 03 | PTE | 1.1576782D 01 | AZE- | 9.0425567D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 11 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 6.3698395D 04 |
| X | 5.3420940D 07 | Y | 1.2422566D 08 | Z | 7.9664733D 07 |
| DX | 2.2749580D 02 | DY | 1.6781420D 03 | DZ | 8.8229321D 02 |
| R | 1.5694675D 08 | DEC | 3.0503488D 01 | RA | 6.6730772D 01 |
| V | 1.9095435D 03 | PTH | 7.6090871D 01 | AZ | 9.8513989D 01 |
| ALT | 1.5057409D 08 | LTGD | 3.0510311D 01 | LON | 6.4073824D 01 |
| VE | 9.5879206D 03 | PTE | 1.1146643D 01 | AZE- | 9.0415260D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 12 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 6.5498395D 04 |
| X | 5.3821743D 07 | Y | 1.2722587D 08 | Z | 8.1239751D 07 |
| DX | 2.1793032D 02 | DY | 1.6555636D 03 | DZ | 8.6783124D 02 |
| R | 1.6025947D 08 | DEC | 3.0459310D 01 | RA | 6.7069647D 01 |
| V | 1.8819914D 03 | PTH | 7.6181693D 01 | AZ | 9.8690090D 01 |
| ALT | 1.5388680D 08 | LTGD | 3.0465987D 01 | LON | 5.6892167D 01 |
| VE | 9.8012592D 03 | PTE | 1.0745522D 01 | AZE- | 9.0405346D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 12 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 6.7298395D 04 |
| X | 5.4205796D 07 | Y | 1.3018620D 08 | Z | 8.2789285D 07 |
| DX | 2.0887733D 02 | DY | 1.6338329D 03 | DZ | 8.5396972D 02 |
| R | 1.6352609D 08 | DEC | 3.0415072D 01 | RA | 6.7394553D 01 |
| V | 1.8553447D 03 | PTH | 7.6267393D 01 | AZ | 9.8859119D 01 |
| ALT | 1.5715340D 08 | LTGD | 3.0422609D 01 | LON | 4.9696540D 01 |
| VE | 1.0011964D 04 | PTE | 1.0370614D 01 | AZE- | 9.0395817D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 13 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 6.9098395D 04 |
| X | 5.4573984D 07 | Y | 1.3310814D 08 | Z | 8.4314376D 07 |
| DX | 2.0029513D 02 | DY | 1.6128926D 03 | DZ | 8.4066516D 02 |
| R | 1.6674834D 08 | DEC | 3.0373742D 01 | RA | 6.7706497D 01 |
| V | 1.8298247D 03 | PTH | 7.6348355D 01 | AZ | 9.9021616D 01 |
| ALT | 1.6037564D 08 | LTGD | 3.0380148D 01 | LON | 4.2487951D 01 |
| VE | 1.0220107D 04 | PTE | 1.0019464D 01 | AZE- | 9.0386663D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 1 APRIL 1968 | 13 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 7.0898395D 04 |
| X | 5.4927119D 07 | Y | 1.3599306D 08 | Z | 8.5815990D 07 |
| DX | 1.9214658D 02 | DY | 1.5926907D 03 | DZ | 8.2787841D 02 |
| R | 1.6992788D 08 | DEC | 3.0332293D 01 | RA | 6.8006387D 01 |
| V | 1.8052608D 03 | PTH | 7.6424926D 01 | AZ | 9.9178066D 01 |
| ALT | 1.6355516D 08 | LTGD | 3.0338573D 01 | LON | 3.5267307D 01 |
| VE | 1.0425761D 04 | PTE | 9.6899091D 00 | AZE- | 9.0377873D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 14 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 7.2698395D 04 | | |
| X | 5.5265952D 07 | Y | 1.3884224D 08 | Z | 8.7295028D 07 |
| DX | 1.8439849D 02 | DY | 1.5731801D 03 | DZ | 8.1557416D 02 |
| R | 1.7306622D 08 | DEC | 3.0291694D 01 | RA | 6.8295040D 01 |
| V | 1.7815891D 03 | PTH | 7.6497416D 01 | AZ | 9.9328908D 01 |
| ALT | 1.6669349D 08 | LTGD | 3.0297855D 01 | LON | 2.8035427D 01 |
| VE | 1.0628995D 04 | PTE | 9.3800394D 00 | AZE | -9.0369432D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 14 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 7.4498395D 04 | | |
| X | 5.5591176D 07 | Y | 1.4165689D 08 | Z | 8.8752328D 07 |
| DX | 1.7702108D 02 | DY | 1.5543179D 03 | DZ | 8.0372044D 02 |
| R | 1.7616478D 08 | DEC | 3.0251917D 01 | RA | 6.8573198D 01 |
| V | 1.7587516D 03 | PTH | 7.6566108D 01 | AZ | 9.9474542D 01 |
| ALT | 1.6979204D 08 | LTGD | 3.0257965D 01 | LON | 2.0793052D 01 |
| VE | 1.0829875D 04 | PTE | 9.0881615D 00 | AZE | -9.0361326D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 15 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 7.6298395D 04 | | |
| X | 5.5903434D 07 | Y | 1.4443815D 08 | Z | 9.0188674D 07 |
| DX | 1.6998758D 02 | DY | 1.5360648D 03 | DZ | 7.9228821D 02 |
| R | 1.7922492D 08 | DEC | 3.0212933D 01 | RA | 6.8841534D 01 |
| V | 1.7366956D 03 | PTH | 7.6631258D 01 | AZ | 9.9615329D 01 |
| ALT | 1.7285216D 08 | LTGD | 3.0218874D 01 | LON | 1.3540855D 01 |
| VE | 1.1028465D 04 | PTE | 8.8127693D 00 | AZE | -9.0353541D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 15 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 7.8098395D 04 | | |
| X | 5.6203323D 07 | Y | 1.4718707D 08 | Z | 9.1604802D 07 |
| DX | 1.6327384D 02 | DY | 1.5183852D 03 | DZ | 7.8125104D 02 |
| R | 1.8224787D 08 | DEC | 3.0174716D 01 | RA | 6.9100660D 01 |
| V | 1.7153732D 03 | PTH | 7.6693099D 01 | AZ | 9.9751600D 01 |
| ALT | 1.7587511D 08 | LTGD | 3.0180553D 01 | LON | 6.2794482D 00 |
| VE | 1.1224828D 04 | PTE | 8.5525187D 00 | AZE | -9.0346063D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 1 APRIL 1968 16 HRS., 1 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 7.9898395D 04
 X 5.6491398D 07 Y 1.4990466D 08 Z 9.3001400D 07
 DX 1.5685800D 02 DY 1.5012461D 03 DZ 7.7058482D 02
 R 1.8523484D 08 DEC 3.0137238D 01 RA 6.9351136D 01
 V 1.6947404D 03 PTH 7.6751843D 01 AZ 9.9883658D 01
 ALT 1.7886206D 08 LTGD 3.0142977D 01 LON 3.5900935D 02
 VE 1.1419024D 04 PTE 8.3062068D 00 AZE-9.0338878D 01

TIME 1 APRIL 1968 16 HRS., 31 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 8.1698395D 04
 X 5.6768179D 07 Y 1.5259186D 08 Z 9.4379117D 07
 DX 1.5072024D 02 DY 1.4846173D 03 DZ 7.6026747D 02
 R 1.8818693D 08 DEC 3.0100474D 01 RA 6.9593474D 01
 V 1.6747572D 03 PTH 7.6807685D 01 AZ 1.0001178D 02
 ALT 1.8181414D 08 LTGD 3.0106119D 01 LON 3.5173116D 02
 VE 1.1611109D 04 PTE 8.0727539D 00 AZE-9.0331972D 01

TIME 1 APRIL 1968 17 HRS., 1 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 8.3498395D 04
 X 5.7034147D 07 Y 1.5524957D 08 Z 9.5738560D 07
 DX 1.4484254D 02 DY 1.4684710D 03 DZ 7.5027877D 02
 R 1.9110520D 08 DEC 3.0064398D 01 RA 6.9828142D 01
 V 1.6553866D 03 PTH 7.6860804D 01 AZ 1.0013622D 02
 ALT 1.8473239D 08 LTGD 3.0069953D 01 LON 3.4444529D 02
 VE 1.1801138D 04 PTE 7.8511881D 00 AZE-9.0325332D 01

TIME 1 APRIL 1968 17 HRS., 31 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 8.5298395D 04
 X 5.7289758D 07 Y 1.5787863D 08 Z 9.7080306D 07
 DX 1.3920847D 02 DY 1.4527817D 03 DZ 7.4060012D 02
 R 1.9399063D 08 DEC 3.0028988D 01 RA 7.0055572D 01
 V 1.6365947D 03 PTH 7.6911365D 01 AZ 1.0025722D 02
 ALT 1.8761782D 08 LTGD 3.0034456D 01 LON 3.3715219D 02
 VE 1.1989166D 04 PTE 7.6406326D 00 AZE-9.0318945D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 18 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 8.7098395D 04 |
| X | 5.7535435D 07 | Y | 1.6047985D 08 | Z | 9.8404897D 07 |
| DX | 1.3380305D 02 | DY | 1.4375255D 03 | DZ | 7.8121440D 02 |
| R | 1.9684418D 08 | DEC | 2.9994220D 01 | RA | 7.0276161D 01 |
| V | 1.6183502D 03 | PTH | 7.6959518D 01 | AZ | 1.0037498D 02 |
| ALT | 1.9047135D 08 | LTGD | 2.9999605D 01 | LON | 3.2985225D 02 |
| VE | 1.2175241D 04 | PTE | 7.4402940D 00 | AZE | -9.0312800D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 18 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 8.8898395D 04 |
| X | 5.7771578D 07 | Y | 1.6305397D 08 | Z | 9.9712844D 07 |
| DX | 1.2861253D 02 | DY | 1.4226804D 03 | DZ | 7.2210581D 02 |
| R | 1.9966673D 08 | DEC | 2.9960071D 01 | RA | 7.0490274D 01 |
| V | 1.6006241D 03 | PTH | 7.7005404D 01 | AZ | 1.0048973D 02 |
| ALT | 1.9329390D 08 | LTGD | 2.9965377D 01 | LON | 3.2254583D 02 |
| VE | 1.2359413D 04 | PTE | 7.2494528D 00 | AZE | -9.0306884D 01 |

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|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 19 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 9.0698395D 04 |
| X | 5.7998561D 07 | Y | 1.6560173D 08 | Z | 1.0100464D 08 |
| DX | 1.2362433D 02 | DY | 1.4082262D 03 | DZ | 7.1325975D 02 |
| R | 2.0245914D 08 | DEC | 2.9926522D 01 | RA | 7.0698252D 01 |
| V | 1.5833899D 03 | PTH | 7.7049153D 01 | AZ | 1.0060163D 02 |
| ALT | 1.9608629D 08 | LTGD | 2.9931750D 01 | LON | 3.1523327D 02 |
| VE | 1.2541728D 04 | PTE | 7.0674554D 00 | AZE | -9.0301187D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 1 APRIL 1968 | 19 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 9.2498395D 04 |
| X | 5.8216740D 07 | Y | 1.6812381D 08 | Z | 1.0228073D 08 |
| DX | 1.1882688D 02 | DY | 1.3941439D 03 | DZ | 7.0466270D 02 |
| R | 2.0522220D 08 | DEC | 2.9893550D 01 | RA | 7.0900407D 01 |
| V | 1.5666226D 03 | PTH | 7.7090885D 01 | AZ | 1.0071087D 02 |
| ALT | 1.9884934D 08 | LTGD | 2.9898705D 01 | LON | 3.0791489D 02 |
| VE | 1.2722233D 04 | PTE | 6.8937061D 00 | AZE | -9.0295698D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | | | | | | |
|----------------------|------------|-------|------|---------------------------|------------|----|-------|-------|-------------|-----|
| TIME | 1 | APRIL | 1968 | 20 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 9.4298395D 04 | | | | | | |
| X | 5.8426446D | 07 | | Y | 1.7062086D | 08 | | Z | 1.0354156D | 08 |
| DX | 1.1420953D | 02 | | DY | 1.3804158D | 03 | | DZ | 6.9630211D | 02 |
| R | 2.0795669D | 09 | | DEC | 2.9861138D | 01 | | RA | 7.1097030D | 01 |
| V | 1.5502994D | 03 | | PTH | 7.7130713D | 01 | | AZ | 1.0081762D | 02 |
| ALT | 2.0158382D | 08 | | LTGD | 2.9866221D | 01 | | LON | 3.0059098D | 02 |
| VE | 1.2900968D | 04 | | PTE | 6.7276616D | 00 | | AZE | -9.0290408D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|---------------------------|------------|----|-------|-------|-------------|-----|
| TIME | 1 | APRIL | 1968 | 20 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 9.6098395D 04 | | | | | | |
| X | 5.8627996D | 07 | | Y | 1.7309351D | 08 | | Z | 1.0478755D | 08 |
| DX | 1.0976246D | 02 | | DY | 1.3670255D | 03 | | DZ | 6.8816633D | 02 |
| R | 2.1066332D | 08 | | DEC | 2.9829265D | 01 | | RA | 7.1288392D | 01 |
| V | 1.5343987D | 03 | | PTH | 7.7168741D | 01 | | AZ | 1.0092201D | 02 |
| ALT | 2.0429044D | 08 | | LTGD | 2.9834281D | 01 | | LON | 2.9326181D | 02 |
| VE | 1.3077977D | 04 | | PTE | 6.5688248D | 00 | | AZE | -9.0285307D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|---------------------------|------------|----|-------|-------|-------------|-----|
| TIME | 1 | APRIL | 1968 | 21 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 9.7898395D 04 | | | | | | |
| X | 5.8821688D | 07 | | Y | 1.7554235D | 08 | | Z | 1.0601909D | 08 |
| DX | 1.0547661D | 02 | | DY | 1.3539576D | 03 | | DZ | 6.8024451D | 02 |
| R | 2.1334281D | 08 | | DEC | 2.9797915D | 01 | | RA | 7.1474744D | 01 |
| V | 1.5189006D | 03 | | PTH | 7.7205066D | 01 | | AZ | 1.0102420D | 02 |
| ALT | 2.0696992D | 08 | | LTGD | 2.9802864D | 01 | | LON | 2.8592763D | 02 |
| VE | 1.3253298D | 04 | | PTE | 6.4167403D | 00 | | AZE | -9.0280386D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|---------------------------|------------|----|-------|-------|-------------|-----|
| TIME | 1 | APRIL | 1968 | 21 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME 9.9698395D 04 | | | | | | |
| X | 5.9007804D | 07 | | Y | 1.7796794D | 08 | | Z | 1.0723655D | 08 |
| DX | 1.0134359D | 02 | | DY | 1.3411978D | 03 | | DZ | 6.7252655D | 02 |
| R | 2.1599580D | 08 | | DEC | 2.9767070D | 01 | | RA | 7.1656321D | 01 |
| V | 1.5037866D | 03 | | PTH | 7.7239781D | 01 | | AZ | 1.0112432D | 02 |
| ALT | 2.0962290D | 08 | | LTGD | 2.9771955D | 01 | | LON | 2.7858868D | 02 |
| VE | 1.3426971D | 04 | | PTE | 6.2709902D | 00 | | AZE | -9.0275636D | 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 1 APRIL 1968 22 HRS., 1 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0149839D 05
 X 5.9186612D 07 Y 1.8037084D 08 Z 1.0844030D 08
 DX 9.7355630D 01 DY 1.3287328D 03 DZ 6.6500300D 02
 R 2.1862295D 08 DEC 2.9736714D 01 RA 7.1833342D 01
 V 1.4890393D 03 PTH 7.7272971D 01 AZ 1.0122250D 02
 ALT 2.1225004D 08 LTGD 2.9741537D 01 LON 2.7124516D 02
 VE 1.3599031D 04 PTE 6.1311901D 00 AZE-9.0271051D 01

TIME 1 APRIL 1968 22 HRS., 31 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0329839D 05
 X 5.9358367D 07 Y 1.8275155D 08 Z 1.0963068D 08
 DX 9.3505528D 01 DY 1.3165498D 03 DZ 6.5766506D 02
 R 2.2122484D 08 DEC 2.9706830D 01 RA 7.2006011D 01
 V 1.4746423D 03 PTH 7.7304717D 01 AZ 1.0131885D 02
 ALT 2.1485192D 08 LTGD 2.9711594D 01 LON 2.6389730D 02
 VE 1.3769515D 04 PTE 5.9969860D 00 AZE-9.0266621D 01

TIME 1 APRIL 1968 23 HRS., 1 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0509839D 05
 X 5.9523310D 07 Y 1.8511058D 08 Z 1.1080800D 08
 DX 8.9786591D 01 DY 1.3046371D 03 DZ 6.5050448D 02
 R 2.2380206D 08 DEC 2.9677404D 01 RA 7.2174520D 01
 V 1.4605806D 03 PTH 7.7335095D 01 AZ 1.0141349D 02
 ALT 2.1742914D 08 LTGD 2.9682110D 01 LON 2.5654527D 02
 VE 1.3938456D 04 PTE 5.8680514D 00 AZE-9.0262341D 01

TIME 1 APRIL 1968 23 HRS., 31 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0689839D 05
 X 5.9681673D 07 Y 1.8744840D 08 Z 1.1197259D 08
 DX 8.6192599D 01 DY 1.2929837D 03 DZ 6.4351352D 02
 R 2.2635518D 08 DEC 2.9648421D 01 RA 7.2339047D 01
 V 1.4468399D 03 PTH 7.7364177D 01 AZ 1.0150653D 02
 ALT 2.1998224D 08 LTGD 2.9653071D 01 LON 2.4918927D 02
 VE 1.4105887D 04 PTE 5.7440845D 00 AZE-9.0258204D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 2 APRIL 1968 0 HRS., 1 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.0869839D 05
 X 5.9833675D 07 Y 1.8976547D 08 Z 1.1312475D 08
 DX 8.2717758D 01 DY 1.2815790D 03 DZ 6.3668494D 02
 R 2.2888471D 08 DEC 2.9619868D 01 RA 7.2499762D 01
 V 1.4334066D 03 PTH 7.7392031D 01 AZ 1.0159807D 02
 ALT 2.2251176D 08 LTGD 2.9624464D 01 LON 2.4182945D 02
 VE 1.4271841D 04 PTE 5.6248061D 00 AZE-9.0254203D 01

TIME 2 APRIL 1968 0 HRS., 31 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.1049839D 05
 X 5.9979526D 07 Y 1.9206223D 08 Z 1.1426475D 08
 DX 7.9356669D 01 DY 1.2704132D 03 DZ 6.3001192D 02
 R 2.3139117D 08 DEC 2.9591730D 01 RA 7.2656821D 01
 V 1.4202684D 03 PTH 7.7418720D 01 AZ 1.0168821D 02
 ALT 2.2501822D 08 LTGD 2.9596273D 01 LON 2.3446598D 02
 VE 1.4436347D 04 PTE 5.5099575D 00 AZE-9.0250332D 01

TIME 2 APRIL 1968 1 HRS., 1 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.1229839D 05
 X 6.0119424D 07 Y 1.9433909D 08 Z 1.1539288D 08
 DX 7.6104298D 01 DY 1.2594772D 03 DZ 6.2348806D 02
 R 2.3387506D 08 DEC 2.9563995D 01 RA 7.2810375D 01
 V 1.4074132D 03 PTH 7.7444308D 01 AZ 1.0177704D 02
 ALT 2.2750210D 08 LTGD 2.9568488D 01 LON 2.2709900D 02
 VE 1.4599434D 04 PTE 5.3992987D 00 AZE-9.0246586D 01

TIME 2 APRIL 1968 1 HRS., 31 MIN., 4.935 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.1409839D 05
 X 6.0253563D 07 Y 1.9659648D 08 Z 1.1650940D 08
 DX 7.2955942D 01 DY 1.2487621D 03 DZ 6.1710734D 02
 R 2.3633685D 08 DEC 2.9536651D 01 RA 7.2960561D 01
 V 1.3948300D 03 PTH 7.7468851D 01 AZ 1.0186465D 02
 ALT 2.2996387D 08 LTGD 2.9541095D 01 LON 2.1972865D 02
 VE 1.4761132D 04 PTE 5.2926064D 00 AZE-9.0242959D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 2 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.1589839D 05 |
| X | 6.0382126D 07 | Y | 1.9883476D 08 | Z | 1.1761455D 08 |
| DX | 6.9907206D 01 | DY | 1.2382597D 03 | DZ | 6.1086407D 02 |
| R | 2.3877698D 08 | DEC | 2.9509686D 01 | RA | 7.3107513D 01 |
| V | 1.3825083D 03 | PTH | 7.7492406D 01 | AZ | 1.0195112D 02 |
| ALT | 2.3240400D 08 | LTGD | 2.9514082D 01 | LON | 2.1235507D 02 |
| VE | 1.4921468D 04 | PTE | 5.1896732D 00 | AZE | -9.0239446D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 2 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.1769839D 05 |
| X | 6.0505287D 07 | Y | 2.0105433D 08 | Z | 1.1870859D 08 |
| DX | 6.6953979D 01 | DY | 1.2279623D 03 | DZ | 6.0475290D 02 |
| R | 2.4119590D 08 | DEC | 2.9483089D 01 | RA | 7.3251355D 01 |
| V | 1.3704380D 03 | PTH | 7.7515026D 01 | AZ | 1.0203655D 02 |
| ALT | 2.3482291D 08 | LTGD | 2.9487438D 01 | LON | 2.0497838D 02 |
| VE | 1.5080468D 04 | PTE | 5.0903057D 00 | AZE | -9.0236043D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 3 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.1949839D 05 |
| X | 6.0623215D 07 | Y | 2.0325555D 08 | Z | 1.1979174D 08 |
| DX | 6.4092415D 01 | DY | 1.2178624D 03 | DZ | 5.9876878D 02 |
| R | 2.4359403D 08 | DEC | 2.9456848D 01 | RA | 7.3392203D 01 |
| V | 1.3586099D 03 | PTH | 7.7536762D 01 | AZ | 1.0212100D 02 |
| ALT | 2.3722103D 08 | LTGD | 2.9461152D 01 | LON | 1.9759869D 02 |
| VE | 1.5238158D 04 | PTE | 4.9943237D 00 | AZE | -9.0232745D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 3 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2129839D 05 |
| X | 6.0736072D 07 | Y | 2.0543875D 08 | Z | 1.2086423D 08 |
| DX | 6.1318909D 01 | DY | 1.2079531D 03 | DZ | 5.9290692D 02 |
| R | 2.4597177D 08 | DEC | 2.9430954D 01 | RA | 7.3530168D 01 |
| V | 1.3470150D 03 | PTH | 7.7557663D 01 | AZ | 1.0220455D 02 |
| ALT | 2.3959877D 08 | LTGD | 2.9435214D 01 | LON | 1.9021613D 02 |
| VE | 1.5394563D 04 | PTE | 4.9015587D 00 | AZE | -9.0229548D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 4 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2309839D 05 |
| X | 6.0844014D 07 | Y | 2.0760429D 08 | Z | 1.2192627D 08 |
| DX | 5.8630086D 01 | DY | 1.1982278D 03 | DZ | 5.8716282D 02 |
| R | 2.4832952D 08 | DEC | 2.9405395D 01 | RA | 7.3665356D 01 |
| V | 1.3356450D 03 | PTH | 7.7577777D 01 | AZ | 1.0228729D 02 |
| ALT | 2.4195650D 08 | LTGD | 2.9409612D 01 | LON | 1.8283078D 02 |
| VE | 1.5549707D 04 | PTE | 4.8118534D 00 | AZE | -9.0226447D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 4 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2489839D 05 |
| X | 6.0947189D 07 | Y | 2.0975248D 08 | Z | 1.2297808D 08 |
| DX | 5.6022778D 01 | DY | 1.1886802D 03 | DZ | 5.8153219D 02 |
| R | 2.5066765D 08 | DEC | 2.9380163D 01 | RA | 7.3797865D 01 |
| V | 1.3244919D 03 | PTH | 7.7597149D 01 | AZ | 1.0236928D 02 |
| ALT | 2.4429463D 08 | LTGD | 2.9384339D 01 | LON | 1.7544276D 02 |
| VE | 1.5703612D 04 | PTE | 4.7250604D 00 | AZE | -9.0223439D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 5 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2669839D 05 |
| X | 6.1045743D 07 | Y | 2.1188364D 08 | Z | 1.2401985D 08 |
| DX | 5.3494016D 01 | DY | 1.1793044D 03 | DZ | 5.7601098D 02 |
| R | 2.5298653D 08 | DEC | 2.9355248D 01 | RA | 7.3927789D 01 |
| V | 1.3135483D 03 | PTH | 7.7615824D 01 | AZ | 1.0245059D 02 |
| ALT | 2.4661350D 08 | LTGD | 2.9359383D 01 | LON | 1.6805215D 02 |
| VE | 1.5856302D 04 | PTE | 4.6410420D 00 | AZE | -9.0220520D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 5 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.2849839D 05 |
| X | 6.1139813D 07 | Y | 2.1399808D 08 | Z | 1.2505178D 08 |
| DX | 5.1041013D 01 | DY | 1.1700947D 03 | DZ | 5.7059536D 02 |
| R | 2.5528651D 08 | DEC | 2.9330641D 01 | RA | 7.4055217D 01 |
| V | 1.3028069D 03 | PTH | 7.7633844D 01 | AZ | 1.0253131D 02 |
| ALT | 2.4891347D 08 | LTGD | 2.9334736D 01 | LON | 1.6065904D 02 |
| VE | 1.6007798D 04 | PTE | 4.5596685D 00 | AZE | -9.0217687D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 2 APRIL 1968 6 HRS., 1 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.3029839D 05
X 6.1229534D 07 Y 2.1609608D 08 Z 1.2607406D 08
DX 4.8661156D 01 DY 1.1610458D 03 DZ 5.6528169D 02
R 2.5756793D 08 DEC 2.9306333D 01 RA 7.4180234D 01
V 1.2922610D 03 PTH 7.7651252D 01 AZ 1.0261148D 02
ALT 2.5119488D 08 LTGD 2.9310390D 01 LON 1.5326353D 02
VE 1.6158122D 04 PTE 4.4808188D 00 AZE-9.0214936D 01

TIME 2 APRIL 1968 6 HRS., 31 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.3209839D 05
X 6.1315036D 07 Y 2.1817793D 08 Z 1.2708686D 08
DX 4.6351989D 01 DY 1.1521526D 03 DZ 5.6006651D 02
R 2.5983112D 08 DEC 2.9282316D 01 RA 7.4302920D 01
V 1.2819042D 03 PTH 7.7668088D 01 AZ 1.0269119D 02
ALT 2.5345807D 08 LTGD 2.9286336D 01 LON 1.4586568D 02
VE 1.6307294D 04 PTE 4.4043786D 00 AZE-9.0212265D 01

TIME 2 APRIL 1968 7 HRS., 1 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.3389839D 05
X 6.1396443D 07 Y 2.2024392D 08 Z 1.2809035D 08
DX 4.4111210D 01 DY 1.1434102D 03 DZ 5.5494653D 02
R 2.6207641D 08 DEC 2.9258582D 01 RA 7.4423351D 01
V 1.2717304D 03 PTH 7.7684392D 01 AZ 1.0277049D 02
ALT 2.5570335D 08 LTGD 2.9262565D 01 LON 1.3846558D 02
VE 1.6455334D 04 PTE 4.3302408D 00 AZE-9.0209670D 01

TIME 2 APRIL 1968 7 HRS., 31 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.3569839D 05
X 6.1473876D 07 Y 2.2229430D 08 Z 1.2908472D 08
DX 4.1936658D 01 DY 1.1348140D 03 DZ 5.4991863D 02
R 2.6430410D 08 DEC 2.9235122D 01 RA 7.4541599D 01
V 1.2617337D 03 PTH 7.7700205D 01 AZ 1.0284947D 02
ALT 2.5793103D 08 LTGD 2.9239070D 01 LON 1.3106329D 02
VE 1.6602261D 04 PTE 4.2583043D 00 AZE-9.0207148D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - FIRST OPPORTUNITY (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 8 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.3749839D 05 |
| X | 6.1547453D 07 | Y | 2.2432933D 08 | Z | 1.3007012D 08 |
| DX | 3.9826305D 01 | DY | 1.1263597D 03 | DZ | 5.4497984D 02 |
| R | 2.6651449D 08 | DEC | 2.9211931D 01 | RA | 7.4657733D 01 |
| V | 1.2519087D 03 | PTH | 7.7715564D 01 | AZ | 1.0292817D 02 |
| ALT | 2.6014141D 08 | LTGD | 2.9215844D 01 | LON | 1.2365889D 02 |
| VE | 1.6748094D 04 | PTE | 4.1884742D 00 | AZE | -9.0204698D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 8 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.3929839D 05 |
| X | 6.1617288D 07 | Y | 2.2634928D 08 | Z | 1.3104670D 08 |
| DX | 3.7778250D 01 | DY | 1.1180431D 03 | DZ | 5.4012734D 02 |
| R | 2.6870787D 08 | DEC | 2.9188999D 01 | RA | 7.4771818D 01 |
| V | 1.2422501D 03 | PTH | 7.7730508D 01 | AZ | 1.0300667D 02 |
| ALT | 2.6233479D 08 | LTGD | 2.9192878D 01 | LON | 1.1625244D 02 |
| VE | 1.6892852D 04 | PTE | 4.1206606D 00 | AZE | -9.0202316D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 9 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.4109839D 05 |
| X | 6.1683491D 07 | Y | 2.2835437D 08 | Z | 1.3201462D 08 |
| DX | 3.5790714D 01 | DY | 1.1098602D 03 | DZ | 5.3535844D 02 |
| R | 2.7088454D 08 | DEC | 2.9166320D 01 | RA | 7.4883917D 01 |
| V | 1.2327528D 03 | PTH | 7.7745074D 01 | AZ | 1.0308504D 02 |
| ALT | 2.6451144D 08 | LTGD | 2.9170166D 01 | LON | 1.0884401D 02 |
| VE | 1.7036552D 04 | PTE | 4.0547792D 00 | AZE | -9.0200000D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 9 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.4289839D 05 |
| X | 6.1746170D 07 | Y | 2.3034485D 08 | Z | 1.3297404D 08 |
| DX | 3.3862027D 01 | DY | 1.1018073D 03 | DZ | 5.3067058D 02 |
| R | 2.7304475D 08 | DEC | 2.9143888D 01 | RA | 7.4994089D 01 |
| V | 1.2234121D 03 | PTH | 7.7759301D 01 | AZ | 1.0316334D 02 |
| ALT | 2.6667165D 08 | LTGD | 2.9147702D 01 | LON | 1.0143365D 02 |
| VE | 1.7179212D 04 | PTE | 3.9907499D 00 | AZE | -9.0197748D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 10 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.4469839D 05 |
| X | 6.1805429D 07 | Y | 2.3232095D 08 | Z | 1.3392509D 08 |
| DX | 3.1990632D 01 | DY | 1.0938806D 03 | DZ | 5.2606130D 02 |
| R | 2.7518878D 08 | DEC | 2.9121695D 01 | RA | 7.5102390D 01 |
| V | 1.2142235D 03 | PTH | 7.7773226D 01 | AZ | 1.0324164D 02 |
| ALT | 2.6881567D 08 | LTGD | 2.9125478D 01 | LON | 9.4021417D 01 |
| VE | 1.7320848D 04 | PTE | 3.9284974D 00 | AZE | -9.0195558D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 10 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.4649839D 05 |
| X | 6.1861370D 07 | Y | 2.3428289D 08 | Z | 1.3486790D 08 |
| DX | 3.0175072D 01 | DY | 1.0860768D 03 | DZ | 5.2152829D 02 |
| R | 2.7731689D 08 | DEC | 2.9099736D 01 | RA | 7.5208875D 01 |
| V | 1.2051826D 03 | PTH | 7.7786886D 01 | AZ | 1.0332000D 02 |
| ALT | 2.7094377D 08 | LTGD | 2.9103488D 01 | LON | 8.6607369D 01 |
| VE | 1.7461477D 04 | PTE | 3.8679503D 00 | AZE | -9.0193427D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 11 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.4829839D 05 |
| X | 6.1914092D 07 | Y | 2.3623090D 08 | Z | 1.3580263D 08 |
| DX | 2.8413989D 01 | DY | 1.0783926D 03 | DZ | 5.1706933D 02 |
| R | 2.7942932D 08 | DEC | 2.9078004D 01 | RA | 7.5313595D 01 |
| V | 1.1962853D 03 | PTH | 7.7800320D 01 | AZ | 1.0339851D 02 |
| ALT | 2.7305620D 08 | LTGD | 2.9081726D 01 | LON | 7.9191556D 01 |
| VE | 1.7601116D 04 | PTE | 3.8090410D 00 | AZE | -9.0191354D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 11 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.5009839D 05 |
| X | 6.1963692D 07 | Y | 2.3816518D 08 | Z | 1.3672940D 08 |
| DX | 2.6706122D 01 | DY | 1.0708248D 03 | DZ | 5.1268229D 02 |
| R | 2.8152634D 08 | DEC | 2.9056493D 01 | RA | 7.5416598D 01 |
| V | 1.1875278D 03 | PTH | 7.7813565D 01 | AZ | 1.0347721D 02 |
| ALT | 2.7515321D 08 | LTGD | 2.9060185D 01 | LON | 7.1774026D 01 |
| VE | 1.7739779D 04 | PTE | 3.7517058D 00 | AZE | -9.0189337D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 2 APRIL 1968 12 HRS., 1 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.5189839D 05
X 6.2010265D 07 Y 2.4008594D 08 Z 1.3764833D 08
DX 2.5050298D 01 DY 1.0633706D 03 DZ 5.0836515D 02
R 2.8360817D 08 DEC 2.9035198D 01 RA 7.5517932D 01
V 1.1789061D 03 PTH 7.7826659D 01 AZ 1.0355620D 02
ALT 2.7723503D 08 LTGD 2.9038861D 01 LON 6.4354827D 01
VE 1.7877483D 04 PTE 3.6958839D 00 AZE-9.0187374D 01

TIME 2 APRIL 1968 12 HRS., 31 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.5369839D 05
X 6.2053904D 07 Y 2.4199338D 08 Z 1.3855955D 08
DX 2.3445435D 01 DY 1.0560270D 03 DZ 5.0411598D 02
R 2.8567504D 08 DEC 2.9014112D 01 RA 7.5617642D 01
V 1.1704168D 03 PTH 7.7839641D 01 AZ 1.0363554D 02
ALT 2.7930191D 08 LTGD 2.9017747D 01 LON 5.6934003D 01
VE 1.8014241D 04 PTE 3.6415181D 00 AZE-9.0185463D 01

TIME 2 APRIL 1968 13 HRS., 1 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.5549839D 05
X 6.2094699D 07 Y 2.4388770D 08 Z 1.3946319D 08
DX 2.1890534D 01 DY 1.0487913D 03 DZ 4.9993294D 02
R 2.8772720D 08 DEC 2.8993230D 01 RA 7.5715769D 01
V 1.1620565D 03 PTH 7.7852550D 01 AZ 1.0371530D 02
ALT 2.8135405D 08 LTGD 2.8996838D 01 LON 4.9511597D 01
VE 1.8150070D 04 PTE 3.5885538D 00 AZE-9.0183603D 01

TIME 2 APRIL 1968 13 HRS., 31 MIN., 4.935 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.5729839D 05
X 6.2132739D 07 Y 2.4576909D 08 Z 1.4035935D 08
DX 2.0384679D 01 DY 1.0416609D 03 DZ 4.9581426D 02
R 2.8976485D 08 DEC 2.8972548D 01 RA 7.5812354D 01
V 1.1538218D 03 PTH 7.7865427D 01 AZ 1.0379558D 02
ALT 2.8339170D 08 LTGD 2.8976128D 01 LON 4.2087650D 01
VE 1.8284983D 04 PTE 3.5369394D 00 AZE-9.0181792D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | | | | | | |
|----------------------|------------|-------|------|-------------|------------|----|-------|------------|-------------|-----|
| TIME | 2 | APRIL | 1968 | 14 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | | | | 1.5909839D | 05 | |
| X | 6.2168112D | 07 | | Y | 2.4763774D | 08 | | Z | 1.4124816D | 08 |
| DX | 1.8927037D | 01 | | DY | 1.0346335D | 03 | | DZ | 4.9175828D | 02 |
| R | 2.9178822D | 08 | | DEC | 2.8952059D | 01 | | RA | 7.5907437D | 01 |
| V | 1.1457098D | 03 | | PTH | 7.7878312D | 01 | | AZ | 1.0387644D | 02 |
| ALT | 2.8541506D | 08 | | LTGD | 2.8955612D | 01 | | LON | 3.4662199D | 01 |
| VE | 1.8418993D | 04 | | PTE | 3.4866258D | 00 | | AZE | -9.0180030D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|-------------|------------|----|-------|------------|-------------|-----|
| TIME | 2 | APRIL | 1968 | 14 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | | | | 1.6089839D | 05 | |
| X | 6.2200905D | 07 | | Y | 2.4949383D | 08 | | Z | 1.4212972D | 08 |
| DX | 1.7516854D | 01 | | DY | 1.0277066D | 03 | | DZ | 4.8776337D | 02 |
| R | 2.9379752D | 08 | | DEC | 2.8931758D | 01 | | RA | 7.6001054D | 01 |
| V | 1.1377173D | 03 | | PTH | 7.7891247D | 01 | | AZ | 1.0395797D | 02 |
| ALT | 2.8742435D | 08 | | LTGD | 2.8935286D | 01 | | LON | 2.7235283D | 01 |
| VE | 1.8552116D | 04 | | PTE | 3.4375664D | 00 | | AZE | -9.0178314D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|-------------|------------|----|-------|------------|-------------|-----|
| TIME | 2 | APRIL | 1968 | 15 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | | | | 1.6269839D | 05 | |
| X | 6.2231201D | 07 | | Y | 2.5133754D | 08 | | Z | 1.4300414D | 08 |
| DX | 1.6153452D | 01 | | DY | 1.0208780D | 03 | | DZ | 4.8382800D | 02 |
| R | 2.9579294D | 08 | | DEC | 2.8911642D | 01 | | RA | 7.6093241D | 01 |
| V | 1.1298418D | 03 | | PTH | 7.7904275D | 01 | | AZ | 1.0404026D | 02 |
| ALT | 2.8941977D | 08 | | LTGD | 2.8915144D | 01 | | LON | 1.9806937D | 01 |
| VE | 1.8684365D | 04 | | PTE | 3.3897169D | 00 | | AZE | -9.0176643D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|-------------|------------|----|-------|------------|-------------|-----|
| TIME | 2 | APRIL | 1968 | 15 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | | | | 1.6449839D | 05 | |
| X | 6.2259085D | 07 | | Y | 2.5316905D | 08 | | Z | 1.4387153D | 08 |
| DX | 1.4836232D | 01 | | DY | 1.0141457D | 03 | | DZ | 4.7995072D | 02 |
| R | 2.9777471D | 08 | | DEC | 2.8891704D | 01 | | RA | 7.6184031D | 01 |
| V | 1.1220803D | 03 | | PTH | 7.7917441D | 01 | | AZ | 1.0412340D | 02 |
| ALT | 2.9140153D | 08 | | LTGD | 2.8895182D | 01 | | LON | 1.2377195D | 01 |
| VE | 1.8815752D | 04 | | PTE | 3.3430351D | 00 | | AZE | -9.0175017D | 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 16 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.6629839D 05 |
| X | 6.2284639D 07 | Y | 2.5498852D 08 | Z | 1.4473200D 08 |
| DX | 1.3564673D 01 | DY | 1.0075075D 03 | DZ | 4.7613012D 02 |
| R | 2.9974301D 08 | DEC | 2.8871941D 01 | RA | 7.6273458D 01 |
| V | 1.1144304D 03 | PTH | 7.7930790D 01 | AZ | 1.0420749D 02 |
| ALT | 2.9336983D 08 | LTGD | 2.8875394D 01 | LON | 4.9460878D 00 |
| VE | 1.8946292D 04 | PTE | 3.2974812D 00 | AZE | -9.0173433D 01 |
| | | | | | |
| TIME | 2 APRIL 1968 | 16 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.6809839D 05 |
| X | 6.2307945D 07 | Y | 2.5679613D 08 | Z | 1.4558563D 08 |
| DX | 1.2338330D 01 | DY | 1.0009616D 03 | DZ | 4.7236488D 02 |
| R | 3.0169804D 08 | DEC | 2.8852347D 01 | RA | 7.6361551D 01 |
| V | 1.1068898D 03 | PTH | 7.7944371D 01 | AZ | 1.0429262D 02 |
| ALT | 2.9532485D 08 | LTGD | 2.8855777D 01 | LON | 3.5751361D 02 |
| VE | 1.9075996D 04 | PTE | 3.2530168D 00 | AZE | -9.0171892D 01 |
| | | | | | |
| TIME | 2 APRIL 1968 | 17 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.6989839D 05 |
| X | 6.2329084D 07 | Y | 2.5859204D 08 | Z | 1.4643254D 08 |
| DX | 1.1156833D 01 | DY | 9.9450620D 02 | DZ | 4.6865370D 02 |
| R | 3.0363999D 08 | DEC | 2.8832919D 01 | RA | 7.6448340D 01 |
| V | 1.0994559D 03 | PTH | 7.7958231D 01 | AZ | 1.0437891D 02 |
| ALT | 2.9726680D 08 | LTGD | 2.8836325D 01 | LON | 3.5007987D 02 |
| VE | 1.9204877D 04 | PTE | 3.2096057D 00 | AZE | -9.0170391D 01 |
| | | | | | |
| TIME | 2 APRIL 1968 | 17 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.7169839D 05 |
| X | 6.2348136D 07 | Y | 2.6037641D 08 | Z | 1.4727282D 08 |
| DX | 1.0019892D 01 | DY | 9.8813957D 02 | DZ | 4.6499539D 02 |
| R | 3.0556905D 08 | DEC | 2.8813652D 01 | RA | 7.6533853D 01 |
| V | 1.0921268D 03 | PTH | 7.7972422D 01 | AZ | 1.0446646D 02 |
| ALT | 2.9919585D 08 | LTGD | 2.8817035D 01 | LON | 3.4264485D 02 |
| VE | 1.9332948D 04 | PTE | 3.1672134D 00 | AZE | -9.0168930D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPURTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 18 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.7349839D 05 |
| X | 6.2365182D 07 | Y | 2.6214939D 08 | Z | 1.4810656D 08 |
| DX | 8.9272966D 00 | DY | 9.8186009D 02 | DZ | 4.6138879D 02 |
| R | 3.0748540D 08 | DEC | 2.8794541D 01 | RA | 7.6618118D 01 |
| V | 1.0849003D 03 | PTH | 7.7986999D 01 | AZ | 1.0455539D 02 |
| ALT | 3.0111219D 08 | LTGD | 2.8797902D 01 | LON | 3.3520858D 02 |
| VE | 1.9460222D 04 | PTE | 3.1258071D 00 | AZE | -9.0167509D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 18 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.7529839D 05 |
| X | 6.2380301D 07 | Y | 2.6391115D 08 | Z | 1.4893385D 08 |
| DX | 7.8789150D 00 | DY | 9.7566626D 02 | DZ | 4.5783279D 02 |
| R | 3.0938922D 08 | DEC | 2.8775583D 01 | RA | 7.6701158D 01 |
| V | 1.0777744D 03 | PTH | 7.8002017D 01 | AZ | 1.0464582D 02 |
| ALT | 3.0301601D 08 | LTGD | 2.8778922D 01 | LON | 3.2777109D 02 |
| VE | 1.9586710D 04 | PTE | 3.0853553D 00 | AZE | -9.0166125D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 19 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.7709839D 05 |
| X | 6.2393573D 07 | Y | 2.6566184D 08 | Z | 1.4975478D 08 |
| DX | 6.8746986D 00 | DY | 9.6955664D 02 | DZ | 4.5432635D 02 |
| R | 3.1128069D 08 | DEC | 2.8756773D 01 | RA | 7.6782999D 01 |
| V | 1.0707473D 03 | PTH | 7.8017534D 01 | AZ | 1.0473790D 02 |
| ALT | 3.0490747D 08 | LTGD | 2.8760090D 01 | LON | 3.2033239D 02 |
| VE | 1.9712424D 04 | PTE | 3.0458282D 00 | AZE | -9.0164779D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 19 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 1.7889839D 05 |
| X | 6.2405076D 07 | Y | 2.6740161D 08 | Z | 1.5056945D 08 |
| DX | 5.9146839D 00 | DY | 9.6352990D 02 | DZ | 4.5086847D 02 |
| R | 3.1315998D 08 | DEC | 2.8738108D 01 | RA | 7.6863663D 01 |
| V | 1.0638173D 03 | PTH | 7.8033614D 01 | AZ | 1.0483175D 02 |
| ALT | 3.0678675D 08 | LTGD | 2.8741404D 01 | LON | 3.1289252D 02 |
| VE | 1.9837376D 04 | PTE | 3.0071975D 00 | AZE | -9.0163470D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | | | |
|----------------------|------------|------------|------|------------|----|-------|-------------|------------|-----|
| TIME | 2 | APRIL 1968 | 20 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | FLIGHT TIME | 1.8069839D | 05 |
| X | 6.2414892D | 07 | Y | 2.6913060D | 08 | Z | 1.5137794D | 08 | |
| DX | 4.9989952D | 00 | DY | 9.5758480D | 02 | DZ | 4.4745821D | 02 | |
| R | 3.1502727D | 08 | DEC | 2.3719583D | 01 | RA | 7.6943173D | 01 | |
| V | 1.0569827D | 03 | PTH | 7.8050320D | 01 | AZ | 1.0492754D | 02 | |
| ALT | 3.0865403D | 08 | LTGD | 2.8722858D | 01 | LON | 3.0545150D | 02 | |
| VE | 1.9961579D | 04 | PTE | 2.9694362D | 00 | AZE | -9.0162197D | 01 | |

| | | | | | | | | | |
|----------------------|------------|------------|------|------------|----|-------|-------------|------------|-----|
| TIME | 2 | APRIL 1968 | 20 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | FLIGHT TIME | 1.8249839D | 05 |
| X | 6.2423100D | 07 | Y | 2.7084896D | 08 | Z | 1.5218033D | 08 | |
| DX | 4.1278485D | 00 | DY | 9.5172019D | 02 | DZ | 4.4409468D | 02 | |
| R | 3.1688272D | 08 | DEC | 2.8701195D | 01 | RA | 7.7021549D | 01 | |
| V | 1.0502421D | 03 | PTH | 7.8067723D | 01 | AZ | 1.0502543D | 02 | |
| ALT | 3.1050948D | 08 | LTGD | 2.8704449D | 01 | LON | 2.9800934D | 02 | |
| VE | 2.0085043D | 04 | PTE | 2.9325183D | 00 | AZE | -9.0160960D | 01 | |

| | | | | | | | | | |
|----------------------|------------|------------|------|------------|----|-------|-------------|------------|-----|
| TIME | 2 | APRIL 1968 | 21 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | FLIGHT TIME | 1.8429839D | 05 |
| X | 6.2429779D | 07 | Y | 2.7255684D | 08 | Z | 1.5297671D | 08 | |
| DX | 3.3015559D | 00 | DY | 9.4593501D | 02 | DZ | 4.4077704D | 02 | |
| R | 3.1872650D | 08 | DEC | 2.8682939D | 01 | RA | 7.7098811D | 01 | |
| V | 1.0435940D | 03 | PTH | 7.8085894D | 01 | AZ | 1.0512558D | 02 | |
| ALT | 3.1235325D | 08 | LTGD | 2.8686173D | 01 | LON | 2.9056607D | 02 | |
| VE | 2.0207781D | 04 | PTE | 2.8964195D | 00 | AZE | -9.0159757D | 01 | |

| | | | | | | | | | |
|----------------------|------------|------------|------|------------|----|-------|-------------|------------|-----|
| TIME | 2 | APRIL 1968 | 21 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | FLIGHT TIME | 1.8609839D | 05 |
| X | 6.2435012D | 07 | Y | 2.7425437D | 08 | Z | 1.5376715D | 08 | |
| DX | 2.5205304D | 00 | DY | 9.4022831D | 02 | DZ | 4.3750448D | 02 | |
| R | 3.2055878D | 08 | DEC | 2.8664812D | 01 | RA | 7.7174978D | 01 | |
| V | 1.0370370D | 03 | PTH | 7.8104911D | 01 | AZ | 1.0522819D | 02 | |
| ALT | 3.1418553D | 08 | LTGD | 2.8668027D | 01 | LON | 2.8312171D | 02 | |
| VE | 2.0329804D | 04 | PTE | 2.8611163D | 00 | AZE | -9.0158589D | 01 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|---------------------------|---------------|-------------|----------------|
| TIME | 2 APRIL 1968 | 22 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 1.8789839D 05 | | | |
| X | 6.2438881D 07 | Y | 2.7594171D 08 | Z | 1.5455175D 08 |
| DX | 1.7852921D 00 | DY | 9.3459920D 02 | DZ | 4.3427628D 02 |
| R | 3.2237972D 08 | DEC | 2.8646811D 01 | RA | 7.7250066D 01 |
| V | 1.0305701D 03 | PTH | 7.8124856D 01 | AZ | 1.0533346D 02 |
| ALT | 3.1600646D 08 | LTGD | 2.8650006D 01 | LON | 2.7567626D 02 |
| VE | 2.0451124D 04 | PTE | 2.8265866D 00 | AZE | -9.0157455D 01 |
| | | | | | |
| TIME | 2 APRIL 1968 | 22 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 1.8969839D 05 | | | |
| X | 6.2441467D 07 | Y | 2.7761898D 08 | Z | 1.5533058D 08 |
| DX | 1.0964742D 00 | DY | 9.2904693D 02 | DZ | 4.3109173D 02 |
| R | 3.2418948D 08 | DEC | 2.8628931D 01 | RA | 7.7324092D 01 |
| V | 1.0241921D 03 | PTH | 7.8145817D 01 | AZ | 1.0544161D 02 |
| ALT | 3.1781622D 08 | LTGD | 2.8632106D 01 | LON | 2.6822975D 02 |
| VE | 2.0571752D 04 | PTE | 2.7928092D 00 | AZE | -9.0156355D 01 |
| | | | | | |
| TIME | 2 APRIL 1968 | 23 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 1.9149839D 05 | | | |
| X | 6.2442856D 07 | Y | 2.7928632D 08 | Z | 1.5610371D 08 |
| DX | 4.5483146D-01 | DY | 9.2357081D 02 | DZ | 4.2795018D 02 |
| R | 3.2598823D 08 | DEC | 2.8611168D 01 | RA | 7.7397071D 01 |
| V | 1.0179021D 03 | PTH | 7.8167887D 01 | AZ | 1.0555287D 02 |
| ALT | 3.1961497D 08 | LTGD | 2.8614325D 01 | LON | 2.6078220D 02 |
| VE | 2.0691700D 04 | PTE | 2.7597642D 00 | AZE | -9.0155288D 01 |
| | | | | | |
| TIME | 2 APRIL 1968 | 23 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | FLIGHT TIME 1.9329839D 05 | | | |
| X | 6.2443133D 07 | Y | 2.8094388D 08 | Z | 1.5687122D 08 |
| DX | -1.3875125D-01 | DY | 9.1817027D 02 | DZ | 4.2485103D 02 |
| R | 3.2777612D 08 | DEC | 2.8593520D 01 | RA | 7.7469019D 01 |
| V | 1.0116991D 03 | PTH | 7.8191166D 01 | AZ | 1.0566751D 02 |
| ALT | 3.2140285D 08 | LTGD | 2.8596659D 01 | LON | 2.5333362D 02 |
| VE | 2.0810979D 04 | PTE | 2.7274325D 00 | AZE | -9.0154255D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968
GEOCENTRIC REFERENCE
X 6.2442386D 07
DX-6.8324895D-01
R 3.2955332D 08
V 1.0055825D 03
ALT 3.2318004D 08
VE 2.0929602D 04

0 HRS., 1 MIN., 4.935 SEC., GMT
FLIGHT TIME 1.9509839D 05
Y 2.8259178D 08 Z 1.5763320D 08
DY 9.1284484D 02 DZ 4.2179374D 02
DEC 2.8575982D 01 RA 7.7539948D 01
PTH 7.8215762D 01 AZ 1.0578580D 02
LTGD 2.8579103D 01 LON 2.4588401D 02
PTE 2.6957962D 00 AZE-9.0153254D 01

TIME 3 APRIL 1968
GEOCENTRIC REFERENCE
X 6.2440704D 07
DX-1.1774848D 00
R 3.3131998D 08
V 9.9955160D 02
ALT 3.2494669D 08
VE 2.1047580D 04

0 HRS., 31 MIN., 4.935 SEC., GMT
FLIGHT TIME 1.9689839D 05
Y 2.8423016D 08 Z 1.5838970D 08
DY 9.0759416D 02 DZ 4.1877781D 02
DEC 2.8558551D 01 RA 7.7609870D 01
PTH 7.8241789D 01 AZ 1.0590806D 02
LTGD 2.8561654D 01 LON 2.8843340D 02
PTE 2.6648381D 00 AZE-9.0152286D 01

TIME 3 APRIL 1968
GEOCENTRIC REFERENCE
X 6.2438178D 07
DX-1.6201169D 00
R 3.3307625D 08
V 9.9360597D 02
ALT 3.2670296D 08
VE 2.1164925D 04

1 HRS., 1 MIN., 4.985 SEC., GMT
FLIGHT TIME 1.9869839D 05
Y 2.8585916D 08 Z 1.5914082D 08
DY 9.0241800D 02 DZ 4.1580279D 02
DEC 2.8541223D 01 RA 7.7678797D 01
PTH 7.8269371D 01 AZ 1.0603461D 02
LTGD 2.8544308D 01 LON 2.3098179D 02
PTE 2.6345422D 00 AZE-9.0151351D 01

TIME 3 APRIL 1968
GEOCENTRIC REFERENCE
X 6.2434903D 07
DX-2.0096233D 00
R 3.3482230D 08
V 9.8774524D 02
ALT 3.2844901D 08
VE 2.1281650D 04

1 HRS., 31 MIN., 4.935 SEC., GMT
FLIGHT TIME 2.0049839D 05
Y 2.8747891D 08 Z 1.5988662D 08
DY 8.9731621D 02 DZ 4.1286829D 02
DEC 2.8523995D 01 RA 7.7746739D 01
PTH 7.8298642D 01 AZ 1.0616584D 02
LTGD 2.8527063D 01 LON 2.2352920D 02
PTE 2.6048933D 00 AZE-9.0150449D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | | | | | | |
|----------------------|------------|-------|------|------|------------|----|-------|-------------|------------|-----|
| TIME | 3 | APRIL | 1968 | 2 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.0229839D | 05 |
| X | 6.2430976D | 07 | | Y | 2.8908955D | 08 | | Z | 1.6062717D | 08 |
| DX- | 2.3442843D | 00 | | DY | 8.9228882D | 02 | | DZ | 4.0997397D | 02 |
| R | 3.3655829D | 08 | | DEC | 2.8506863D | 01 | | RA | 7.7813704D | 01 |
| V | 9.8196919D | 02 | | PTH | 7.8329746D | 01 | | AZ | 1.0630214D | 02 |
| ALT | 3.3018499D | 08 | | LTGD | 2.8509914D | 01 | | LON | 2.1607564D | 02 |
| VE | 2.1397766D | 04 | | PTE | 2.5758773D | 00 | | AZE- | 9.0149580D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|------|------------|----|-------|-------------|------------|-----|
| TIME | 3 | APRIL | 1968 | 2 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.0409839D | 05 |
| X | 6.2426498D | 07 | | Y | 2.9069120D | 08 | | Z | 1.6136255D | 08 |
| DX- | 2.6221629D | 00 | | DY | 8.8733596D | 02 | | DZ | 4.0711954D | 02 |
| R | 3.3828437D | 08 | | DEC | 2.8489823D | 01 | | RA | 7.7879701D | 01 |
| V | 9.7627778D | 02 | | PTH | 7.8362839D | 01 | | AZ | 1.0644397D | 02 |
| ALT | 3.3191106D | 08 | | LTGD | 2.8492857D | 01 | | LUN | 2.0862110D | 02 |
| VE | 2.1513286D | 04 | | PTE | 2.5474808D | 00 | | AZE- | 9.0148744D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|------|------------|----|-------|-------------|------------|-----|
| TIME | 3 | APRIL | 1968 | 3 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.0589839D | 05 |
| X | 6.2421572D | 07 | | Y | 2.9228400D | 08 | | Z | 1.6209282D | 08 |
| DX- | 2.8410819D | 00 | | DY | 8.8245791D | 02 | | DZ | 4.0430479D | 02 |
| R | 3.4000070D | 08 | | DEC | 2.8472871D | 01 | | RA | 7.7944737D | 01 |
| V | 9.7067111D | 02 | | PTH | 7.8398091D | 01 | | AZ | 1.0659183D | 02 |
| ALT | 3.3362739D | 08 | | LTGD | 2.8475889D | 01 | | LON | 2.0116560D | 02 |
| VE | 2.1628223D | 04 | | PTE | 2.5196915D | 00 | | AZE- | 9.0147941D | 01 |

| | | | | | | | | | | |
|----------------------|------------|-------|------|------|------------|----|-------|-------------|------------|-----|
| TIME | 3 | APRIL | 1968 | 3 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.0769839D | 05 |
| X | 6.2416307D | 07 | | Y | 2.9386809D | 08 | | Z | 1.6281807D | 08 |
| DX- | 2.9985972D | 00 | | DY | 8.7765513D | 02 | | DZ | 4.0152955D | 02 |
| R | 3.4170744D | 08 | | DEC | 2.8456004D | 01 | | RA | 7.8008817D | 01 |
| V | 9.6514947D | 02 | | PTH | 7.8435686D | 01 | | AZ | 1.0674627D | 02 |
| ALT | 3.3533412D | 08 | | LTGD | 2.8459006D | 01 | | LON | 1.9370915D | 02 |
| VE | 2.1742590D | 04 | | PTE | 2.4924979D | 00 | | AZE- | 9.0147173D | 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 3 APRIL 1968 | 4 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.0949839D 05 |
| X | 6.2410816D 07 | Y | 2.9544361D 08 | Z | 1.6353835D 08 |
| DX- | 3.0919682D 00 | DY | 8.7292823D 02 | DZ | 3.9879375D 02 |
| R | 3.4340476D 08 | DEC | 2.8439218D 01 | RA | 7.8071945D 01 |
| V | 9.5971335D 02 | PTH | 7.8475825D 01 | AZ | 1.0690791D 02 |
| ALT | 3.3703144D 08 | LTGD | 2.8442204D 01 | LON | 1.8625174D 02 |
| VE | 2.1856401D 04 | PTE | 2.4658896D 00 | AZE- | 9.0146439D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 3 APRIL 1968 | 4 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.1129839D 05 |
| X | 6.2405216D 07 | Y | 2.9701068D 08 | Z | 1.6425375D 08 |
| DX- | 3.1181220D 00 | DY | 8.6827801D 02 | DZ | 3.9609735D 02 |
| R | 3.4509281D 08 | DEC | 2.8422510D 01 | RA | 7.8134125D 01 |
| V | 9.5436342D 02 | PTH | 7.8518729D 01 | AZ | 1.0707744D 02 |
| ALT | 3.3871949D 08 | LTGD | 2.8425479D 01 | LON | 1.7879339D 02 |
| VE | 2.1969669D 04 | PTE | 2.4398570D 00 | AZE- | 9.0145740D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 3 APRIL 1968 | 5 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.1309839D 05 |
| X | 6.2399633D 07 | Y | 2.9856945D 08 | Z | 1.6496433D 08 |
| DX- | 3.0736130D 00 | DY | 8.6370549D 02 | DZ | 3.9344041D 02 |
| R | 3.4677177D 08 | DEC | 2.8405874D 01 | RA | 7.8195358D 01 |
| V | 9.4910061D 02 | PTH | 7.8564636D 01 | AZ | 1.0725565D 02 |
| ALT | 3.4039844D 08 | LTGD | 2.8408828D 01 | LON | 1.7133409D 02 |
| VE | 2.2082409D 04 | PTE | 2.4143915D 00 | AZE- | 9.0145076D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------|---------------|
| TIME | 3 APRIL 1968 | 5 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.1489839D 05 |
| X | 6.2394196D 07 | Y | 3.0012007D 08 | Z | 1.6567016D 08 |
| DX- | 2.9545754D 00 | DY | 8.5921188D 02 | DZ | 3.9082309D 02 |
| R | 3.4844181D 08 | DEC | 2.8389307D 01 | RA | 7.8255644D 01 |
| V | 9.4392610D 02 | PTH | 7.8613810D 01 | AZ | 1.0744339D 02 |
| ALT | 3.4206847D 08 | LTGD | 2.8392245D 01 | LON | 1.6387384D 02 |
| VE | 2.2194637D 04 | PTE | 2.3894857D 00 | AZE- | 9.0144450D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|-------------------|---------------|
| TIME | 3 APRIL 1968 | 6 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.1669839D 05 |
| X | 6.2389044D 07 | Y | 3.0166266D 08 | Z | 1.6637132D 08 |
| DX-2.7566682D 00 | | DY | 8.5479869D 02 | DZ | 3.8824561D 02 |
| R | 3.5010309D 08 | DEC | 2.8372804D 01 | RA | 7.8314984D 01 |
| V | 9.3884134D 02 | PTH | 7.8666543D 01 | AZ | 1.0764168D 02 |
| ALT | 3.4372974D 08 | LTGD | 2.8375728D 01 | LON | 1.5641265D 02 |
| VE | 2.2306368D 04 | PTE | 2.3651331D 00 | AZE-9.0143861D 01 | |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------------|---------------|
| TIME | 3 APRIL 1968 | 6 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.1849839D 05 |
| X | 6.2384322D 07 | Y | 3.0319739D 08 | Z | 1.6706787D 08 |
| DX-2.4750098D 00 | | DY | 8.5046767D 02 | DZ | 3.8570831D 02 |
| R | 3.5175579D 08 | DEC | 2.8356363D 01 | RA | 7.8373372D 01 |
| V | 9.3384811D 02 | PTH | 7.8723153D 01 | AZ | 1.0785162D 02 |
| ALT | 3.4538244D 08 | LTGD | 2.8359271D 01 | LON | 1.4895051D 02 |
| VE | 2.2417618D 04 | PTE | 2.3413284D 00 | AZE-9.0143312D 01 | |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------------|---------------|
| TIME | 3 APRIL 1968 | 7 HRS., | 1 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.2029839D 05 |
| X | 6.2380187D 07 | Y | 3.0472440D 08 | Z | 1.6775989D 08 |
| DX-2.1041018D 00 | | DY | 8.4622090D 02 | DZ | 3.8321164D 02 |
| R | 3.5340010D 08 | DEC | 2.8339977D 01 | RA | 7.8430806D 01 |
| V | 9.2894854D 02 | PTH | 7.8783995D 01 | AZ | 1.0807451D 02 |
| ALT | 3.4702674D 08 | LTGD | 2.8342871D 01 | LON | 1.4148741D 02 |
| VE | 2.2528405D 04 | PTE | 2.3180675D 00 | AZE-9.0142803D 01 | |

| | | | | | |
|----------------------|---------------|---------|---------------|-------------------|---------------|
| TIME | 3 APRIL 1968 | 7 HRS., | 31 MIN., | 4.935 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 2.2209839D 05 |
| X | 6.2376805D 07 | Y | 3.0624384D 08 | Z | 1.6844745D 08 |
| DX-1.6377392D 00 | | DY | 8.4206079D 02 | DZ | 3.8075617D 02 |
| R | 3.5503619D 08 | DEC | 2.8323642D 01 | RA | 7.8487278D 01 |
| V | 9.2414518D 02 | PTH | 7.8849461D 01 | AZ | 1.0831182D 02 |
| ALT | 3.4866284D 08 | LTGD | 2.8326521D 01 | LON | 1.3402335D 02 |
| VE | 2.2638748D 04 | PTE | 2.2953476D 00 | AZE-9.0142336D 01 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|------------|----|-------|-------------|-------------|-----|
| TIME | 3 | APRIL | 1968 | 8 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.2389839D | 05 |
| X | 6.2374353D | 07 | | Y | 3.0775587D | 08 | | Z | 1.6913064D | 08 |
| DX | -1.0689024D | 00 | | DY | 8.3799019D | 02 | | DZ | 3.7834259D | 02 |
| R | 3.5666428D | 08 | | DEC | 2.8307353D | 01 | | RA | 7.8542780D | 01 |
| V | 9.1944103D | 02 | | PTH | 7.8919986D | 01 | | AZ | 1.0856525D | 02 |
| ALT | 3.5029092D | 08 | | LTGD | 2.8310218D | 01 | | LON | 1.2655831D | 02 |
| VE | 2.2748666D | 04 | | PTE | 2.2731673D | 00 | | AZE | -9.0141914D | 01 |
| | | | | | | | | | | |
| TIME | 3 | APRIL | 1968 | 8 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.2569839D | 05 |
| X | 6.2373023D | 07 | | Y | 3.0926066D | 08 | | Z | 1.6980951D | 08 |
| DX | -3.8962972D | -01 | | DY | 8.3401236D | 02 | | DZ | 3.7597178D | 02 |
| R | 3.5828455D | 08 | | DEC | 2.8291105D | 01 | | RA | 7.8597301D | 01 |
| V | 9.1483963D | 02 | | PTH | 7.8996057D | 01 | | AZ | 1.0883675D | 02 |
| ALT | 3.5191118D | 08 | | LTGD | 2.8293957D | 01 | | LON | 1.1909230D | 02 |
| VE | 2.2858180D | 04 | | PTE | 2.2515268D | 00 | | AZE | -9.0141539D | 01 |
| | | | | | | | | | | |
| TIME | 3 | APRIL | 1968 | 9 | HRS., | 1 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.2749839D | 05 |
| X | 6.2373022D | 07 | | Y | 3.1075837D | 08 | | Z | 1.7048416D | 08 |
| DX | 4.0913625D | -01 | | DY | 8.3013109D | 02 | | DZ | 3.7364477D | 02 |
| R | 3.5989722D | 08 | | DEC | 2.8274893D | 01 | | RA | 7.8650828D | 01 |
| V | 9.1034511D | 02 | | PTH | 7.9078217D | 01 | | AZ | 1.0912862D | 02 |
| ALT | 3.5352385D | 08 | | LTGD | 2.8277730D | 01 | | LON | 1.1162530D | 02 |
| VE | 2.2967314D | 04 | | PTE | 2.2304280D | 00 | | AZE | -9.0141213D | 01 |
| | | | | | | | | | | |
| TIME | 3 | APRIL | 1968 | 9 | HRS., | 31 | MIN., | 4.935 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 2.2929839D | 05 |
| X | 6.2374574D | 07 | | Y | 3.1224919D | 08 | | Z | 1.7115466D | 08 |
| DX | 1.3377342D | 00 | | DY | 8.2635078D | 02 | | DZ | 3.7136281D | 02 |
| R | 3.6150251D | 08 | | DEC | 2.8258710D | 01 | | RA | 7.8703343D | 01 |
| V | 9.0596233D | 02 | | PTH | 7.9167076D | 01 | | AZ | 1.0944354D | 02 |
| ALT | 3.5512913D | 08 | | LTGD | 2.8261534D | 01 | | LON | 1.0415728D | 02 |
| VE | 2.3076092D | 04 | | PTE | 2.2098747D | 00 | | AZE | -9.0140939D | 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 10 HRS., 1 MIN., 4.935 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 2.3109839D 05
X 6.2377922D 07 Y 3.1373330D 08 Z 1.7182110D 08
DX 2.4080092D 00 DY 8.2267651D 02 DZ 3.6912734D 02
R 3.6310064D 08 DEC 2.8242550D 01 RA 7.8754829D 01
V 9.0169698D 02 PTH 7.9263320D 01 AZ 1.0978466D 02
ALT 3.5672726D 08 LTGD 2.8245361D 01 LON 9.6688231D 01
VE 2.3184540D 04 PTE 2.1898729D 00 AZE-9.0140722D 01

TIME 3 APRIL 1968 10 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-5.0672543D 07 YSC-2.7841767D 07 ZSC-9.6454037D 06
DXSC 9.3781462D 02 DYSC 6.0959864D 02 DZSC 2.2194009D 02
RSC 5.8616588D 07 DESC-9.4711374D 00 RASC-1.5121363D 02
VSC 1.1403351D 03 PTSC-8.5477722D 01 AZSC-6.6839244D 01
SELENOGRAPHIC REFERENCE
XSG 3.9917980D 07 YSG-4.2880913D 07 ZSG 1.9200262D 06
DXSG-9.5406673D 02 DYSG 6.6443984D 02 DZSG-3.0339005D 01
HSG 5.6878498D 07 LTSG 1.8770979D 00 LNSG-4.7049435D 01
VRSG 1.1630323D 03 PTSG-7.7804363D 01 AZSG-8.8390484D 01
LTS-1.5985849D-01 LNS 1.1639708D 02 LTE-5.6151550D 00
LNE-3.5656768D 00 DSMP 4.5812671D-01 RSMP 1.1978728D 02
LIN 1.7533272D 02 LAN-2.3381422D 01 LAP 1.5021118D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.3289839D 05
X 6.2383336D 07 Y 3.1521089D 08 Z 1.7248355D 08
DX 3.6335879D 00 DY 8.1911415D 02 DZ 3.6694012D 02
R 3.6469187D 08 DEC 2.8226408D 01 RA 7.8805261D 01
V 8.9755571D 02 PTH 7.9367724D 01 AZ 1.1015575D 02
ALT 3.5831849D 08 LTGD 2.8229205D 01 LON 8.9218130D 01
VE 2.3292688D 04 PTE 2.1704311D 00 AZE-9.0140565D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 10 HRS., 46 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

XSC-4.9827938D 07 YSC-2.7293061D 07 ZSC-9.4456905D 06
DXSC 9.3909153D 02 DYSC 6.0975177D 02 DZSC 2.2186928D 02
RSC 5.7593017D 07 DESC-9.4395862D 00 RASC-1.5128844D 02
VSC 1.1414535D 03 PTSC-8.5429427D 01 AZSC-6.6862306D 01

SELENOGRAPHIC REFERENCE

XSG 3.9060692D 07 YSG-4.2280448D 07 ZSG 1.8925363D 06
DXSG-9.5101204D 02 DYSG 6.6995095D 02 DZSG-3.0477719D 01
HSG 5.5854928D 07 LTSG 1.8831078D 00 LNSG-4.7266774D 01
VRSG 1.1636954D 03 PTSG-7.7895703D 01 AZSG-8.8376007D 01
LTS-1.5965894D-01 LNS 1.1626993D 02 LTE-5.6235935D 00
LNE-3.5792218D 00 DSMP 4.5718912D-01 RSMP 1.1967394D 02
LIN 1.7536501D 02 LAN-2.3341759D 01 LAP 1.5059186D 02

GEOCENTRIC REFERENCE

X 6.2386907D 07 Y 3.1594731D 08 Z 1.7281331D 08
DX 4.3094622D 00 DY 8.1737703D 02 DZ 3.6586521D 02
R 3.6548498D 08 DEC 2.8218340D 01 RA 7.8830074D 01
V 8.9553399D 02 PTH 7.9423257D 01 AZ 1.1035391D 02
ALT 3.5911159D 08 LTGD 2.8221131D 01 LON 8.5482677D 01
VE 2.3346660D 04 PTE 2.1609237D 00 AZE-9.0140511D 01

TIME 3 APRIL 1968 11 HRS., 1 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

XSC-4.8982166D 07 YSC-2.6744204D 07 ZSC-9.2460349D 06
DXSC 9.4040887D 02 DYSC 6.0993679D 02 DZSC 2.2181216D 02
RSC 5.6568491D 07 DESC-9.4071159D 00 RASC-1.5136550D 02
VSC 1.1426252D 03 PTSC-8.5378367D 01 AZSC-6.6883952D 01

SELENOGRAPHIC REFERENCE

XSG 3.8206145D 07 YSG-4.1675013D 07 ZSG 1.8649238D 06
DXSG-9.4797611D 02 DYSG 6.7548414D 02 DZSG-3.0616033D 01
HSG 5.4830401D 07 LTSG 1.8892429D 00 LNSG-4.7486525D 01
VRSG 1.1644204D 03 PTSG-7.7984616D 01 AZSG-8.8360619D 01
LTS-1.5945936D-01 LNS 1.1614279D 02 LTE-5.6320065D 00
LNE-3.5927555D 00 DSMP 4.5625148D-01 RSMP 1.1956059D 02
LIN 1.7539624D 02 LAN-2.3304609D 01 LAP 1.5096377D 02

GEOCENTRIC REFERENCE

X 5.2391106D 07 Y 3.1668218D 08 Z 1.7314211D 08
DX 5.0302552D 00 DY 8.1567052D 02 DZ 3.6480315D 02
R 3.6627646D 08 DEC 2.8210274D 01 RA 7.8854613D 01
V 8.9354633D 02 PTH 7.9481167D 01 AZ 1.1056131D 02
ALT 3.5990307D 08 LTGD 2.8213058D 01 LON 8.1746949D 01
VE 2.3400569D 04 PTE 2.1515607D 00 AZE-9.0140474D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 11 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-4.8135189D 07 YSC-2.6195165D 07 ZSC-9.0464245D 06
DXSC 9.4176899D 02 DYSC 6.1015473D 02 DZSC 2.2176903D 02
RSC 5.5542964D 07 DESC-9.3736685D 00 RASC-1.5144496D 02
VSC 1.1438528D 03 PTSC-8.5324414D 01 AZSC-6.6904159D 01
SELENOGRAPHIC REFERENCE
XSG 3.7354321D 07 YSG-4.1064587D 07 ZSG 1.8371891D 06
DXSG-9.4496019D 02 DYSG 6.8104182D 02 DZSG-3.0754067D 01
HSG 5.3804875D 07 LTSG 1.8955124D 00 LNSG-4.7708836D 01
VRSG 1.1652097D 03 PTSG-7.8070972D 01 AZSG-8.8344295D 01
LTS-1.5925973D-01 LNS 1.1601565D 02 LTE-5.6403940D 00
LNE-3.6062779D 00 DSMP 4.5531380D-01 RSMP 1.1944724D 02
LIN 1.7542641D 02 LAN-2.3270179D 01 LAP 1.5132675D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.3559839D 05
X 6.2395975D 07 Y 3.1741553D 08 Z 1.7346996D 08
DX 5.7983355D 00 DY 8.1399566D 02 DZ 3.6375425D 02
R 3.6706635D 08 DEC 2.8202208D 01 RA 7.8878874D 01
V 8.9159391D 02 PTH 7.9541584D 01 AZ 1.1077867D 02
ALT 3.6069295D 08 LTGD 2.8204986D 01 LON 7.8010944D 01
VE 2.3454421D 04 PTE 2.1423442D 00 AZE-9.0140455D 01

TIME 3 APRIL 1968 11 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-4.7286968D 07 YSC-2.5645915D 07 ZSC-8.8468464D 06
DXSC 9.4317446D 02 DYSC 6.1040667D 02 DZSC 2.2174024D 02
RSC 5.4516392D 07 DESC-9.3391814D 00 RASC-1.5152696D 02
VSC 1.1451389D 03 PTSC-8.5267434D 01 AZSC-6.6922907D 01
SELENOGRAPHIC REFERENCE
XSG 3.6505202D 07 YSG-4.0449147D 07 ZSG 1.8093324D 06
DXSG-9.4196565D 02 DYSG 6.8662657D 02 DZSG-3.0891947D 01
HSG 5.2778303D 07 LTSG 1.9019260D 00 LNSG-4.7933865D 01
VRSG 1.1660659D 03 PTSG-7.8154636D 01 AZSG-8.8327010D 01
LTS-1.5906005D-01 LNS 1.1588850D 02 LTE-5.6487559D 00
LNE-3.6197888D 00 DSMP 4.5437607D-01 RSMP 1.1933388D 02
LIN 1.7545553D 02 LAN-2.3238667D 01 LAP 1.5168062D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.3649839D 05
X 6.2401558D 07 Y 3.1814738D 08 Z 1.7379687D 08
DX 6.6162625D 00 DY 8.1235355D 02 DZ 3.6271885D 02
R 3.6785468D 08 DEC 2.8194142D 01 RA 7.8902853D 01
V 8.8967804D 02 PTH 7.9604644D 01 AZ 1.1100677D 02
ALT 3.6148128D 08 LTGD 2.8196913D 01 LON 7.4274656D 01
VE 2.3508219D 04 PTE 2.1332763D 00 AZE-9.0140454D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - FIRST OPPURTUNITY (CONTINUED)

TIME 3 APRIL 1968 11 HRS., 46 MIN., 4.935 SEC., GMT

SELENCENTRIC REFERENCE

XSC-4.6437461D 07 YSC-2.5096423D 07 ZSC-8.6472876D 06
 DXSC 9.4462803D 02 DYSC 6.1069382D 02 DZSC 2.2172614D 02
 RSC 5.3488726D 07 DESC-9.3035871D 00 RASC-1.5161166D 02
 VSC 1.1464866D 03 PTSC-8.5207278D 01 AZSC-6.6940175D 01

SELENOGRAPHIC REFERENCE

XSG 3.5658769D 07 YSG-3.9828668D 07 ZSG 1.7813537D 06
 DXSG-9.3899394D 02 DYSG 6.9224119D 02 DZSG-3.1029807D 01
 HSG 5.1750636D 07 LTSG 1.9084941D 00 LNSG-4.8161782D 01
 VRSG 1.1669920D 03 PTSG-7.8235458D 01 AZSG-8.8308741D 01
 LTS-1.5886033D-01 LNS 1.1576136D 02 LTE-5.6570922D 00
 LNE-3.6332884D 00 DSMP 4.5343830D-01 RSMP 1.1922051D 02
 LIN 1.7548360D 02 LAN-2.3210267D 01 LAP 1.5202524D 02

GEOCENTRIC REFERENCE

X 6.2407900D 07 Y 3.1887778D 08 Z 1.7412286D 08
 DX 7.4868055D 00 DY 8.1074538D 02 DZ 3.6169731D 02
 R 3.6864149D 08 DEC 2.8186074D 01 RA 7.8926545D 01
 V 8.8780013D 02 PTH 7.9670494D 01 AZ 1.1124647D 02
 ALT 3.6226809D 08 LTGD 2.8188839D 01 LON 7.0538081D 01
 VE 2.3561970D 04 PTE 2.1243594D 00 AZE-9.0140473D 01

FLIGHT TIME

2.3739839D 05
 1.7412286D 08
 3.6169731D 02
 7.8926545D 01
 1.1124647D 02
 7.0538081D 01
 9.0140473D 01

TIME 3 APRIL 1968 12 HRS., 1 MIN., 4.935 SEC., GMT

SELENCENTRIC REFERENCE

XSC-4.5586622D 07 YSC-2.4546655D 07 ZSC-8.4477348D 06
 DXSC 9.4613272D 02 DYSC 6.1101745D 02 DZSC 2.2172712D 02
 RSC 5.2459915D 07 DESC-9.2668126D 00 RASC-1.5169922D 02
 VSC 1.1478991D 03 PTSC-8.5143786D 01 AZSC-6.6955941D 01

SELENOGRAPHIC REFERENCE

XSG 3.4814999D 07 YSG-3.9203120D 07 ZSG 1.7532530D 06
 DXSG-9.3604664D 02 DYSG 6.9788868D 02 DZSG-3.1167792D 01
 HSG 5.0721825D 07 LTSG 1.9152281D 00 LNSG-4.8392774D 01
 VRSG 1.1679912D 03 PTSG-7.8313281D 01 AZSG-8.8289464D 01
 LTS-1.5866057D-01 LNS 1.1563422D 02 LTE-5.6654030D 00
 LNE-3.6467763D 00 DSMP 4.5250049D-01 RSMP 1.1910713D 02
 LIN 1.7551062D 02 LAN-2.3185166D 01 LAP 1.5236046D 02

GEOCENTRIC REFERENCE

X 6.2415051D 07 Y 3.1960674D 08 Z 1.7444793D 08
 DX 8.4129655D 00 DY 8.0917246D 02 DZ 3.6069002D 02
 R 3.6942683D 08 DEC 2.8178003D 01 RA 7.8949944D 01
 V 8.8596170D 02 PTH 7.9739292D 01 AZ 1.1149874D 02
 ALT 3.6305343D 08 LTGD 2.8180761D 01 LON 6.6801214D 01
 VE 2.3615679D 04 PTE 2.1155964D 00 AZE-9.0140513D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 12 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-4.4734406D 07 YSC-2.3996580D 07 ZSC-8.2481742D 06
DXSC 9.4769176D 02 DYSC 6.1137897D 02 DZSC 2.2174360D 02
RSC 5.1429906D 07 DESC-9.2287789D 00 RASC-1.5178984D 02
VSC 1.1493799D 03 PTSC-8.5076788D 01 AZSC-6.6970185D 01
SELENOGRAPHIC REFERENCE
XSG 3.3973869D 07 YSG-3.8572474D 07 ZSG 1.7250301D 06
DXSG-9.3312546D 02 DYSG 7.0357232D 02 DZSG-3.1306059D 01
HSG 4.9691817D 07 LTSG 1.9221400D 00 LNSG-4.8627038D 01
VRSG 1.1690668D 03 PTSG-7.8387931D 01 AZSG-8.8269157D 01
LTS-1.5846075D-01 LNS 1.1550708D 02 LTE-5.6736880D 00
LNE-3.6602526D 00 DSMP 4.5156264D-01 RSMP 1.1899374D 02
LIN 1.7553660D 02 LAN-2.3163542D 01 LAP 1.5268615D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.3919839D 05
X 6.2423061D 07 Y 3.2033430D 08 Z 1.7477210D 08
DX 9.3979987D 00 DY 8.0763618D 02 DZ 3.5969742D 02
R 3.7021074D 08 DEC 2.8169927D 01 RA 7.8973046D 01
V 8.8416444D 02 PTH 7.9811205D 01 AZ 1.1176464D 02
ALT 3.6383733D 08 LTGD 2.8172679D 01 LON 6.3064049D 01
VE 2.3669351D 04 PTE 2.1069901D 00 AZE-9.0140574D 01

TIME 3 APRIL 1968 12 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-4.3880760D 07 YSC-2.3446161D 07 ZSC-8.0485915D 06
DXSC 9.4930870D 02 DYSC 6.1177987D 02 DZSC 2.2177606D 02
KSC 5.0398645D 07 DESC-9.1894001D 00 RASC-1.5188372D 02
VSC 1.1509328D 03 PTSC-8.5006097D 01 AZSC-6.6982884D 01
SELENOGRAPHIC REFERENCE
XSG 3.3135357D 07 YSG-3.7936694D 07 ZSG 1.6966847D 06
DXSG-9.3023225D 02 DYSG 7.0929565D 02 DZSG-3.1444776D 01
HSG 4.8660555D 07 LTSG 1.9292432D 00 LNSG-4.8864794D 01
VRSG 1.1702227D 03 PTSG-7.8459222D 01 AZSG-8.8247797D 01
LTS-1.5826090D-01 LNS 1.1537994D 02 LTE-5.6819474D 00
LNE-3.6737172D 00 DSMP 4.5062474D-01 RSMP 1.1888035D 02
LIN 1.7556155D 02 LAN-2.3145563D 01 LAP 1.5300220D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.4009839D 05
X 6.2431986D 07 Y 3.2106049D 08 Z 1.7509539D 08
DX 1.0445449D 01 DY 8.0613807D 02 DZ 3.5871996D 02
R 3.7099325D 08 DEC 2.8161847D 01 RA 7.8995843D 01
V 8.8241017D 02 PTH 7.9886413D 01 AZ 1.1204537D 02
ALT 3.6461984D 08 LTGD 2.8164592D 01 LON 5.9326580D 01
VE 2.3722993D 04 PTE 2.0985442D 00 AZE-9.0140657D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 12 HRS., 46 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

XSC-4.3025631D 07 YSC-2.2895364D 07 ZSC-7.8489723D 06
DXSC 9.5098740D 02 DYSC 6.1222180D 02 DZSC 2.2182499D 02
RSC 4.9366071D 07 DESC-9.1485830D 00 RASC-1.5198107D 02
VSC 1.1525619D 03 PTSC-8.4931510D 01 AZSC-6.6994016D 01

SELENOGRAPHIC REFERENCE

XSG 3.2299435D 07 YSG-3.7295744D 07 ZSG 1.6682163D 06
DXSG-9.2736899D 02 DYSG 7.1506251D 02 DZSG-3.1584125D 01
HSG 4.7627982D 07 LTSG 1.9365517D 00 LNSG-4.9106275D 01
VRSG 1.1714628D 03 PTSG-7.8526955D 01 AZSG-8.8225364D 01
LTS-1.5806099D-01 LNS 1.1525280D 02 LTE-5.6901810D 00
LNE-3.6871700D 00 DSMP 4.4968679D-01 RSMP 1.1876695D 02
LIN 1.7558548D 02 LAN-2.3131390D 01 LAP 1.5330851D 02

GEOCENTRIC REFERENCE

X 6.2441883D 07 Y 3.2178536D 08 Z 1.7541781D 08
DX 1.1559173D 01 DY 8.0467976D 02 DZ 3.5775817D 02
R 3.7177441D 08 DEC 2.8153759D 01 RA 7.9018330D 01
V 8.8070088D 02 PTH 7.9965109D 01 AZ 1.1234225D 02
ALT 3.6540100D 08 LTGD 2.8156499D 01 LON 5.5588801D 01
VE 2.3776612D 04 PTE 2.0902622D 00 AZE-9.0140764D 01

FLIGHT TIME 2.4099839D 05

TIME 3 APRIL 1968 13 HRS., 1 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

XSC-4.2168963D 07 YSC-2.2344149D 07 ZSC-7.6493014D 06
DXSC 9.5273205D 02 DYSC 6.1270654D 02 DZSC 2.2189094D 02
RSC 4.8332124D 07 DESC-9.1062258D 00 RASC-1.5208213D 02
VSC 1.1542717D 03 PTSC-8.4852807D 01 AZSC-6.7003559D 01

SELENOGRAPHIC REFERENCE

XSG 3.1466076D 07 YSG-3.6649583D 07 ZSG 1.6396243D 06
DXSG-9.2453787D 02 DYSG 7.2087709D 02 DZSG-3.1724303D 01
HSG 4.6594035D 07 LTSG 1.9440812D 00 LNSG-4.9351739D 01
VRSG 1.1727917D 03 PTSG-7.8590908D 01 AZSG-8.8201838D 01
LTS-1.5786104D-01 LNS 1.1512566D 02 LTE-5.6983888D 00
LNE-3.7006110D 00 DSMP 4.4874881D-01 RSMP 1.1865354D 02
LIN 1.7560839D 02 LAN-2.3121171D 01 LAP 1.5360499D 02

GEOCENTRIC REFERENCE

X 6.2452813D 07 Y 3.2250893D 08 Z 1.7573936D 08
DX 1.2743381D 01 DY 8.0326304D 02 DZ 3.5681258D 02
R 3.7255427D 08 DEC 2.8145663D 01 RA 7.9040500D 01
V 8.7903875D 02 PTH 8.0047500D 01 AZ 1.1265679D 02
ALT 3.6618086D 08 LTGD 2.8148397D 01 LON 5.1850703D 01
VE 2.3830215D 04 PTE 2.0821483D 00 AZE-9.0140897D 01

FLIGHT TIME 2.4189839D 05

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - FIRST OPPORTUNITY (CONTINUED)

TIME 3 APRIL 1968 13 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-4.1310692D 07 | YSC-2.1792478D 07 | ZSC-7.4495633D 06 |
| DXSC 9.5454727D 02 | DYSC 6.1323603D 02 | DZSC 2.2197450D 02 |
| RSC 4.7296738D 07 | DESC-9.0622177D 00 | RASC-1.5218716D 02 |
| VSC 1.1560673D 03 | PTSC-8.4769750D 01 | AZSC-6.7011489D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG 3.0635249D 07 | YSG-3.5998165D 07 | ZSG 1.6109077D 06 |
| DXSG-9.2174123D 02 | DYSG 7.2674397D 02 | DZSG-3.1865526D 01 |
| HSG 4.5558648D 07 | LTSG 1.9518484D 00 | LNSG-4.9601465D 01 |
| VRSG 1.1742143D 03 | PTSG-7.8650845D 01 | AZSG-8.8177201D 01 |
| LTS-1.5766104D-01 | LNS 1.1499852D 02 | LTE-5.7065708D 00 |
| LNE-3.7140400D 00 | DSMP 4.4781078D-01 | RSMP 1.1854012D 02 |
| LIN 1.7563031D 02 | LAN-2.3115044D 01 | LAP 1.5389158D 02 |

GEOCENTRIC REFERENCE

| | | |
|-------------------|--------------------|-------------------|
| X 6.2464843D 07 | Y 3.2323124D 08 | Z 1.7606007D 08 |
| DX 1.4002676D 01 | DY 8.0188986D 02 | DZ 3.5588379D 02 |
| R 3.7333289D 08 | DEC 2.8137558D 01 | RA 7.9062344D 01 |
| V 8.7742618D 02 | PTH 8.0133809D 01 | AZ 1.1299066D 02 |
| ALT 3.6695947D 08 | LTGD 2.8140285D 01 | LON 4.8112281D 01 |
| VE 2.3883809D 04 | PTE 2.0742073D 00 | AZE-9.0141057D 01 |

TIME 3 APRIL 1968 13 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-4.0450755D 07 | YSC-2.1240310D 07 | ZSC-7.2497419D 06 |
| DXSC 9.5643808D 02 | DYSC 6.1381237D 02 | DZSC 2.2207632D 02 |
| RSC 4.6259843D 07 | DESC-9.0164374D 00 | RASC-1.5229645D 02 |
| VSC 1.1579539D 03 | PTSC-8.4682076D 01 | AZSC-6.7017780D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG 2.9806924D 07 | YSG-3.5341441D 07 | ZSG 1.5820656D 06 |
| DXSG-9.1898165D 02 | DYSG 7.3266815D 02 | DZSG-3.2008029D 01 |
| HSG 4.4521754D 07 | LTSG 1.9598717D 00 | LNSG-4.9855759D 01 |
| VRSG 1.1757357D 03 | PTSG-7.8706506D 01 | AZSG-8.8151437D 01 |
| LTS-1.5746099D-01 | LNS 1.1487138D 02 | LTE-5.7147270D 00 |
| LNE-3.7274569D 00 | DSMP 4.4687270D-01 | RSMP 1.1842670D 02 |
| LIN 1.7565123D 02 | LAN-2.3113136D 01 | LAP 1.5416822D 02 |

GEOCENTRIC REFERENCE

| | | |
|-------------------|--------------------|-------------------|
| X 6.2478042D 07 | Y 3.2395234D 08 | Z 1.7637996D 08 |
| DX 1.5342098D 01 | DY 8.0056234D 02 | DZ 3.5497246D 02 |
| R 3.7411030D 08 | DEC 2.8129441D 01 | RA 7.9083854D 01 |
| V 8.7586579D 02 | PTH 8.0224274D 01 | AZ 1.1334577D 02 |
| ALT 3.6773688D 08 | LTGD 2.8132162D 01 | LON 4.4373525D 01 |
| VE 2.3937403D 04 | PTE 2.0664442D 00 | AZE-9.0141244D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPURTUNITY
(CONTINUED)

TIME 3 APRIL 1968 13 HRS., 46 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-3.9589080D 07 YSC-2.0687601D 07 ZSC-7.0498203D 06
DXSC 9.5841002D 02 DYSC 6.1443787D 02 DZSC 2.2219710D 02
RSC 4.5221367D 07 DESC-8.9687517D 00 RASC-1.5241030D 02
VSC 1.1599376D 03 PTSC-8.4589500D 01 AZSC-6.7022407D 01

SELENOGRAPHIC REFERENCE

XSG 2.8981064D 07 YSG-3.4679358D 07 ZSG 1.5530967D 06
DXSG-9.1626193D 02 DYSG 7.3865511D 02 DZSG-3.2152066D 01
HSG 4.3483277D 07 LTSG 1.9681710D 00 LNSG-5.0114956D 01
VRSG 1.1773619D 03 PTSG-7.8757607D 01 AZSG-8.8124534D 01
LTS-1.5726089D-01 LNS 1.1474424D 02 LTE-5.7228572D 00
LNE-3.7408618D 00 DSMP 4.4593459D-01 RSMP 1.1831327D 02
LIN 1.7567118D 02 LAN-2.3115560D 01 LAP 1.5443488D 02

GEOCENTRIC REFERENCE

X 6.2492485D 07 Y 3.2467227D 08 Z 1.7669903D 08
DX 1.6767185D 01 DY 7.9928278D 02 DZ 3.5407929D 02
R 3.7488657D 08 DEC 2.8121311D 01 RA 7.9105022D 01
V 8.7436047D 02 PTH 8.0319152D 01 AZ 1.1372428D 02
ALT 3.6851315D 08 LTGD 2.8124026D 01 LON 4.0634427D 01
VE 2.3991006D 04 PTE 2.0588647D 00 AZE-9.0141462D 01

TIME 3 APRIL 1968 14 HRS., 1 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-3.8725591D 07 YSC-2.0134307D 07 ZSC-6.8497812D 06
DXSC 9.6046918D 02 DYSC 6.1511504D 02 DZSC 2.2233762D 02
RSC 4.4181231D 07 DESC-8.9190147D 00 RASC-1.5252905D 02
VSC 1.1620248D 03 PTSC-8.4491710D 01 AZSC-6.7025340D 01

SELENOGRAPHIC REFERENCE

XSG 2.8157632D 07 YSG-3.4011856D 07 ZSG 1.5239995D 06
DXSG-9.1358512D 02 DYSG 7.4471088D 02 DZSG-3.2297920D 01
HSG 4.2443141D 07 LTSG 1.9767684D 00 LNSG-5.0379422D 01
VRSG 1.1790993D 03 PTSG-7.8803839D 01 AZSG-8.8096481D 01
LTS-1.5706073D-01 LNS 1.1461711D 02 LTE-5.7309615D 00
LNE-3.7542545D 00 DSMP 4.4499643D-01 RSMP 1.1819983D 02
LIN 1.7569017D 02 LAN-2.3122419D 01 LAP 1.5469152D 02

GEOCENTRIC REFERENCE

X 6.2508251D 07 Y 3.2539107D 08 Z 1.7701731D 08
DX 1.8284028D 01 DY 7.9805370D 02 DZ 3.5320506D 02
R 3.7566176D 08 DEC 2.8113166D 01 RA 7.9125838D 01
V 8.7291342D 02 PTH 8.0418718D 01 AZ 1.1412864D 02
ALT 3.6928833D 08 LTGD 2.8115875D 01 LON 3.6894976D 01
VE 2.4044627D 04 PTE 2.0514752D 00 AZE-9.0141713D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 14 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-3.7860207D 07 YSC-1.9580378D 07 ZSC-6.6496064D 06
DXSC 9.6262228D 02 DYSC 6.1584663D 02 DZSC 2.2249872D 02
RSC 4.3139352D 07 DESC-8.8670653D 00 RASC-1.5265309D 02
VSC 1.1642227D 03 PTSC-8.4388361D 01 AZSC-6.7026548D 01
SELENOGRAPHIC REFERENCE
XSG 2.7336590D 07 YSG-3.3338870D 07 ZSG 1.4947722D 06
DXSG-9.1095457D 02 DYSG 7.5084207D 02 DZSG-3.2445900D 01
HSG 4.1401263D 07 LTSG 1.9856877D 00 LNSG-5.0649563D 01
VRSG 1.1809550D 03 PTSG-7.8844861D 01 AZSG-8.8067271D 01
LTS-1.5686053D-01 LNS 1.1448997D 02 LTE-5.7390399D 00
LNE-3.7676349D 00 DSMP 4.4405822D-01 RSMP 1.1808638D 02
LIN 1.7570822D 02 LAN-2.3133801D 01 LAP 1.5493816D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.4639839D 05
X 6.2525426D 07 Y 3.2610878D 08 Z 1.7733480D 08
DX 1.9899344D 01 DY 7.9687787D 02 DZ 3.5235062D 02
R 3.7643592D 08 DEC 2.8105005D 01 RA 7.9146291D 01
V 8.7152813D 02 PTH 8.0523269D 01 AZ 1.1456165D 02
ALT 3.7006249D 08 LTGD 2.8107707D 01 LON 3.8155162D 01
VE 2.4098277D 04 PTE 2.0442826D 00 AZE-9.0141997D 01

TIME 3 APRIL 1968 14 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-3.6992840D 07 YSC-1.9025765D 07 ZSC-6.4492770D 06
DXSC 9.6487673D 02 DYSC 6.1663567D 02 DZSC 2.2268131D 02
RSC 4.2095643D 07 DESC-8.8127258D 00 RASC-1.5278281D 02
VSC 1.1665392D 03 PTSC-8.4279076D 01 AZSC-6.7025998D 01
SELENOGRAPHIC REFERENCE
XSG 2.6517893D 07 YSG-3.2660329D 07 ZSG 1.4654127D 06
DXSG-9.0837396D 02 DYSG 7.5705603D 02 DZSG-3.2596349D 01
HSG 4.0357553D 07 LTSG 1.9949553D 00 LNSG-5.0925824D 01
VRSG 1.1829369D 03 PTSG-7.8880299D 01 AZSG-8.8036904D 01
LTS-1.5666028D-01 LNS 1.1436283D 02 LTE-5.7470922D 00
LNE-3.7810030D 00 DSMP 4.4311997D-01 RSMP 1.1797292D 02
LIN 1.7572534D 02 LAN-2.3149781D 01 LAP 1.5517481D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.4729839D 05
X 6.2544101D 07 Y 3.2682547D 08 Z 1.7765154D 08
DX 2.1620564D 01 DY 7.9575831D 02 DZ 3.5151688D 02
R 3.7720912D 08 DEC 2.8096824D 01 RA 7.9166370D 01
V 8.7020851D 02 PTH 8.0633124D 01 AZ 1.1502654D 02
ALT 3.7083569D 08 LTGD 2.8099521D 01 LON 2.9414974D 01
VE 2.4151968D 04 PTE 2.0372947D 00 AZE-9.0142319D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 14 HRS., 46 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-3.6123396D 07 YSC-1.8470416D 07 ZSC-6.2487733D 06
DXSC 9.6724078D 02 DYSC 6.1748546D 02 DZSC 2.2288640D 02
RSC 4.1050008D 07 DESC-8.7557995D 00 RASC-1.5291867D 02
VSC 1.1689830D 03 PTSC-8.4163437D 01 AZSC-6.7023654D 01
SELENOGRAPHIC REFERENCE
XSG 2.5701494D 07 YSG-3.1976155D 07 ZSG 1.4359187D 06
DXSG-9.0584733D 02 DYSG 7.6336086D 02 DZSG-3.2749645D 01
HSG 3.9311918D 07 LTSG 2.0046005D 00 LNSG-5.1208698D 01
VRSG 1.1850535D 03 PTSG-7.8909740D 01 AZSG-8.8005381D 01
LTS-1.5645998D-01 LNS 1.1423570D 02 LTE-5.7551185D 00
LNE-3.7943586D 00 DSMP 4.4218168D-01 RSMP 1.1785946D 02
LIN 1.7574156D 02 LAN-2.3170422D 01 LAP 1.5540148D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.4819839D 05
X 6.2564377D 07 Y 3.2754117D 08 Z 1.7796754D 08
DX 2.3455924D 01 DY 7.9469835D 02 DZ 3.5070486D 02
R 3.7798143D 08 DEC 2.8088623D 01 RA 7.9186062D 01
V 8.6895889D 02 PTH 8.0748623D 01 AZ 1.1552703D 02
ALT 3.7160800D 08 LTGD 2.8091313D 01 LON 2.5674400D 01
VE 2.4205711D 04 PTE 2.0305203D 00 AZE-9.0142679D 01

TIME 3 APRIL 1968 15 HRS., 1 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-3.5251771D 07 YSC-1.7914272D 07 ZSC-6.0480744D 06
DXSC 9.6972357D 02 DYSC 6.1839966D 02 DZSC 2.2311511D 02
RSC 4.0002346D 07 DESC-8.6960680D 00 RASC-1.5306119D 02
VSC 1.1715640D 03 PTSC-8.4040984D 01 AZSC-6.7019473D 01
SELENOGRAPHIC REFERENCE
XSG 2.4887344D 07 YSG-3.1286262D 07 ZSG 1.4062874D 06
DXSG-9.0337911D 02 DYSG 7.6976558D 02 DZSG-3.2906208D 01
HSG 3.8264257D 07 LTSG 2.0146552D 00 LNSG-5.1498733D 01
VRSG 1.1873145D 03 PTSG-7.8932728D 01 AZSG-8.7972713D 01
LTS-1.5625962D-01 LNS 1.1410856D 02 LTE-5.7631186D 00
LNE-3.8077018D 00 DSMP 4.4124334D-01 RSMP 1.1774598D 02
LIN 1.7575688D 02 LAN-2.3195772D 01 LAP 1.5561823D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.4909839D 05
X 6.2586359D 07 Y 3.2825594D 08 Z 1.7828282D 08
DX 2.5414584D 01 DY 7.9370164D 02 DZ 3.4991568D 02
R 3.7875293D 08 DEC 2.8080397D 01 RA 7.9205353D 01
V 8.6778406D 02 PTH 8.0870134D 01 AZ 1.1606742D 02
ALT 3.7237949D 08 LTGD 2.8083082D 01 LON 2.1933425D 01
VE 2.4259521D 04 PTE 2.0239688D 00 AZE-9.0143083D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 15 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-3.4377855D 07 YSC-1.7357276D 07 ZSC-5.8471586D 06
DXSC 9.7233532D 02 DYSC 6.1938230D 02 DZSC 2.2336865D 02
RSC 3.8952550D 07 DESC-8.6332878D 00 RASC-1.5321092D 02
VSC 1.1742930D 03 PTSC-8.3911204D 01 AZSC-6.7013413D 01
SELENOGRAPHIC REFERENCE
XSG 2.4075387D 07 YSG-3.0590556D 07 ZSG 1.3765157D 06
DXSG-9.0097424D 02 DYSG 7.7628021D 02 DZSG-3.3066510D 01
HSG 3.7214461D 07 LTSG 2.0251552D 00 LNSG-5.1796536D 01
VRSG 1.1897306D 03 PTSG-7.8948756D 01 AZSG-8.7938915D 01
LTS-1.5605921D-01 LNS 1.1398143D 02 LTE-5.7710927D 00
LNE-3.8210324D 00 DSMP 4.4030496D-01 RSMP 1.1763250D 02
LIN 1.7577134D 02 LAN-2.3225867D 01 LAP 1.5582512D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.4999839D 05
X 6.2610163D 07 Y 3.2896985D 08 Z 1.7859740D 08
DX 2.7506756D 01 DY 7.9277221D 02 DZ 3.4915055D 02
R 3.7952368D 08 DEC 2.8072146D 01 RA 7.9224229D 01
V 8.6668939D 02 PTH 8.0998048D 01 AZ 1.1665272D 02
ALT 3.7315025D 08 LTGD 2.8074824D 01 LON 1.8192034D 01
VE 2.4313413D 04 PTE 2.0176511D 00 AZE-9.0143532D 01

TIME 3 APRIL 1968 15 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-3.3501526D 07 YSC-1.6799362D 07 ZSC-5.6460030D 06
DXSC 9.7508746D 02 DYSC 6.2043781D 02 DZSC 2.2364836D 02
RSC 3.7900503D 07 DESC-8.5671874D 00 RASC-1.5336849D 02
VSC 1.1771819D 03 PTSC-8.3773529D 01 AZSC-6.7005421D 01
SELENOGRAPHIC REFERENCE
XSG 2.3265563D 07 YSG-2.9888933D 07 ZSG 1.3466000D 06
DXSG-8.9863813D 02 DYSG 7.8291599D 02 DZSG-3.3231076D 01
HSG 3.6162413D 07 LTSG 2.0361401D 00 LNSG-5.2102786D 01
VRSG 1.1923138D 03 PTSG-7.8957262D 01 AZSG-8.7904010D 01
LTS-1.5585874D-01 LNS 1.1385429D 02 LTE-5.7790405D 00
LNE-3.8343504D 00 DSMP 4.3936654D-01 RSMP 1.1751901D 02
LIN 1.7578495D 02 LAN-2.3260728D 01 LAP 1.5602224D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.6089839D 05
X 6.2635915D 07 Y 3.2968295D 08 Z 1.7891130D 08
DX 2.9743865D 01 DY 7.9191452D 02 DZ 3.4841081D 02
R 3.8029378D 08 DEC 2.8063866D 01 RA 7.9242674D 01
V 8.6568088D 02 PTH 8.1132784D 01 AZ 1.1728881D 02
ALT 3.7392034D 08 LTGD 2.8066538D 01 LON 1.4450212D 01
VE 2.4367402D 04 PTE 2.0115792D 00 AZE-9.0144030D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 15 HRS., 46 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-3.2622651D 07 YSC-1.6240464D 07 ZSC-5.4445833D 06
 DXSC 9.7799279D 02 DYSC 6.2157113D 02 DZSC 2.2395570D 02
 RSC 3.6846079D 07 DESC-8.4974619D 00 RASC-1.5353459D 02
 VSC 1.1802444D 03 PTSC-8.3627323D 01 AZSC-6.6995443D 01

SELENOGRAPHIC REFERENCE

XSG 2.2457810D 07 YSG-2.9181279D 07 ZSG 1.3165361D 06
 DXSG-8.9637685D 02 DYSG 7.8968549D 02 DZSG-3.3400497D 01
 HSG 3.5107989D 07 LTSG 2.0476539D 00 LNSG-5.2418243D 01
 VRSG 1.1950775D 03 PTSG-7.8957618D 01 AZSG-8.7868032D 01
 LTS-1.5565822D-01 LNS 1.1372716D 02 LTE-5.7869622D 00
 LNE-3.8476556D 00 DSMP 4.3842807D-01 RSMP 1.1740551D 02
 LIN 1.7579773D 02 LAN-2.3300365D 01 LAP 1.5620966D 02

GEOCENTRIC REFERENCE

X 6.2663750D 07 Y 3.3039532D 08 Z 1.7922454D 08
 DX 3.2138735D 01 DY 7.9113351D 02 DZ 3.4769794D 02
 R 3.8106331D 08 DEC 2.8055554D 01 RA 7.9260669D 01
 V 8.6476527D 02 PTH 8.1274786D 01 AZ 1.1798262D 02
 ALT 3.7468987D 08 LTGD 2.8058220D 01 LON 1.0707941D 01
 VE 2.4421508D 04 PTE 2.0057663D 00 AZE-9.0144582D 01

TIME 3 APRIL 1968 16 HRS., 1 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-3.1741088D 07 YSC-1.5680509D 07 ZSC-5.2428740D 06
 DXSC 9.8106576D 02 DYSC 6.2278775D 02 DZSC 2.2429232D 02
 RSC 3.5789143D 07 DESC-8.4237689D 00 RASC-1.5371002D 02
 VSC 1.1834955D 03 PTSC-8.3471876D 01 AZSC-6.6983416D 01

SELENOGRAPHIC REFERENCE

XSG 2.1652055D 07 YSG-2.8467467D 07 ZSG 1.2863195D 06
 DXSG-8.9419711D 02 DYSG 7.9660289D 02 DZSG-3.3575441D 01
 HSG 3.4051054D 07 LTSG 2.0597462D 00 LNSG-5.2743761D 01
 VRSG 1.1980367D 03 PTSG-7.8949119D 01 AZSG-8.7831026D 01
 LTS-1.5545765D-01 LNS 1.1360002D 02 LTE-5.7948576D 00
 LNE-3.8609480D 00 DSMP 4.3748956D-01 RSMP 1.1729200D 02
 LIN 1.7580971D 02 LAN-2.3344772D 01 LAP 1.5638751D 02

GEOCENTRIC REFERENCE

X 6.2693816D 07 Y 3.3110702D 08 Z 1.7953716D 08
 DX 3.4705810D 01 DY 7.9043466D 02 DZ 3.4701358D 02
 R 3.8183238D 08 DEC 2.8047206D 01 RA 7.9278194D 01
 V 8.6395015D 02 PTH 8.1424522D 01 AZ 1.1874236D 02
 ALT 3.7545894D 08 LTGD 2.8049867D 01 LON 6.9651997D 00
 VE 2.4475750D 04 PTE 2.0002276D 00 AZE-9.0145193D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 16 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-3.0856678D 07 YSC-1.5119420D 07 ZSC-5.0408478D 06
DXSC 9.8432271D 02 DYSC 6.2409376D 02 DZSC 2.2466001D 02
RSC 3.4729549D 07 DESC-8.3457212D 00 RASC-1.5389567D 02
VSC 1.1869525D 03 PTSC-8.3306390D 01 AZSC-6.6969268D 01
SELENOGRAPHIC REFERENCE
XSG 2.0848222D 07 YSG-2.7747356D 07 ZSG 1.2559447D 06
DXSG-8.9210641D 02 DYSG 8.0368418D 02 DZSG-3.3756666D 01
HSG 3.2991459D 07 LTSG 2.0724722D 00 LNSG-5.3080303D 01
VRSG 1.2012084D 03 PTSG-7.8930977D 01 AZSG-8.7793046D 01
LTS-1.5525702D-01 LNS 1.1347289D 02 LTE-5.8027267D 00
LNE-3.8742275D 00 DSMP 4.3655101D-01 RSMP 1.1717848D 02
LIN 1.7582091D 02 LAN-2.3393932D 01 LAP 1.5655590D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.5359839D 05
X 5.2726277D 07 Y 3.3181813D 08 Z 1.7984918D 08
DX 3.7461424D 01 DY 7.8982408D 02 DZ 3.4635953D 02
R 3.8260107D 08 DEC 2.8038820D 01 RA 7.9295229D 01
V 8.6324409D 02 PTH 8.1582482D 01 AZ 1.1957783D 02
ALT 3.7622763D 08 LTGD 2.8041475D 01 LON 3.2219679D 00
VE 2.4530150D 04 PTE 1.9949800D 00 AZE-9.0145867D 01

TIME 3 APRIL 1968 16 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-2.9969247D 07 YSC-1.4557112D 07 ZSC-4.8384760D 06
DXSC 9.8778216D 02 DYSC 6.2549596D 02 DZSC 2.2506078D 02
RSC 3.3667136D 07 DESC-8.2628803D 00 RASC-1.5409252D 02
VSC 1.1906348D 03 PTSC-8.3129963D 01 AZSC-6.6952921D 01
SELENOGRAPHIC REFERENCE
XSG 2.0046229D 07 YSG-2.7020791D 07 ZSG 1.2254059D 06
DXSG-8.9011316D 02 DYSG 8.1094753D 02 DZSG-3.3945035D 01
HSG 3.1929047D 07 LTSG 2.0858945D 00 LNSG-5.3428957D 01
VRSG 1.2046118D 03 PTSG-7.8902301D 01 AZSG-8.7754164D 01
LTS-1.5505633D-01 LNS 1.1334576D 02 LTE-5.8105695D 00
LNE-3.8874940D 00 DSMP 4.3561241D-01 RSMP 1.1706496D 02
LIN 1.7583135D 02 LAN-2.3447815D 01 LAP 1.5671498D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.5449839D 05
X 6.2761309D 07 Y 3.3252873D 08 Z 1.8016062D 08
DX 4.0424120D 01 DY 7.8930860D 02 DZ 3.4573780D 02
R 3.8336952D 08 DEC 2.8030391D 01 RA 7.9311749D 01
V 8.6265682D 02 PTH 8.1749171D 01 AZ 1.2050082D 02
ALT 3.7699607D 08 LTGD 2.8033040D 01 LON 3.5947818D 02
VE 2.4584735D 04 PTE 1.9900423D 00 AZE-9.0146611D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 16 HRS., 46 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-2.9078603D 07 YSC-1.3993496D 07 ZSC-4.6357278D 06
DXSC 9.9146527D 02 DYSC 6.2700201D 02 DZSC 2.2549683D 02
RSC 3.2601733D 07 DESC-8.1747465D 00 RASC-1.5430174D 02
VSC 1.1945642D 03 PTSC-8.2941576D 01 AZSC-6.6934285D 01
SELENOGRAPHIC REFERENCE
XSG 1.9245981D 07 YSG-2.6287600D 07 ZSG 1.1946961D 06
DXSG-9.8822681D 02 DYSG 8.1841365D 02 DZSG-3.4141534D 01
HSG 3.0863644D 07 LTSG 2.1000837D 00 LNSG-5.3790962D 01
VRSG 1.2082688D 03 PTSG-7.8862080D 01 AZSG-8.7714466D 01
LTS-1.5485559D-01 LNS 1.1321863D 02 LTE-5.8183859D 00
LNE-3.9007475D 00 DSMP 4.3467376D-01 RSMP 1.1695142D 02
LIN 1.7584105D 02 LAN-2.3506381D 01 LAP 1.5686491D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.5539839D 05
X 6.2799108D 07 Y 3.3323891D 08 Z 1.8047152D 08
DX 4.3615041D 01 DY 7.8889585D 02 DZ 3.4515060D 02
R 3.8413783D 08 DEC 2.8021916D 01 RA 7.9327728D 01
V 8.6219943D 02 PTH 8.1925098D 01 AZ 1.2152559D 02
ALT 3.7776438D 08 LTGD 2.8024559D 01 LON 3.5573390D 02
VE 2.4639532D 04 PTE 1.9854362D 00 AZE-9.0147432D 01

TIME 3 APRIL 1968 17 HRS., 1 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-2.8184535D 07 YSC-1.3428474D 07 ZSC-4.4325704D 06
DXSC 9.9539625D 02 DYSC 6.2862047D 02 DZSC 2.2597064D 02
RSC 3.1533151D 07 DESC-8.0807487D 00 RASC-1.5452460D 02
VSC 1.1987661D 03 PTSC-8.2740069D 01 AZSC-6.6913259D 01
SELENOGRAPHIC REFERENCE
XSG 1.8447380D 07 YSG-2.5547589D 07 ZSG 1.1638075D 06
DXSG-8.8645800D 02 DYSG 8.2610625D 02 DZSG-3.4347301D 01
HSG 2.9795061D 07 LTSG 2.1151201D 00 LNSG-5.4167734D 01
VRSG 1.2122042D 03 PTSG-7.8809168D 01 AZSG-8.7674056D 01
LTS-1.5465479D-01 LNS 1.1309150D 02 LTE-5.8261760D 00
LNE-3.9139879D 00 DSMP 4.3373508D-01 RSMP 1.1683788D 02
LIN 1.7585004D 02 LAN-2.3569575D 01 LAP 1.5700584D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.5629839D 05
X 6.2839892D 07 Y 3.3394878D 08 Z 1.8078190D 08
DX 4.7058410D 01 DY 7.8859441D 02 DZ 3.4460041D 02
R 3.8490614D 08 DEC 2.8013388D 01 RA 7.9343136D 01
V 8.6188461D 02 PTH 8.2110762D 01 AZ 1.2266958D 02
ALT 3.7853268D 08 LTGD 2.8016025D 01 LON 3.5198904D 02
VE 2.4694574D 04 PTE 1.9811858D 00 AZE-9.0148337D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 17 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-2.7286807D 07 YSC-1.2861942D 07 ZSC-4.2289685D 06
DXSC 9.9960299D 02 DYSC 6.3036101D 02 DZSC 2.2648496D 02
RSC 3.0461181D 07 DESC-7.9802297D 00 RASC-1.5476262D 02
VSC 1.2032691D 03 PTSC-8.2524119D 01 AZSC-6.6889727D 01
SELENOGRAPHIC REFERENCE
XSG 1.7650313D 07 YSG-2.4800543D 07 ZSG 1.1327312D 06
DXSG-8.8481880D 02 DYSG 8.3405262D 02 DZSG-3.4563650D 01
HSG 2.8723092D 07 LTSG 2.1310953D 00 LNSG-5.4560897D 01
VRSG 1.2164468D 03 PTSG-7.8742252D 01 AZSG-8.7633061D 01
LTS-1.5445393D-01 LNS 1.1296436D 02 LTE-5.8339396D 00
LNE-3.9272151D 00 DSMP 4.3279635D-01 RSMP 1.1672432D 02
LIN 1.7585835D 02 LAN-2.3637333D 01 LAP 1.5713795D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.5719839D 05
X 6.2883898D 07 Y 3.3465842D 08 Z 1.8109181D 08
DX 5.0782113D 01 DY 7.8841397D 02 DZ 3.4408999D 02
R 3.8567459D 08 DEC 2.8004804D 01 RA 7.9357941D 01
V 8.6172694D 02 PTH 8.2306619D 01 AZ 1.2395422D 02
ALT 3.7930113D 08 LTGD 2.8007435D 01 LON 3.4824358D 02
VE 2.4749896D 04 PTE 1.9773188D 00 AZE-9.0149336D 01

TIME 3 APRIL 1968 17 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-2.6385157D 07 YSC-1.2293785D 07 ZSC-4.0248844D 06
DXSC 1.0041178D 03 DYSC 6.3223456D 02 DZSC 2.2704287D 02
RSC 2.9385597D 07 DESC-7.8724305D 00 RASC-1.5501750D 02
VSC 1.2081066D 03 PTSC-8.2292205D 01 AZSC-6.6863559D 01
SELENOGRAPHIC REFERENCE
XSG 1.6854658D 07 YSG-2.4046219D 07 ZSG 1.1014570D 06
DXSG-8.8332288D 02 DYSG 8.4228436D 02 DZSG-3.4792114D 01
HSG 2.7647508D 07 LTSG 2.1481143D 00 LNSG-5.4972323D 01
VRSG 1.2210294D 03 PTSG-7.8659828D 01 AZSG-8.7591633D 01
LTS-1.5425302D-01 LNS 1.1283723D 02 LTE-5.8416767D 00
LNE-3.9404290D 00 DSMP 4.3185758D-01 RSMP 1.1661076D 02
LIN 1.7586600D 02 LAN-2.3709580D 01 LAP 1.5726144D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.5809839D 05
X 6.2931393D 07 Y 3.3536796D 08 Z 1.8140128D 08
DX 5.4818433D 01 DY 7.8836546D 02 DZ 3.4362241D 02
R 3.8644334D 08 DEC 2.7996156D 01 RA 7.9372105D 01
V 8.6174330D 02 PTH 8.2513047D 01 AZ 1.2540613D 02
ALT 3.8006988D 08 LTGD 2.7998782D 01 LON 3.4449747D 02
VE 2.4805540D 04 PTE 1.9738667D 00 AZE-9.0150438D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 17 HRS., 46 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-2.5479291D 07 YSC-1.1723876D 07 ZSC-3.8202772D 06
 DXSC 1.0089781D 03 DYSC 6.3425356D 02 DZSC 2.2764780D 02
 RSC 2.8306149D 07 DESC-7.7564685D 00 RASC-1.5529125D 02
 VSC 1.2133169D 03 PTSC-8.2042572D 01 AZSC-6.6834608D 01
 SELENOGRAPHIC REFERENCE
 XSG 1.6060279D 07 YSG-2.3284344D 07 ZSG 1.0699733D 06
 DXSG-8.8198588D 02 DYSG 8.5083823D 02 DZSG-3.5034485D 01
 HSG 2.6568060D 07 LTSG 2.1662981D 00 LNSG-5.5404188D 01
 VRSG 1.2259903D 03 PTSG-7.8560154D 01 AZSG-8.7549951D 01
 LTS-1.5405204D-01 LNS 1.1271010D 02 LTE-5.8493873D 00
 LNE-3.9536295D 00 DSMP 4.3091876D-01 RSMP 1.1649719D 02
 LIN 1.7587301D 02 LAN-2.3786230D 01 LAP 1.5737652D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.5899839D 05
 X 6.2982676D 07 Y 3.3607752D 08 Z 1.8171034D 08
 DX 5.9204952D 01 DY 7.8846131D 02 DZ 3.4320111D 02
 R 3.8721256D 08 DEC 2.7987440D 01 RA 7.9385588D 01
 V 8.6195329D 02 PTH 8.2730275D 01 AZ 1.2705860D 02
 ALT 3.8083910D 08 LTGD 2.7990060D 01 LON 3.4075069D 02
 VE 2.4861553D 04 PTE 1.9708656D 00 AZE-9.0151656D 01

TIME 3 APRIL 1968 18 HRS., 1 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-2.4568880D 07 YSC-1.1152080D 07 ZSC-3.6151031D 06
 DXSC 1.0142282D 03 DYSC 6.3643213D 02 DZSC 2.2830359D 02
 RSC 2.7222559D 07 DESC-7.6313113D 00 RASC-1.5558618D 02
 VSC 1.2189451D 03 PTSC-8.1773182D 01 AZSC-6.6802706D 01
 SELENOGRAPHIC REFERENCE
 XSG 1.5267026D 07 YSG-2.2514609D 07 ZSG 1.0382665D 06
 DXSG-8.8082568D 02 DYSG 8.5975734D 02 DZSG-3.5292882D 01
 HSG 2.5484469D 07 LTSG 2.1857871D 00 LNSG-5.5859029D 01
 VRSG 1.2313741D 03 PTSG-7.8441210D 01 AZSG-8.7508227D 01
 LTS-1.5385101D-01 LNS 1.1258298D 02 LTE-5.8570713D 00
 LNE-3.9668166D 00 DSMP 4.2997990D-01 RSMP 1.1638361D 02
 LIN 1.7587941D 02 LAN-2.3867190D 01 LAP 1.5748339D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.5989839D 05
 X 6.3038080D 07 Y 3.3678724D 08 Z 1.8201905D 08
 DX 6.3985711D 01 DY 7.8871568D 02 DZ 3.4282995D 02
 R 3.8798245D 08 DEC 2.7978647D 01 RA 7.9398342D 01
 V 8.6237983D 02 PTH 8.2958286D 01 AZ 1.2895366D 02
 ALT 3.8160898D 08 LTGD 2.7981261D 01 LON 3.3700318D 02
 VE 2.4917990D 04 PTE 1.9683569D 00 AZE-9.0153005D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 18 HRS., 16 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-2.3653548D 07 YSC-1.0578246D 07 ZSC-3.4093142D 06
 DXSC 1.0199198D 03 DYSC 6.3878648D 02 DZSC 2.2901458D 02
 RSC 2.6134518D 07 DESC-7.4957430D 00 RASC-1.5590503D 02
 VSC 1.2250438D 03 PTSC-8.1481655D 01 AZSC-6.6767661D 01
 SELENOGRAPHIC REFERENCE
 XSG 1.4474729D 07 YSG-2.1736664D 07 ZSG 1.0063212D 06
 DXSG-8.7986289D 02 DYSG 8.6909254D 02 DZSG-3.5569820D 01
 HSG 2.4396429D 07 LTSG 2.2067448D 00 LNSG-5.6339831D 01
 VRSG 1.2372331D 03 PTSG-7.8300635D 01 AZSG-8.7466714D 01
 LTS-1.5364991D-01 LNS 1.1245585D 02 LTE-5.8647287D 00
 LNE-3.9799902D 00 DSMP 4.2904099D-01 RSMP 1.1627001D 02
 LIN 1.7588523D 02 LAN-2.3952355D 01 LAP 1.5758228D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.6079839D 05
 X 6.3097984D 07 Y 3.3749726D 08 Z 1.8232745D 08
 DX 6.9212664D 01 DY 7.8914477D 02 DZ 3.4251325D 02
 R 3.8875321D 08 DEC 2.7969769D 01 RA 7.9410315D 01
 V 8.6304993D 02 PTH 8.3196654D 01 AZ 1.3114475D 02
 ALT 3.8237974D 08 LTGD 2.7972378D 01 LON 3.3325488D 02
 VE 2.4974916D 04 PTE 1.9663886D 00 AZE-9.0154500D 01

TIME 3 APRIL 1968 18 HRS., 31 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-2.2732873D 07 YSC-1.0002206D 07 ZSC-3.2028588D 06
 DXSC 1.0261148D 03 DYSC 6.4133520D 02 DZSC 2.2978561D 02
 RSC 2.5041684D 07 DESC-7.3483209D 00 RASC-1.5625104D 02
 VSC 1.2316752D 03 PTSC-8.1165189D 01 AZSC-6.6729260D 01
 SELENOGRAPHIC REFERENCE
 XSG 1.3683202D 07 YSG-2.0950108D 07 ZSG 9.7411944D 05
 DXSG-8.7912134D 02 DYSG 8.7890429D 02 DZSG-3.5868315D 01
 HSG 2.3303595D 07 LTSG 2.2293634D 00 LNSG-5.6850128D 01
 VRSG 1.2436292D 03 PTSG-7.8135648D 01 AZSG-8.7425708D 01
 LTS-1.5344875D-01 LNS 1.1232872D 02 LTE-5.8723595D 00
 LNE-3.9931502D 00 DSMP 4.2810204D-01 RSMP 1.1615641D 02
 LIN 1.7589049D 02 LAN-2.4041613D 01 LAP 1.5767342D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.6169839D 05
 X 6.3162815D 07 Y 3.3820776D 08 Z 1.8263559D 08
 DX 7.4947570D 01 DY 7.8976717D 02 DZ 3.4225587D 02
 R 3.8952508D 08 DEC 2.7960798D 01 RA 7.9421446D 01
 V 8.6399560D 02 PTH 8.3444301D 01 AZ 1.3370018D 02
 ALT 3.8315161D 08 LTGD 2.7963400D 01 LON 3.2950575D 02
 VE 2.5032405D 04 PTE 1.9650161D 00 AZE-9.0156162D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 18 HRS., 46 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-2.1806369D 07 | YSC-9.4237777D 06 | ZSC-2.9956805D 06 |
| DXSC 1.0328871D 03 | DYSC 6.4409974D 02 | DZSC 2.3062212D 02 |
| RSC 2.3943671D 07 | DESC-7.1873194D 00 | RASC-1.5662806D 02 |
| VSC 1.2389136D 03 | PTSC-8.0820464D 01 | AZSC-6.6687256D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG 1.2892232D 07 | YSG-2.0154480D 07 | ZSG 9.4164016D 05 |
| DXSG-8.7862872D 02 | DYSG 8.8926507D 02 | DZSG-3.6192014D 01 |
| HSG 2.2205582D 07 | LTSG 2.2538700D 00 | LNSG-5.7394137D 01 |
| VRSG 1.2506361D 03 | PTSG-7.7942949D 01 | AZSG-8.7385561D 01 |
| LTS-1.5324753D-01 | LNS 1.1220159D 02 | LTE-5.8799637D 00 |
| LNE-4.0062965D 00 | DSMP 4.2716305D-01 | RSMP 1.1604280D 02 |
| LIN 1.7589522D 02 | LAN-2.4134846D 01 | LAP 1.5775706D 02 |

GEOCENTRIC REFERENCE

| | | |
|-------------------|--------------------|-------------------|
| X 6.3233064D 07 | Y 3.3891891D 08 | Z 1.8294353D 08 |
| DX 8.1264443D 01 | DY 7.9060435D 02 | DZ 3.4206323D 02 |
| R 3.9029833D 08 | DEC 2.7951722D 01 | RA 7.9431667D 01 |
| V 8.6525511D 02 | PTH 8.3699115D 01 | AZ 1.3670750D 02 |
| ALT 3.8392485D 08 | LTGD 2.7954319D 01 | LON 3.2575570D 02 |
| VE 2.5090545D 04 | PTE 1.9643043D 00 | AZE-9.0158014D 01 |

FLIGHT TIME 2.6259839D 05

TIME 3 APRIL 1968 19 HRS., 1 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-2.0873476D 07 | YSC-8.8427547D 06 | ZSC-2.7877176D 06 |
| DXSC 1.0403264D 03 | DYSC 6.4710494D 02 | DZSC 2.3153018D 02 |
| RSC 2.2840046D 07 | DESC-7.0106557D 00 | RASC-1.5704073D 02 |
| VSC 1.2468480D 03 | PTSC-8.0443509D 01 | AZSC-6.6641374D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG 1.2101582D 07 | YSG-1.9349248D 07 | ZSG 9.0885879D 05 |
| DXSG-8.7841740D 02 | DYSG 9.0026259D 02 | DZSG-3.6545373D 01 |
| HSG 2.1101956D 07 | LTSG 2.2805349D 00 | LNSG-5.7976939D 01 |
| VRSG 1.2583423D 03 | PTSG-7.7718593D 01 | AZSG-8.7346689D 01 |
| LTS-1.5304625D-01 | LNS 1.1207446D 02 | LTE-5.8875411D 00 |
| LNE-4.0194290D 00 | DSMP 4.2622402D-01 | RSMP 1.1592918D 02 |
| LIN 1.7589945D 02 | LAN-2.4231924D 01 | LAP 1.5783345D 02 |

GEOCENTRIC REFERENCE

| | | |
|-------------------|--------------------|-------------------|
| X 6.3309293D 07 | Y 3.3963092D 08 | Z 1.8325133D 08 |
| DX 8.8252794D 01 | DY 7.9168115D 02 | DZ 3.4194144D 02 |
| R 3.9107324D 08 | DEC 2.7942529D 01 | RA 7.9440897D 01 |
| V 8.6687459D 02 | PTH 8.3957350D 01 | AZ 1.4027850D 02 |
| ALT 3.8469976D 08 | LTGD 2.7945121D 01 | LON 3.2200467D 02 |
| VE 2.5149443D 04 | PTE 1.9643291D 00 | AZE-9.0160085D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 19 HRS., 16 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-1.9933549D 07 YSC-8.2589080D 06 ZSC-2.5789027D 06
 DXSC 1.0485418D 03 DYSC 6.5037970D 02 DZSC 2.3251658D 02
 RSC 2.1730316D 07 DESC-6.8157911D 00 RASC-1.5749469D 02
 VSC 1.2555866D 03 PTSC-8.0029532D 01 AZSC-6.6591304D 01
 SELENOGRAPHIC REFERENCE
 XSG 1.1310981D 07 YSG-1.8533792D 07 ZSG 8.7574624D 05
 DXSG-8.7852545D 02 DYSG 9.1200405D 02 DZSG-3.6933889D 01
 HSG 1.9992227D 07 LTSG 2.3096835D 00 LNSG-5.8604713D 01
 VRSG 1.2668553D 03 PTSG-7.7457813D 01 AZSG-8.7309589D 01
 LTS-1.5284491D-01 LNS 1.1194734D 02 LTE-5.8950918D 00
 LNE-4.0325477D 00 DSMP 4.2528494D-01 RSMP 1.1581555D 02
 LIN 1.7590320D 02 LAN-2.4332717D 01 LAP 1.5790284D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.6439839D 05
 X 6.3392153D 07 Y 3.4034401D 08 Z 1.8355905D 08
 DX 9.6021964D 01 DY 7.9302649D 02 DZ 3.4189728D 02
 R 3.9185015D 08 DEC 2.7933207D 01 RA 7.9449042D 01
 V 8.6891022D 02 PTH 8.4212710D 01 AZ 1.4455375D 02
 ALT 3.8547667D 08 LTGD 2.7935792D 01 LON 3.1825255D 02
 VE 2.5209225D 04 PTE 1.9651800D 00 AZE-9.0162408D 01

TIME 3 APRIL 1968 19 HRS., 31 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-1.8985828D 07 YSC-7.6719803D 06 ZSC-2.3691620D 06
 DXSC 1.0576685D 03 DYSC 6.5395774D 02 DZSC 2.3358883D 02
 RSC 2.0613924D 07 DESC-6.5995974D 00 RASC-1.5799686D 02
 VSC 1.2652617D 03 PTSC-7.9572692D 01 AZSC-6.6536702D 01
 SELENOGRAPHIC REFERENCE
 XSG 1.0520123D 07 YSG-1.7707385D 07 ZSG 8.4226794D 05
 DXSG-8.7899784D 02 DYSG 9.2462196D 02 DZSG-3.7364433D 01
 HSG 1.8875835D 07 LTSG 2.3417100D 00 LNSG-5.9285054D 01
 VRSG 1.2763068D 03 PTSG-7.7154797D 01 AZSG-8.7274854D 01
 LTS-1.5264350D-01 LNS 1.1182021D 02 LTE-5.9026157D 00
 LNE-4.0456525D 00 DSMP 4.2434582D-01 RSMP 1.1570191D 02
 LIN 1.7590649D 02 LAN-2.4437083D 01 LAP 1.5796550D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.6529839D 05
 X 6.3482407D 07 Y 3.4105846D 08 Z 1.8386677D 08
 DX 1.0470700D 02 DY 7.9467408D 02 DZ 3.4193825D 02
 R 3.9262944D 08 DEC 2.7923737D 01 RA 7.9455994D 01
 V 8.7143113D 02 PTH 8.4454966D 01 AZ 1.4970369D 02
 ALT 3.8625596D 08 LTGD 2.7926317D 01 LON 3.1449923D 02
 VE 2.5270048D 04 PTE 1.9669633D 00 AZE-9.0165027D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 19 HRS., 46 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

| | | | | | |
|-----------------|----|-----------------|----|-----------------|----|
| XSC-1.8029422D | 07 | YSC-7.0816813D | 06 | ZSC-2.1584146D | 06 |
| DXSC 1.0678754D | 03 | DYSC 6.5787856D | 02 | DZSC 2.3475510D | 02 |
| RSC 1.9490228D | 07 | DESC-6.3581719D | 00 | RASC-1.5855585D | 02 |
| VSC 1.2760376D | 03 | PTSC-7.9065784D | 01 | AZSC-6.6477193D | 01 |

SELENOGRAPHIC REFERENCE

| | | | | | |
|-----------------|----|-----------------|----|-----------------|----|
| XSG 9.7286560D | 06 | YSG-1.6869166D | 07 | ZSG 8.0838230D | 05 |
| DXSG-8.7988802D | 02 | DYSG 9.3828219D | 02 | DZSG-3.7845709D | 01 |
| HSG 1.7752139D | 07 | LTSG 2.3770979D | 00 | LNSG-6.0027418D | 01 |
| VRSG 1.2868600D | 03 | PTSG-7.6802369D | 01 | AZSG-8.7243206D | 01 |
| LTS-1.5244203D | 01 | LNS 1.1169309D | 02 | LTE-5.9101128D | 00 |
| LNE-4.0587433D | 00 | DSMP 4.2340665D | 01 | RSMP 1.1558826D | 02 |
| LIN 1.7590937D | 02 | LAN-2.4544877D | 01 | LAP 1.5802170D | 02 |

GEOCENTRIC REFERENCE

| | | | | | |
|----------------|----|-----------------|----|----------------|----|
| X 6.3580951D | 07 | Y 3.4177453D | 08 | Z 1.8417457D | 08 |
| DX 1.1447681D | 02 | DY 7.9666344D | 02 | DZ 3.4207254D | 02 |
| R 3.9341154D | 08 | DEC 2.7914102D | 01 | RA 7.9461623D | 01 |
| V 8.7452342D | 02 | PTH 8.4667975D | 01 | AZ 1.5591905D | 02 |
| ALT 3.8703805D | 08 | LTGD 2.7916676D | 01 | LON 3.1074459D | 02 |
| VE 2.5332102D | 04 | PTE 1.9698058D | 00 | AZE-9.0167994D | 01 |

FLIGHT TIME 2.6619839D 05

TIME 3 APRIL 1968 20 HRS., 1 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

| | | | | | |
|-----------------|----|-----------------|----|-----------------|----|
| XSC-1.7063265D | 07 | YSC-6.4876823D | 06 | ZSC-1.9465720D | 06 |
| DXSC 1.0793766D | 03 | DYSC 6.6218849D | 02 | DZSC 2.3602409D | 02 |
| RSC 1.8358490D | 07 | DESC-6.0865788D | 00 | RASC-1.5918252D | 02 |
| VSC 1.2881206D | 03 | PTSC-7.8499802D | 01 | AZSC-6.6412377D | 01 |

SELENOGRAPHIC REFERENCE

| | | | | | |
|-----------------|----|-----------------|----|-----------------|----|
| XSG 8.9361766D | 06 | YSG-1.6018108D | 07 | ZSG 7.7403887D | 05 |
| DXSG-8.8125990D | 02 | DYSG 9.5319534D | 02 | DZSG-3.8388906D | 01 |
| HSG 1.6620401D | 07 | LTSG 2.4164464D | 00 | LNSG-6.0843737D | 01 |
| VRSG 1.2987202D | 03 | PTSG-7.6391554D | 01 | AZSG-8.7215527D | 01 |
| LTS-1.5224050D | 01 | LNS 1.1156596D | 02 | LTE-5.9175830D | 00 |
| LNE-4.0718200D | 00 | DSMP 4.2246744D | 01 | RSMP 1.1547460D | 02 |
| LIN 1.7591185D | 02 | LAN-2.4655949D | 01 | LAP 1.5807172D | 02 |

GEOCENTRIC REFERENCE

| | | | | | |
|----------------|----|-----------------|----|----------------|----|
| X 6.3688854D | 07 | Y 3.4249257D | 08 | Z 1.8448253D | 08 |
| DX 1.2554557D | 02 | DY 7.9904091D | 02 | DZ 3.4230884D | 02 |
| R 3.9419695D | 08 | DEC 2.7904279D | 01 | RA 7.9465775D | 01 |
| V 8.7829574D | 02 | PTH 8.4827159D | 01 | AZ 1.6337712D | 02 |
| ALT 3.8782346D | 08 | LTGD 2.7906848D | 01 | LON 3.0698848D | 02 |
| VE 2.5395628D | 04 | PTE 1.9738597D | 00 | AZE-9.0171376D | 01 |

FLIGHT TIME 2.6709839D 05

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 20 HRS., 16 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-1.6086074D 07 YSC-5.8896091D 06 ZSC-1.7335377D 06
DXSC 1.0924481D 03 DYSC 6.6694185D 02 DZSC 2.3740459D 02
RSC 1.7217851D 07 DESC-5.7784776D 00 RASC-1.5989075D 02
VSC 1.3017738D 03 PTSC-7.7863328D 01 AZSC-6.6341852D 01
SELENOGRAPHIC REFERENCE
XSG 8.1422175D 06 YSG-1.5152964D 07 ZSG 7.3917566D 05
DXSG-8.8319018D 02 DYSG 9.6963309D 02 DZSG-3.9008660D 01
HSG 1.5479762D 07 LTSG 2.4605081D 00 LNSG-6.1749304D 01
VRSG 1.3121490D 03 PTSG-7.5910966D 01 AZSG-8.7192915D 01
LTS-1.5203889D-01 LNS 1.1143884D 02 LTE-5.9250263D 00
LNE-4.0848826D 00 DSMP 4.2152819D-01 RSMP 1.1536093D 02
LIN 1.7591396D 02 LAN-2.4770144D 01 LAP 1.5811585D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.6799839D 05
X 6.3807405D 07 Y 3.4321294D 08 Z 1.8479076D 08
DX 1.3818925D 02 DY 8.0186079D 02 DZ 3.4265596D 02
R 3.9498624D 08 DEC 2.7894241D 01 RA 7.9468261D 01
V 8.8288737D 02 PTH 8.4897004D 01 AZ 1.7216669D 02
ALT 3.8861275D 08 LTGD 2.7896803D 01 LON 3.0323070D 02
VE 2.5460931D 04 PTE 1.9793086D 00 AZE-9.0175258D 01

TIME 3 APRIL 1968 20 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-1.5096280D 07 YSC-5.2870350D 06 ZSC-1.5192078D 06
DXSC 1.1074519D 03 DYSC 6.7220200D 02 DZSC 2.3890462D 02
RSC 1.6067308D 07 DESC-5.4255768D 00 RASC-1.6069866D 02
VSC 1.3173384D 03 PTSC-7.7141630D 01 AZSC-6.6265261D 01
SELENOGRAPHIC REFERENCE
XSG 7.3462361D 06 YSG-1.4272210D 07 ZSG 7.0371546D 05
DXSG-8.8577124D 02 DYSG 9.8795241D 02 DZSG-3.9724496D 01
HSG 1.4329219D 07 LTSG 2.5102416D 00 LNSG-6.2764071D 01
VRSG 1.3274859D 03 PTSG-7.5345903D 01 AZSG-8.7176765D 01
LTS-1.5183723D-01 LNS 1.1131171D 02 LTE-5.9324427D 00
LNE-4.0979309D 00 DSMP 4.2058889D-01 RSMP 1.1524725D 02
LIN 1.7591573D 02 LAN-2.4887302D 01 LAP 1.5815436D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.6889839D 05
X 6.3938175D 07 Y 3.4393607D 08 Z 1.8509935D 08
DX 1.5276984D 02 DY 8.0518648D 02 DZ 3.4312191D 02
R 3.9578009D 08 DEC 2.7883954D 01 RA 7.9468852D 01
V 8.8847991D 02 PTH 8.4830116D 01 AZ-1.7782913D 02
ALT 3.8940659D 08 LTGD 2.7886511D 01 LON 2.9947102D 02
VE 2.5528408D 04 PTE 1.9863756D 00 AZE-9.0179749D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 20 HRS., 46 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-1.4091937D 07 YSC-4.6794717D 06 ZSC-1.3034719D 06
DXSC 1.1248728D 03 DYSC 6.7804193D 02 DZSC 2.4052957D 02
RSC 1.4905676D 07 DESC-5.0168103D 00 RASC-1.6163035D 02
VSC 1.3352656D 03 PTSC-7.6315330D 01 AZSC-6.6182382D 01

SELENOGRAPHIC REFERENCE

XSG 6.5475980D 06 YSG-1.3373949D 07 ZSG 6.6756045D 05
DXSG-8.8911425D 02 DYSG 1.0086323D 03 DZSG-4.0563058D 01
HSG 1.3167586D 07 LTSG 2.5668874D 00 LNSG-6.3914619D 01
VRSG 1.3451798D 03 PTSG-7.4677015D 01 AZSG-8.7168893D 01
LTS-1.5163549D-01 LNS 1.1118459D 02 LTE-5.9398321D 00
LNE-4.1109650D 00 DSMP 4.1964955D-01 RSMP 1.1513355D 02
LIN 1.7591719D 02 LAN-2.5007258D 01 LAP 1.5818756D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.6979839D 05
X 6.4083115D 07 Y 3.4466245D 08 Z 1.8540841D 08
DX 1.6977224D 02 DY 8.0909097D 02 DZ 3.4371209D 02
R 3.9657928D 08 DEC 2.7873379D 01 RA 7.9467260D 01
V 8.9531493D 02 PTH 8.4569822D 01 AZ-1.6703270D 02
ALT 3.9020579D 08 LTGD 2.7875930D 01 LON 2.9570916D 02
VE 2.5598585D 04 PTE 1.9953317D 00 AZE-9.0184997D 01

TIME 3 APRIL 1968 21 HRS., 1 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-1.3070587D 07 YSC-4.0663612D 06 ZSC-1.0862173D 06
DXSC 1.1453763D 03 DYSC 6.8454316D 02 DZSC 2.4227850D 02
RSC 1.3731547D 07 DESC-4.5370524D 00 RASC-1.6271867D 02
VSC 1.3561656D 03 PTSC-7.5358345D 01 AZSC-6.6093315D 01

SELENOGRAPHIC REFERENCE

XSG 5.7455594D 06 YSG-1.2455774D 07 ZSG 6.3058443D 05
DXSG-8.9335210D 02 DYSG 1.0323317D 03 DZSG-4.1561673D 01
HSG 1.1993458D 07 LTSG 2.6320803D 00 LNSG-6.5237217D 01
VRSG 1.3658383D 03 PTSG-7.3878236D 01 AZSG-8.7171732D 01
LTS-1.5143369D-01 LNS 1.1105747D 02 LTE-5.9471945D 00
LNE-4.1239846D 00 DSMP 4.1871017D-01 RSMP 1.1501985D 02
LIN 1.7591836D 02 LAN-2.5129844D 01 LAP 1.5821575D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7069839D 05
X 6.4244688D 07 Y 3.4539263D 08 Z 1.8571807D 08
DX 1.8986175D 02 DY 8.1365578D 02 DZ 3.4442557D 02
R 3.9738476D 08 DEC 2.7862463D 01 RA 7.9463122D 01
V 9.0372130D 02 PTH 8.4056153D 01 AZ-1.5613098D 02
ALT 3.9101126D 08 LTGD 2.7865009D 01 LON 2.9194476D 02
VE 2.5672172D 04 PTE 2.0065053D 00 AZE-9.0191201D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPURTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 21 HRS., 4 MIN., 49.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-1.2812239D 07 YSC-3.9121443D 06 ZSC-1.0316535D 06
 DXSC 1.1510859D 03 DYSC 6.3628181D 02 DZSC 2.4273384D 02
 KSC 1.3435872D 07 DESC-4.4037056D 00 RASC-1.6302024D 02
 VSC 1.3619476D 03 PTSC-7.5094736D 01 AZSC-6.6070152D 01
 SELENOGRAPHIC REFERENCE
 XSG 5.5444192D 06 YSG-1.2222774D 07 ZSG 6.2119372D 05
 DXSG-8.9456912D 02 DYSG 1.0388298D 03 DZSG-4.1842171D 01
 HSG 1.1697783D 07 LTSG 2.6499559D 00 LNSG-6.5600295D 01
 VRSG 1.3715582D 03 PTSG-7.3654304D 01 AZSG-8.7174484D 01
 LTS-1.5138323D-01 LNS 1.1102569D 02 LTE-5.9490308D 00
 LNE-4.1272373D 00 DSMP 4.1847532D-01 RSMP 1.1499143D 02
 LIN 1.7591861D 02 LAN-2.5160881D 01 LAP 1.5822205D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7092339D 05
 X 6.4288033D 07 Y 3.4557584D 08 Z 1.8579558D 08
 DX 1.9546865D 02 DY 8.1491017D 02 DZ 3.4462194D 02
 R 3.9758724D 08 DEC 2.7859674D 01 RA 7.9461637D 01
 V 9.0611857D 02 PTH 8.3881221D 01 AZ-1.5347714D 02
 ALT 3.9121374D 08 LTGD 2.7862218D 01 LON 2.9100321D 02
 VE 2.5691211D 04 PTE 2.0096899D 00 AZE-9.0192931D 01

TIME 3 APRIL 1968 21 HRS., 8 MIN., 34.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-1.2552578D 07 YSC-3.7575308D 06 ZSC-9.7698655D 05
 DXSC 1.1570631D 03 DYSC 6.8806842D 02 DZSC 2.4319569D 02
 RSC 1.3139283D 07 DESC-4.2642292D 00 RASC-1.6333527D 02
 VSC 1.3679829D 03 PTSC-7.4820090D 01 AZSC-6.6046668D 01
 SELENOGRAPHIC REFERENCE
 XSG 5.3429975D 06 YSG-1.1988282D 07 ZSG 6.1173846D 05
 DXSG-8.9585432D 02 DYSG 1.0455908D 03 DZSG-4.2136973D 01
 HSG 1.1401193D 07 LTSG 2.6685403D 00 LNSG-6.5978180D 01
 VRSG 1.3775306D 03 PTSG-7.3419384D 01 AZSG-8.7178174D 01
 LTS-1.5133277D-01 LNS 1.1099391D 02 LTE-5.9508655D 00
 LNE-4.1304890D 00 DSMP 4.1824046D-01 RSMP 1.1496300D 02
 LIN 1.7591885D 02 LAN-2.5192069D 01 LAP 1.5822806D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7114839D 05
 X 6.4332669D 07 Y 3.4575934D 08 Z 1.8587315D 08
 DX 2.0134329D 02 DY 8.1621247D 02 DZ 3.4482478D 02
 R 3.9779020D 08 DEC 2.7856859D 01 RA 7.9459955D 01
 V 9.0865067D 02 PTH 8.3685855D 01 AZ-1.5087283D 02
 ALT 3.9141670D 08 LTGD 2.7859401D 01 LON 2.9006146D 02
 VE 2.5710542D 04 PTE 2.0130441D 00 AZE-9.0194743D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 21 HRS., 12 MIN., 19.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-1.2291540D 07 YSC-3.6025098D 06 ZSC-9.2221500D 05
 DXSC 1.1633276D 03 DYSC 6.8990422D 02 DZSC 2.4366348D 02
 RSC 1.2841748D 07 DESC-4.1181735D 00 RASC-1.6366473D 02
 VSC 1.3742892D 03 PTSC-7.4533653D 01 AZSC-6.6022894D 01

SELENOGRAPHIC REFERENCE

XSG 5.1412788D 06 YSG-1.1752238D 07 ZSG 6.0221531D 05
 DXSG-8.9721039D 02 DYSG 1.0526346D 03 DZSG-4.2447249D 01
 HSG 1.1103659D 07 LTSG 2.6878780D 00 LNSG-6.6371949D 01
 VRSG 1.3837731D 03 PTSG-7.3172723D 01 AZSG-8.7182873D 01
 LTS-1.5128230D-01 LNS 1.1096213D 02 LTE-5.9526985D 00
 LNE-4.1337399D 00 DSMP 4.1800560D-01 RSMP 1.1493457D 02
 LIN 1.7591907D 02 LAN-2.5223405D 01 LAP 1.5823379D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7137339D 05
 X 6.4378659D 07 Y 3.4594314D 08 Z 1.8595076D 08
 DX 2.0750561D 02 DY 8.1756389D 02 DZ 3.4503351D 02
 R 3.9799366D 08 DEC 2.7854016D 01 RA 7.9458067D 01
 V 9.1132729D 02 PTH 8.3469117D 01 AZ-1.4832664D 02
 ALT 3.9162016D 08 LTGD 2.7856557D 01 LON 2.8911951D 02
 VE 2.5730186D 04 PTE 2.0165751D 00 AZE-9.0196642D 01

TIME 3 APRIL 1968 21 HRS., 16 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-1.2029057D 07 YSC-3.4470701D 06 ZSC-8.6733760D 05
 DXSC 1.1699015D 03 DYSC 6.9179035D 02 DZSC 2.4413647D 02
 RSC 1.2543237D 07 DESC-3.9650427D 00 RASC-1.6400970D 02
 VSC 1.3808859D 03 PTSC-7.4234598D 01 AZSC-6.5998868D 01

SELENOGRAPHIC REFERENCE

XSG 4.9392467D 06 YSG-1.1514575D 07 ZSG 5.9262064D 05
 DXSG-8.9864006D 02 DYSG 1.0599833D 03 DZSG-4.2774297D 01
 HSG 1.0805147D 07 LTSG 2.7080176D 00 LNSG-6.6782789D 01
 VRSG 1.3903050D 03 PTSG-7.2913492D 01 AZSG-8.7188661D 01
 LTS-1.5123183D-01 LNS 1.1093034D 02 LTE-5.9545298D 00
 LNE-4.1369898D 00 DSMP 4.1777074D-01 RSMP 1.1490614D 02
 LIN 1.7591927D 02 LAN-2.5254886D 01 LAP 1.5823924D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7159839D 05
 X 6.4426070D 07 Y 3.4612725D 08 Z 1.8602841D 08
 DX 2.1397761D 02 DY 8.1896559D 02 DZ 3.4524741D 02
 R 3.9819764D 08 DEC 2.7851144D 01 RA 7.9455964D 01
 V 9.1415908D 02 PTH 8.3230035D 01 AZ-1.4584584D 02
 ALT 3.9182414D 08 LTGD 2.7853683D 01 LON 2.8817733D 02
 VE 2.5750167D 04 PTE 2.0202899D 00 AZE-9.0198635D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 21 HRS., 19 MIN., 49.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-1.1765059D 07 YSC-3.2912003D 06 ZSC-8.1235327D 05
DXSC 1.1768091D 03 DYSC 6.9372782D 02 DZSC 2.4461375D 02
RSC 1.2243714D 07 DESC-3.8042892D 00 RASC-1.6437137D 02
VSC 1.3877946D 03 PTSC-7.3922016D 01 AZSC-6.5974636D 01
SELENOGRAPHIC REFERENCE
XSG 4.7368845D 06 YSG-1.1275221D 07 ZSG 5.8295052D 05
DXSG-9.0014608D 02 DYSG 1.0676609D 03 DZSG-4.3119567D 01
HSG 1.0505624D 07 LTSG 2.7290115D 00 LNSG-6.7212012D 01
VRSG 1.3971479D 03 PTSG-7.2640783D 01 AZSG-8.7195623D 01
LTS-1.5118135D-01 LNS 1.1089856D 02 LTE-5.9563594D 00
LNE-4.1402388D 00 DSMP 4.1753588D-01 RSMP 1.1487771D 02
LIN 1.7591947D 02 LAN-2.5286509D 01 LAP 1.5824441D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7182339D 05
X 6.4474974D 07 Y 3.4631168D 08 Z 1.8610612D 08
DX 2.2078365D 02 DY 8.2041856D 02 DZ 3.4546555D 02
R 3.9840217D 08 DEC 2.7848241D 01 RA 7.9453633D 01
V 9.1715782D 02 PTH 8.2967585D 01 AZ-1.4343636D 02
ALT 3.9202867D 08 LTGD 2.7850779D 01 LON 2.8723494D 02
VE 2.5770511D 04 PTE 2.0241961D 00 AZE-9.0200729D 01

TIME 3 APRIL 1968 21 HRS., 23 MIN., 34.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-1.1499466D 07 YSC-3.1348887D 06 ZSC-7.5726117D 05
DXSC 1.1840775D 03 DYSC 6.9571742D 02 DZSC 2.4509416D 02
RSC 1.1943144D 07 DESC-3.6353066D 00 RASC-1.6475104D 02
VSC 1.3950388D 03 PTSC-7.3594904D 01 AZSC-6.5950256D 01
SELENOGRAPHIC REFERENCE
XSG 4.5341745D 06 YSG-1.1034101D 07 ZSG 5.7320067D 05
DXSG-9.0173120D 02 DYSG 1.0756946D 03 DZSG-4.3484675D 01
HSG 1.0205055D 07 LTSG 2.7509170D 00 LNSG-6.7661071D 01
VRSG 1.4043251D 03 PTSG-7.2353591D 01 AZSG-8.7203857D 01
LTS-1.5113087D-01 LNS 1.1086678D 02 LTE-5.9581873D 00
LNE-4.1434869D 00 DSMP 4.1730101D-01 RSMP 1.1484928D 02
LIN 1.7591964D 02 LAN-2.5318272D 01 LAP 1.5824931D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7204839D 05
X 6.4525450D 07 Y 3.4649644D 08 Z 1.8618387D 08
DX 2.2795072D 02 DY 8.2192360D 02 DZ 3.4568677D 02
R 3.9860727D 08 DEC 2.7845306D 01 RA 7.9451064D 01
V 9.2033650D 02 PTH 8.2680670D 01 AZ-1.4110278D 02
ALT 3.9223376D 08 LTGD 2.7847843D 01 LON 2.8629230D 02
VE 2.5791244D 04 PTE 2.0283011D 00 AZE-9.0202932D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 21 HRS., 27 MIN., 19.935 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.1232195D 07 | YSC-2.9781235D 06 | ZSC-7.0206077D 05 |
| DXSC 1.1917366D 03 | DYSC 6.9775972D 02 | DZSC 2.4557625D 02 |
| RSC 1.1641491D 07 | DESC-3.4574214D 00 | RASC-1.6515018D 02 |
| VSC 1.4026448D 03 | PTSC-7.3252153D 01 | AZSC-6.5925804D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG 4.3310987D 06 | YSG-1.0791131D 07 | ZSG 5.6336643D 05 |
| DXSG-9.0339807D 02 | DYSG 1.0841143D 03 | DZSG-4.3871436D 01 |
| HSG 9.9034011D 06 | LTSG 2.7737967D 00 | LNSG-6.8131579D 01 |
| VRSG 1.4118628D 03 | PTSG-7.2050806D 01 | AZSG-8.7213470D 01 |
| LTS-1.5108038D-01 | LNS 1.1083500D 02 | LTE-5.9600135D 00 |
| LNE-4.1467341D 00 | DSMP 4.1706614D-01 | RSMP 1.1482085D 02 |
| LIN 1.7591981D 02 | LAN-2.5350172D 01 | LAP 1.5825395D 02 |

GEOCENTRIC REFERENCE

| | | |
|-------------------|--------------------|-------------------|
| X 6.4577581D 07 | Y 3.4668155D 08 | Z 1.8626168D 08 |
| DX 2.3550884D 02 | DY 8.2348129D 02 | DZ 3.4590964D 02 |
| R 3.9881295D 08 | DEC 2.7842338D 01 | RA 7.9448243D 01 |
| V 9.2370955D 02 | PTH 8.2368099D 01 | AZ-1.3884839D 02 |
| ALT 3.9243945D 08 | LTGD 2.7844873D 01 | LON 2.8534941D 02 |
| VE 2.5812399D 04 | PTE 2.0326125D 00 | AZE-9.0205252D 01 |

FLIGHT TIME 2.7227339D 05

TIME 3 APRIL 1968 21 HRS., 31 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.0963153D 07 | YSC-2.8208928D 06 | ZSC-6.4675187D 05 |
| DXSC 1.1998200D 03 | DYSC 6.9985494D 02 | DZSC 2.4605825D 02 |
| RSC 1.1338714D 07 | DESC-3.2698833D 00 | RASC-1.6557041D 02 |
| VSC 1.4106416D 03 | PTSC-7.2892533D 01 | AZSC-6.5901367D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG 4.1276385D 06 | YSG-1.0546219D 07 | ZSG 5.5344269D 05 |
| DXSG-9.0514923D 02 | DYSG 1.0929536D 03 | DZSG-4.4281890D 01 |
| HSG 9.6006248D 06 | LTSG 2.7977187D 00 | LNSG-6.8625337D 01 |
| VRSG 1.4197900D 03 | PTSG-7.1731197D 01 | AZSG-8.7224580D 01 |
| LTS-1.5102989D-01 | LNS 1.1080322D 02 | LTE-5.9618381D 00 |
| LNE-4.1499804D 00 | DSMP 4.1683127D-01 | RSMP 1.1479242D 02 |
| LIN 1.7591996D 02 | LAN-2.5382205D 01 | LAP 1.5825833D 02 |

GEOCENTRIC REFERENCE

| | | |
|-------------------|--------------------|-------------------|
| X 6.4631460D 07 | Y 3.4686701D 08 | Z 1.8633953D 08 |
| DX 2.4349150D 02 | DY 8.2509183D 02 | DZ 3.4613237D 02 |
| R 3.9901926D 08 | DEC 2.7839334D 01 | RA 7.9445157D 01 |
| V 9.2729297D 02 | PTH 8.2028559D 01 | AZ-1.3667527D 02 |
| ALT 3.9264575D 08 | LTGD 2.7841867D 01 | LON 2.8440626D 02 |
| VE 2.5834011D 04 | PTE 2.0371379D 00 | AZE-9.0207698D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 21 HRS., 34 MIN., 49.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-1.0692241D 07 YSC-2.6631848D 06 ZSC-5.9193473D 05
DXSC 1.2083652D 03 DYSC 7.0200283D 02 DZSC 2.4653792D 02
RSC 1.1034774D 07 DESC-3.0718543D 00 RASC-1.6601356D 02
VSC 1.4190614D 03 PTSC-7.2514675D 01 AZSC-6.5877060D 01
SELENOGRAPHIC REFERENCE
XSG 3.9237745D 06 YSG-1.0299268D 07 ZSG 5.4342389D 05
DXSG-9.0698703D 02 DYSG 1.1022499D 03 DZSG-4.4718339D 01
HSG 9.2966850D 06 LTSG 2.8227575D 00 LNSG-6.9144355D 01
VRSG 1.4281387D 03 PTSG-7.1393393D 01 AZSG-8.7237324D 01
LTS-1.5097939D-01 LNS 1.1077144D 02 LTE-5.9636609D 00
LNE-4.1532258D 00 DSMP 4.1659640D-01 RSMP 1.1476398D 02
LIN 1.7592010D 02 LAN-2.5414368D 01 LAP 1.5826246D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7272339D 05
X 6.4687187D 07 Y 3.4705284D 08 Z 1.8641744D 08
DX 2.5193618D 02 DY 8.2675498D 02 DZ 3.4635274D 02
R 3.9922621D 08 DEC 2.7836292D 01 RA 7.9441790D 01
V 9.3110465D 02 PTH 8.1660589D 01 AZ-1.3458444D 02
ALT 3.9285271D 08 LTGD 2.7838824D 01 LON 2.8346283D 02
VE 2.5856119D 04 PTE 2.0418845D 00 AZE-9.0210282D 01

TIME 3 APRIL 1968 21 HRS., 38 MIN., 34.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-1.0419351D 07 YSC-2.5049877D 06 ZSC-5.3581018D 05
DXSC 1.2174141D 03 DYSC 7.0420256D 02 DZSC 2.4701254D 02
RSC 1.0729628D 07 DESC-2.8623949D 00 RASC-1.6648168D 02
VSC 1.4279403D 03 PTSC-7.2117053D 01 AZSC-6.5853019D 01
SELENOGRAPHIC REFERENCE
XSG 3.7194871D 06 YSG-1.0050170D 07 ZSG 5.3330388D 05
DXSG-9.0891346D 02 DYSG 1.1120454D 03 DZSG-4.5183391D 01
HSG 8.9915388D 06 LTSG 2.8489948D 00 LNSG-6.9690889D 01
VRSG 1.4369448D 03 PTSG-7.1035865D 01 AZSG-8.7251852D 01
LTS-1.5092889D-01 LNS 1.1073966D 02 LTE-5.9654820D 00
LNE-4.1564703D 00 DSMP 4.1636152D-01 RSMP 1.1473555D 02
LIN 1.7592023D 02 LAN-2.5446660D 01 LAP 1.5826633D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7294839D 05
X 6.4744870D 07 Y 3.4723906D 08 Z 1.8649539D 08
DX 2.6088494D 02 DY 8.2846992D 02 DZ 3.4656800D 02
R 3.9943384D 08 DEC 2.7833211D 01 RA 7.9438126D 01
V 9.3516455D 02 PTH 8.1262550D 01 AZ-1.3257595D 02
ALT 3.9306033D 08 LTGD 2.7835741D 01 LON 2.8251910D 02
VE 2.5878765D 04 PTE 2.0468590D 00 AZE-9.0213014D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 21 HRS., 42 MIN., 19.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-1.0144363D 07 YSC-2.3462899D 06 ZSC-4.8017972D 05
 DXSC 1.2270141D 03 DYSC 7.0645252D 02 DZSC 2.4747870D 02
 RSC 1.0423232D 07 DESC-2.6404489D 00 RASC-1.6697705D 02
 VSC 1.4373185D 03 PTSC-7.1697955D 01 AZSC-6.5829415D 01

SELENOGRAPHIC REFERENCE

XSG 3.5147561D 06 YSG-9.7988079D 06 ZSG 5.2307590D 05
 DXSG-9.1093006D 02 DYSG 1.1223878D 03 DZSG-4.5680013D 01
 HSG 8.6851421D 06 LTSG 2.8765199D 00 LNSG-7.0267481D 01
 VRSG 1.4462485D 03 PTSG-7.0656899D 01 AZSG-8.7268336D 01
 LTS-1.5087839D-01 LNS 1.1070788D 02 LTE-5.9673014D 00
 LNE-4.1597138D 00 DSMP 4.1612664D-01 RSMP 1.1470712D 02
 LIN 1.7592034D 02 LAN-2.5479076D 01 LAP 1.5826997D 02

GEUCENTRIC REFERENCE

FLIGHT TIME 2.7317339D 05
 X 6.4804627D 07 Y 3.4742566D 08 Z 1.8657339D 08
 DX 2.7038515D 02 DY 8.3023502D 02 DZ 3.4677477D 02
 R 3.9964216D 08 DEC 2.7830088D 01 RA 7.9434148D 01
 V 9.3949511D 02 PTH 8.0832588D 01 AZ-1.3064904D 02
 ALT 3.9326865D 08 LTGD 2.7832617D 01 LON 2.8157505D 02
 VE 2.5902001D 04 PTE 2.0520678D 00 AZE-9.0215908D 01

TIME 3 APRIL 1968 21 HRS., 46 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

XSC-9.8671490D 06 YSC-2.1870805D 06 ZSC-4.2444571D 05
 DXSC 1.2372189D 03 DYSC 7.0875006D 02 DZSC 2.4793221D 02
 RSC 1.0115538D 07 DESC-2.4048240D 00 RASC-1.6750228D 02
 VSC 1.4472414D 03 PTSC-7.1255458D 01 AZSC-6.5806459D 01

SELENOGRAPHIC REFERENCE

XSG 3.3095612D 06 YSG-9.5450518D 06 ZSG 5.1273248D 05
 DXSG-9.1303769D 02 DYSG 1.1333309D 03 DZSG-4.6211589D 01
 HSG 8.3774483D 06 LTSG 2.9054313D 00 LNSG-7.0877001D 01
 VRSG 1.4560949D 03 PTSG-7.0254568D 01 AZSG-8.7286971D 01
 LTS-1.5082788D-01 LNS 1.1067610D 02 LTE-5.9691192D 00
 LNE-4.1629564D 00 DSMP 4.1589176D-01 RSMP 1.1467868D 02
 LIN 1.7592045D 02 LAN-2.5511613D 01 LAP 1.5827336D 02

GEUCENTRIC REFERENCE

FLIGHT TIME 2.7339839D 05
 X 6.4866588D 07 Y 3.4761267D 08 Z 1.8665144D 08
 DX 2.8049037D 02 DY 8.3204765D 02 DZ 3.4696885D 02
 R 3.9985122D 08 DEC 2.7826920D 01 RA 7.9429834D 01
 V 9.4412156D 02 PTH 8.0368595D 01 AZ-1.2880227D 02
 ALT 3.9347771D 08 LTGD 2.7829447D 01 LON 2.8063067D 02
 VE 2.5925880D 04 PTE 2.0575158D 00 AZE-9.0218979D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 21 HRS., 49 MIN., 49.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-9.5875650D 06 YSC-2.0273491D 06 ZSC-3.6861156D 05
 DXSC 1.2480892D 03 DYSC 7.1109123D 02 DZSC 2.4836788D 02
 RSC 9.8064988D 06 DESC-2.1541696D 00 RASC-1.6806033D 02
 VSC 1.4577599D 03 PTSC-7.0787392D 01 AZSC-6.5784411D 01
 SELENOGRAPHIC REFERENCE
 XSG 3.1038819D 06 YSG-9.2887602D 06 ZSG 5.0226533D 05
 DXSG-9.1523629D 02 DYSG 1.1449360D 03 DZSG-4.6782002D 01
 HSG 8.0684094D 06 LTSG 2.9358366D 00 LNSG-7.1522709D 01
 VRSG 1.4665348D 03 PTSG-6.9826699D 01 AZSG-8.7307979D 01
 LTS-1.5077737D-01 LNS 1.1064432D 02 LTE-5.9709352D 00
 LNE-4.1661981D 00 DSMP 4.1565687D-01 RSMP 1.1465025D 02
 LIN 1.7592054D 02 LAN-2.5544269D 01 LAP 1.5827653D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7362339D 05
 X 6.4930897D 07 Y 3.4780008D 08 Z 1.8672953D 08
 DX 2.9126137D 02 DY 8.3390384D 02 DZ 3.4714504D 02
 R 4.0006104D 08 DEC 2.7823704D 01 RA 7.9425164D 01
 V 9.4907244D 02 PTH 7.9868166D 01 AZ-1.2703366D 02
 ALT 3.9368753D 08 LTGD 2.7826230D 01 LON 2.7968594D 02
 VE 2.5950466D 04 PTE 2.0632064D 00 AZE-9.0222243D 01

TIME 3 APRIL 1968 21 HRS., 53 MIN., 34.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-9.3054538D 06 YSC-1.8670865D 06 ZSC-3.1268198D 05
 DXSC 1.2596943D 03 DYSC 7.1347032D 02 DZSC 2.4877925D 02
 RSC 9.4960651D 06 DESC-1.8869496D 00 RASC-1.6865457D 02
 VSC 1.4689318D 03 PTSC-7.0291297D 01 AZSC-6.5763595D 01
 SELENOGRAPHIC REFERENCE
 XSG 2.8976977D 06 YSG-9.0297766D 06 ZSG 4.9166521D 05
 DXSG-9.1752448D 02 DYSG 1.1572728D 03 DZSG-4.7395727D 01
 HSG 7.7579756D 06 LTSG 2.9678547D 00 LNSG-7.2208317D 01
 VRSG 1.4776258D 03 PTSG-6.9370827D 01 AZSG-8.7331614D 01
 LTS-1.5072685D-01 LNS 1.1061254D 02 LTE-5.9727496D 00
 LNE-4.1694389D 00 DSMP 4.1542199D-01 RSMP 1.1462181D 02
 LIN 1.7592063D 02 LAN-2.5577040D 01 LAP 1.5827947D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7384839D 05
 X 6.4997711D 07 Y 3.4798792D 08 Z 1.8680765D 08
 DX 3.0276741D 02 DY 8.3579790D 02 DZ 3.4729689D 02
 R 4.0027165D 08 DEC 2.7820438D 01 RA 7.9420114D 01
 V 9.5438010D 02 PTH 7.9328542D 01 AZ-1.2534079D 02
 ALT 3.9389814D 08 LTGD 2.7822962D 01 LON 2.7874082D 02
 VE 2.5975831D 04 PTE 2.0691411D 00 AZE-9.0225720D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 21 HRS., 57 MIN., 19.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-9.0206415D 06 YSC-1.7062852D 06 ZSC-2.5666332D 05
 DXSC 1.2721133D 03 DYSC 7.1587936D 02 DZSC 2.4915828D 02
 RSC 9.1841852D 06 DESC-1.6014092D 00 RASC-1.6928885D 02
 VSC 1.4808225D 03 PTSC-6.9764373D 01 AZSC-6.5744412D 01

SELENOGRAPHIC REFERENCE

XSG 2.6909889D 06 YSG-8.7679274D 06 ZSG 4.8092183D 05
 DXSG-9.1989917D 02 DYSG 1.1704216D 03 DZSG-4.8057941D 01
 HSG 7.4460957D 06 LTSG 3.0016161D 00 LNSG-7.2938077D 01
 VRSG 1.4894330D 03 PTSG-6.8884145D 01 AZSG-8.7358172D 01
 LTS-1.5067633D-01 LNS 1.1058076D 02 LTE-5.9745622D 00
 LNE-4.1726788D 00 DSMP 4.1518709D-01 RSMP 1.1459337D 02
 LIN 1.7592070D 02 LAN-2.5609923D 01 LAP 1.5828218D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7407339D 05
 X 6.5067204D 07 Y 3.4817620D 08 Z 1.8688581D 08
 DX 3.1508772D 02 DY 8.3772185D 02 DZ 3.4741636D 02
 R 4.0048309D 08 DEC 2.7817118D 01 RA 7.9414655D 01
 V 9.6008140D 02 PTH 7.8746551D 01 AZ-1.2372091D 02
 ALT 3.9410958D 08 LTGD 2.7819641D 01 LON 2.7779529D 02
 VE 2.6002056D 04 PTE 2.0753176D 00 AZE-9.0229429D 01

TIME 3 APRIL 1968 22 HRS., 1 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-8.7329350D 06 YSC-1.5449394D 06 ZSC-2.0056393D 05
 DXSC 1.2854374D 03 DYSC 7.1830739D 02 DZSC 2.4949493D 02
 RSC 8.8708070D 06 DESC-1.2955355D 00 RASC-1.6996762D 02
 VSC 1.4935068D 03 PTSC-6.9203418D 01 AZSC-6.5727365D 01

SELENOGRAPHIC REFERENCE

XSG 2.4837365D 06 YSG-8.5030199D 06 ZSG 4.7002361D 05
 DXSG-9.2235484D 02 DYSG 1.1844745D 03 DZSG-4.8774673D 01
 HSG 7.1327175D 06 LTSG 3.0372642D 00 LNSG-7.3716885D 01
 VRSG 1.5020311D 03 PTSG-6.8363446D 01 AZSG-8.7387994D 01
 LTS-1.5062581D-01 LNS 1.1054898D 02 LTE-5.9763731D 00
 LNE-4.1759177D 00 DSMP 4.1495220D-01 RSMP 1.1456494D 02
 LIN 1.7592077D 02 LAN-2.5642914D 01 LAP 1.5828468D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7429839D 05
 X 6.5139568D 07 Y 3.4836490D 08 Z 1.8696398D 08
 DX 3.2831339D 02 DY 8.3966473D 02 DZ 3.4749341D 02
 R 4.0069539D 08 DEC 2.7813740D 01 RA 7.9408760D 01
 V 9.6621851D 02 PTH 7.8118529D 01 AZ-1.2217103D 02
 ALT 3.9432188D 08 LTGD 2.7816262D 01 LON 2.7684933D 02
 VE 2.6029235D 04 PTE 2.0817298D 00 AZE-9.0233396D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 22 HRS., 4 MIN., 49.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-8.4421190D 06 YSC-1.3830465D 06 ZSC-1.4439471D 05
DXSC 1.2997717D 03 DYSC 7.2073953D 02 DZSC 2.4977662D 02
RSC 8.5558775D 06 DESC-9.6700777D-01 RASC-1.7069605D 02
VSC 1.5070701D 03 PTSC-6.8604751D 01 AZSC-6.5713084D 01
SELENOGRAPHIC REFERENCE
XSG 2.2759233D 06 YSG-8.2348388D 06 ZSG 4.5895750D 05
DXSG-9.2488271D 02 DYSG 1.1995384D 03 DZSG-4.9552976D 01
HSG 6.8177880D 06 LTSG 3.0749569D 00 LNSG-7.4550400D 01
VRSG 1.5155052D 03 PTSG-6.7805038D 01 AZSG-8.7421476D 01
LTS-1.5057528D-01 LNS 1.1051720D 02 LTE-5.9781824D 00
LNE-4.1791557D 00 DSMP 4.1471731D-01 RSMP 1.1453650D 02
LIN 1.7592083D 02 LAN-2.5676010D 01 LAP 1.5828697D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7452339D 05
X 6.5215020D 07 Y 3.4855404D 08 Z 1.8704217D 08
DX 3.4254964D 02 DY 8.4161166D 02 DZ 3.4751545D 02
R 4.0090859D 08 DEC 2.7810301D 01 RA 7.9402393D 01
V 9.7283988D 02 PTH 7.7440232D 01 AZ-1.2068799D 02
ALT 3.9453507D 08 LTGD 2.7812821D 01 LON 2.7590290D 02
VE 2.6057478D 04 PTE 2.0883651D 00 AZE-9.0237648D 01

TIME 3 APRIL 1968 22 HRS., 8 MIN., 34.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-8.1479528D 06 YSC-1.2206078D 06 ZSC-8.8169755D 04
DXSC 1.3152385D 03 DYSC 7.2315572D 02 DZSC 2.4998747D 02
RSC 8.2393441D 06 DESC-6.1313751D-01 RASC-1.7148013D 02
VSC 1.5216111D 03 PTSC-6.7964114D 01 AZSC-6.5702361D 01
SELENOGRAPHIC REFERENCE
XSG 2.0675344D 06 YSG-7.9631432D 06 ZSG 4.4770876D 05
DXSG-9.2746957D 02 DYSG 1.2157375D 03 DZSG-5.0401157D 01
HSG 6.5012546D 06 LTSG 3.1148670D 00 LNSG-7.5445210D 01
VRSG 1.5299535D 03 PTSG-6.7204656D 01 AZSG-8.7459088D 01
LTS-1.5052474D-01 LNS 1.1048542D 02 LTE-5.9799899D 00
LNE-4.1823928D 00 DSMP 4.1448241D-01 RSMP 1.1450806D 02
LIN 1.7592087D 02 LAN-2.5709207D 01 LAP 1.5828906D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7474839D 05
X 6.5293801D 07 Y 3.4874362D 08 Z 1.8712036D 08
DX 3.5791861D 02 DY 8.4354258D 02 DZ 3.4746662D 02
R 4.0112271D 08 DEC 2.7806795D 01 RA 7.9395519D 01
V 9.8000146D 02 PTH 7.6706720D 01 AZ-1.1926853D 02
ALT 3.9474919D 08 LTGD 2.7809313D 01 LON 2.7495596D 02
VE 2.6086910D 04 PTE 2.0952025D 00 AZE-9.0242217D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 22 HRS., 12 MIN., 19.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-7.8501661D 06 YSC-1.0576297D 06 ZSC-3.1907162D 04
 DXSC 1.3319803D 03 DYSC 7.2552898D 02 DZSC 2.5010737D 02
 RSC 7.9211556D 06 DESC-2.3079342D-01 RASC-1.7232690D 02
 VSC 1.5372435D 03 PTSC-6.7276560D 01 AZSC-6.5696204D 01

SELENOGRAPHIC REFERENCE

XSG 1.8585586D 06 YSG-7.6876617D 06 ZSG 4.3626059D 05
 DXSG-9.3009617D 02 DYSG 1.2332172D 03 DZSG-5.1329055D 01
 HSG 6.1830661D 06 LTSG 3.1571837D 00 LNSG-7.6409026D 01
 VRSG 1.5454897D 03 PTSG-6.6557338D 01 AZSG-8.7501380D 01
 LTS-1.5047421D-01 LNS 1.1045364D 02 LTE-5.9817958D 00
 LNE-4.1856290D 00 DSMP 4.1424751D-01 RSMP 1.1447962D 02
 LIN 1.7592092D 02 LAN-2.5742501D 01 LAP 1.5829095D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7497339D 05

X 6.5376179D 07 Y 3.4893364D 08 Z 1.8719853D 08
 DX 3.7456286D 02 DY 8.4543052D 02 DZ 3.4732679D 02
 R 4.0133778D 08 DEC 2.7803218D 01 RA 7.9388094D 01
 V 9.8776819D 02 PTH 7.5912222D 01 AZ-1.1790934D 02
 ALT 3.9496426D 08 LTGD 2.7805734D 01 LON 2.7400847D 02
 VE 2.6117678D 04 PTE 2.1022095D 00 AZE-9.0247138D 01

TIME 3 APRIL 1968 22 HRS., 16 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-7.5484536D 06 YSC-8.9412565D 05 ZSC 2.4369834D 04
 DXSC 1.3501645D 03 DYSC 7.2782310D 02 DZSC 2.5011067D 02
 RSC 7.6012634D 06 DESC 1.8369195D-01 RASC-1.7324470D 02
 VSC 1.5540997D 03 PTSC-6.6536295D 01 AZSC-6.5695896D 01

SELENOGRAPHIC REFERENCE

XSG 1.6489898D 06 YSG-7.4080873D 06 ZSG 4.2459377D 05
 DXSG-9.3273497D 02 DYSG 1.2521487D 03 DZSG-5.2348414D 01
 HSG 5.8631739D 06 LTSG 3.2021122D 00 LNSG-7.7450935D 01
 VRSG 1.5622456D 03 PTSG-6.5857277D 01 AZSG-8.7549011D 01
 LTS-1.5042366D-01 LNS 1.1042186D 02 LTE-5.9835999D 00
 LNE-4.1888642D 00 DSMP 4.1401260D-01 RSMP 1.1445118D 02
 LIN 1.7592095D 02 LAN-2.5775889D 01 LAP 1.5829265D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7519839D 05

X 6.5462462D 07 Y 3.4912406D 08 Z 1.8727665D 08
 DX 3.9264975D 02 DY 8.4723925D 02 DZ 3.4707032D 02
 R 4.0155384D 08 DEC 2.7799563D 01 RA 7.9380071D 01
 V 9.9621583D 02 PTH 7.5049959D 01 AZ-1.1660708D 02
 ALT 3.9518032D 08 LTGD 2.7802078D 01 LON 2.7306038D 02
 VE 2.6149955D 04 PTE 2.1093372D 00 AZE-9.0252455D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 22 HRS., 19 MIN., 49.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-7.2424691D 06 YSC-7.3011880D 05 ZSC 8.0631447D 04
DXSC 1.3699886D 03 DYSC 7.2998938D 02 DZSC 2.4996442D 02
RSC 7.2796246D 06 DESC 6.3403930D-01 RASC-1.7424341D 02
VSC 1.5723344D 03 PTSC-6.5736496D 01 AZSC-6.5703039D 01
SELENOGRAPHIC REFERENCE
XSG 1.4388294D 06 YSG-7.1240714D 00 ZSG 4.1268619D 05
DXSG-9.3534701D 02 DYSG 1.2727345D 03 DZSG-5.3473344D 01
HSG 5.5415351D 06 LTSG 3.2498735D 00 LNSG-7.8581722D 01
VRSG 1.5803755D 03 PTSG-6.5097631D 01 AZSG-8.7602769D 01
LTS-1.5037312D-01 LNS 1.1039008D 02 LTE-5.9854023D 00
LNE-4.1920985D 00 DSMP 4.1377769D-01 RSMP 1.1442274D 02
LIN 1.7592098D 02 LAN-2.5809366D 01 LAP 1.5829417D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7542339D 05
X 6.5552995D 07 Y 3.4931488D 08 Z 1.8735470D 08
DX 4.1237691D 02 DY 8.4892009D 02 DZ 3.4666427D 02
R 4.0177091D 08 DEC 2.7795825D 01 RA 7.9371395D 01
V 1.0054333D 03 PTH 7.4111923D 01 AZ-1.1535841D 02
ALT 3.9539739D 08 LTGD 2.7798338D 01 LON 2.7211163D 02
VE 2.6183946D 04 PTE 2.1165145D 00 AZE-9.0258215D 01

TIME 3 APRIL 1968 22 HRS., 23 MIN., 34.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-6.9318182D 06 YSC-5.6564489D 05 ZSC 1.3683944D 05
DXSC 1.3916876D 03 DYSC 7.3196215D 02 DZSC 2.4962597D 02
RSC 6.9562046D 06 DESC 1.1271704D 00 RASC-1.7533492D 02
VSC 1.5921294D 03 PTSC-6.4869058D 01 AZSC-6.5719923D 01
SELENOGRAPHIC REFERENCE
XSG 1.2280893D 06 YSG-6.3352153D 06 ZSG 4.0051223D 05
DXSG-9.3787753D 02 DYSG 1.2952164D 03 DZSG-5.4720939D 01
HSG 5.2181151D 06 LTSG 3.3007018D 00 LNSG-7.9814287D 01
VRSG 1.6000607D 03 PTSG-6.4270274D 01 AZSG-8.7663608D 01
LTS-1.5032256D-01 LNS 1.1035830D 02 LTE-5.9872031D 00
LNE-4.1953319D 00 DSMP 4.1354279D-01 RSMP 1.1439430D 02
LIN 1.7592100D 02 LAN-2.5842927D 01 LAP 1.5829551D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7564839D 05
X 6.5648172D 07 Y 3.4950606D 08 Z 1.8743263D 08
DX 4.3397918D 02 DY 8.5040736D 02 DZ 3.4606597D 02
R 4.0198901D 08 DEC 2.7791996D 01 RA 7.9362005D 01
V 1.0155256D 03 PTH 7.3088600D 01 AZ-1.1416005D 02
ALT 3.9561549D 08 LTGD 2.7794508D 01 LON 2.7116218D 02
VE 2.6219894D 04 PTE 2.1236390D 00 AZE-9.0264477D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 22 HRS., 27 MIN., 19.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-6.61604820 06 YSC-4.00756950 05 ZSC 1.92944590 05
 DXSC 1.41554220 03 DYSC 7.33652390 02 DZSC 2.49039620 02
 RSC 6.63098240 06 DESC 1.66739550 00 RASC-1.76533620 02
 VSC 1.61369960 03 PTSC-6.39242840 01 AZSC-6.57491980 01

SELENOGRAPHIC REFERENCE

XSG 1.01679600 06 YSG-6.54106080 06 ZSG 3.88042030 05
 DXSG-9.40249650 02 DYSG 1.31988460 03 DZSG-5.61120800 01
 HSG 4.89289290 06 LTSG 3.35483910 00 LNSG-8.11641880 01
 VRSG 1.62151570 03 PTSG-6.33654830 01 AZSG-8.77326890 01
 LTS-1.50272010-01 LNS 1.10326520 02 LTE-5.98900210 00
 LNE-4.19856440 00 DSMP 4.13307870-01 RSMP 1.14365860 02
 LIN 1.75921020 02 LAN-2.58765670 01 LAP 1.58296690 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.75873390 05
 X 6.57484470 07 Y 3.49697550 08 Z 1.87510410 08
 DX 4.57737480 02 DY 8.51612040 02 DZ 3.45219720 02
 R 4.02208140 08 DEC 2.77880670 01 RA 7.93518280 01
 V 1.02661740 03 PTH 7.19686010 01 AZ-1.13008710 02
 ALT 3.95834610 08 LTGD 2.77905770 01 LON 2.70211930 02
 VE 2.62580910 04 PTE 2.13056450 00 AZE-9.02713060 01

TIME 3 APRIL 1968 22 HRS., 31 MIN., 4.935 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC-6.29463730 06 YSC-2.35531500 05 ZSC 2.48883230 05
 DXSC 1.44189090 03 DYSC 7.34938650 02 DZSC 2.48131880 02
 RSC 6.30395720 06 DESC 2.26265250 00 RASC-1.77857110 02
 VSC 1.63730070 03 PTSC-6.28904640 01 AZSC-6.57946200 01

SELENOGRAPHIC REFERENCE

XSG 9.04996480 05 YSG-6.24107780 06 ZSG 3.75240510 05
 DXSG-9.42355300 02 DYSG 1.34708980 03 DZSG-5.76725020 01
 HSG 4.56586770 06 LTSG 3.41252520 00 LNSG-8.26503600 01
 VRSG 1.64499560 03 PTSG-6.23715170 01 AZSG-8.78114440 01
 LTS-1.50221450-01 LNS 1.10294740 02 LTE-5.99079940 00
 LNE-4.20179590 00 DSMP 4.13072960-01 RSMP 1.14337410 02
 LIN 1.75921030 02 LAN-2.59102810 01 LAP 1.58297700 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.76098390 05
 X 6.58543410 07 Y 3.49889260 08 Z 1.87587960 08
 DX 4.83990070 02 DY 8.52412680 02 DZ 3.44052050 02
 R 4.02428290 08 DEC 2.77840300 01 RA 7.93407810 01
 V 1.03885780 03 PTH 7.07381930 01 AZ-1.11901150 02
 ALT 3.96054770 08 LTGD 2.77865390 01 LON 2.69260820 02
 VE 2.62988880 04 PTE 2.13708240 00 AZE-9.02787810 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 22 HRS., 34 MIN., 49.935 SEC., GMT
SELENUCENTRIC REFERENCE
XSC-5.9669797D 06 YSC-7.0077219D 04 ZSC 3.0457257D 05
DXSC 1.4711437D 03 DYSC 7.3565389D 02 DZSC 2.4680483D 02
RSC 5.9751587D 06 DESC 2.9218115D 00 RASC-1.7932713D 02
VSC 1.6632388D 03 PTSC-6.1753327D 01 AZSC-6.5861141D 01
SELENOGRAPHIC REFERENCE
XSG 5.9276700D 05 YSG-5.9346489D 06 ZSG 3.6206611D 05
DXSG-9.4404193D 02 DYSG 1.3772595D 03 DZSG-5.9434229D 01
HSG 4.2370692D 06 LTSG 3.4739788D 00 LNSG-8.4296073D 01
VRSG 1.6708056D 03 PTSG-6.1274063D 01 AZSG-8.7901651D 01
LTS-1.5017088D-01 LNS 1.1026296D 02 LTE-5.9925950D 00
LNE-4.2050265D 00 DSMP 4.1283804D-01 RSMP 1.1430897D 02
LIN 1.7592104D 02 LAN-2.5944063D 01 LAP 1.5829857D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7632339D 05
X 6.5966460D 07 Y 3.5008109D 08 Z 1.8766520D 08
DX 5.1314708D 02 DY 8.5264225D 02 DZ 3.4246502D 02
R 4.0264944D 08 DEC 2.7779873D 01 RA 7.9328766D 01
V 1.0524263D 03 PTH 6.9380670D 01 AZ-1.1083418D 02
ALT 3.9627591D 08 LTGD 2.7782380D 01 LON 2.6830874D 02
VE 2.6342713D 04 PTE 2.1428949D 00 AZE-9.0286993D 01

TIME 3 APRIL 1968 22 HRS., 38 MIN., 34.935 SEC., GMT
SELENUCENTRIC REFERENCE
XSC-5.6323676D 06 YSC 9.5452758D 04 ZSC 3.5990416D 05
DXSC 1.5038012D 03 DYSC 7.3556612D 02 DZSC 2.4492631D 02
RSC 5.6446618D 06 DESC 3.6556638D 00 RASC 1.7902908D 02
VSC 1.6918820D 03 PTSC-6.0495298D 01 AZSC-6.5955474D 01
SELENOGRAPHIC REFERENCE
XSG 3.8022475D 05 YSG-5.6210501D 06 ZSG 3.4846919D 05
DXSG-9.4509274D 02 DYSG 1.4109183D 03 DZSG-6.1437512D 01
HSG 3.9065723D 06 LTSG 3.5393647D 00 LNSG-8.6130231D 01
VRSG 1.6993132D 03 PTSG-6.0055498D 01 AZSG-8.8005544D 01
LTS-1.5012031D-01 LNS 1.1023118D 02 LTE-5.9943890D 00
LNE-4.2082561D 00 DSMP 4.1260312D-01 RSMP 1.1428053D 02
LIN 1.7592104D 02 LAN-2.5977904D 01 LAP 1.5829930D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7654839D 05
X 6.6085512D 07 Y 3.5027289D 08 Z 1.8774203D 08
DX 5.4570907D 02 DY 8.5206875D 02 DZ 3.4032649D 02
R 4.0287152D 08 DEC 2.7775585D 01 RA 7.9315670D 01
V 1.0675400D 03 PTH 6.7875521D 01 AZ-1.0980458D 02
ALT 3.9649799D 08 LTGD 2.7778090D 01 LON 2.6735557D 02
VE 2.6390092D 04 PTE 2.1475754D 00 AZE-9.0296052D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 22 HRS., 42 MIN., 19.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-5.2899681D 06 YSC 2.6084321D 05 ZSC 4.1473467D 05
DXSC 1.5404781D 03 DYSC 7.3434953D 02 DZSC 2.4231573D 02
RSC 5.3126082D 06 DESC 4.4774142D 00 RASC 1.7717708D 02
VSC 1.7236760D 03 PTSC-5.9094491D 01 AZSC-6.6086844D 01
SELENOGRAPHIC REFERENCE
XSG 1.6754562D 05 YSG-5.2994262D 06 ZSG 3.3438988D 05
DXSG-9.4519689D 02 DYSG 1.4487149D 03 DZSG-6.3733480D 01
HSG 3.5745187D 06 LTSG 3.6087361D 00 LNSG-8.8189146D 01
VRSG 1.7309633D 03 PTSG-5.8693876D 01 AZSG-8.8125954D 01
LTS-1.5006974D-01 LNS 1.1019940D 02 LTE-5.9961812D 00
LNE-4.2114848D 00 DSMP 4.1236820D-01 RSMP 1.1425208D 02
LIN 1.7592104D 02 LAN-2.6011796D 01 LAP 1.5829990D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7677339D 05
X 6.6212330D 07 Y 3.5046444D 08 Z 1.8781829D 08
DX 5.8229067D 02 DY 8.5036637D 02 DZ 3.3745585D 02
R 4.0309441D 08 DEC 2.7771150D 01 RA 7.9301355D 01
V 1.0844638D 03 PTH 6.6197301D 01 AZ-1.0880916D 02
ALT 3.9672088D 08 LTGD 2.7773654D 01 LON 2.6640119D 02
VE 2.6441672D 04 PTE 2.1505076D 00 AZE-9.0306084D 01

TIME 3 APRIL 1968 22 HRS., 46 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-4.9387945D 06 YSC 4.2579113D 05 ZSC 4.6887280D 05
DXSC 1.5819327D 03 DYSC 7.3154067D 02 DZSC 2.3872269D 02
RSC 4.9792400D 06 DESC 5.4032929D 00 RASC 1.7507250D 02
VSC 1.7591621D 03 PTSC-5.7523329D 01 AZSC-6.6268131D 01
SELENOGRAPHIC REFERENCE
XSG-4.5009867D 04 YSG-4.9687586D 06 ZSG 3.1975527D 05
DXSG-9.4390387D 02 DYSG 1.4914558D 03 DZSG-6.6387774D 01
HSG 3.2411505D 06 LTSG 3.6819358D 00 LNSG-9.0518999D 01
VRSG 1.7662962D 03 PTSG-5.7161542D 01 AZSG-8.8266519D 01
LTS-1.5001916D-01 LNS 1.1016762D 02 LTE-5.9979717D 00
LNE-4.2147126D 00 DSMP 4.1213327D-01 RSMP 1.1422364D 02
LIN 1.7592104D 02 LAN-2.6045728D 01 LAP 1.5830038D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7699839D 05
X 6.6347901D 07 Y 3.5065543D 08 Z 1.8789381D 08
DX 6.2365041D 02 DY 8.4707167D 02 DZ 3.3360271D 02
R 4.0331794D 08 DEC 2.7766553D 01 RA 7.9285660D 01
V 1.1035221D 03 PTH 6.4314095D 01 AZ-1.0784465D 02
ALT 3.9694441D 08 LTGD 2.7769055D 01 LON 2.6544543D 02
VE 2.6498260D 04 PTE 2.1507940D 00 AZE-9.0317237D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 22 HRS., 49 MIN., 49.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-4.5776702D 06 YSC 5.8986771D 05 ZSC 5.2206014D 05
DXSC 1.6291037D 03 DYSC 7.2647094D 02 DZSC 2.3379474D 02
RSC 4.6449494D 06 DESC 6.4532839D 00 RASC 1.7265745D 02
VSC 1.7989994D 03 PTSC-5.5746620D 01 AZSC-6.6517628D 01
SELENOGRAPHIC REFERENCE
XSG-2.5705779D 05 YSG-4.6278257D 06 ZSG 3.0447559D 05
DXSG-9.4055242D 02 DYSG 1.5401492D 03 DZSG-6.9485559D 01
HSG 2.9068599D 06 LTSG 3.7584225D 00 LNSG-9.3179286D 01
VRSG 1.8059698D 03 PTSG-5.5423211D 01 AZSG-8.8431949D 01
LTS-1.4996858D-01 LNS 1.1013584D 02 LTE-5.9997605D 00
LNE-4.2179394D 00 DSMP 4.1189834D-01 RSMP 1.1419519D 02
LIN 1.7592104D 02 LAN-2.6079686D 01 LAP 1.5830077D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7722339D 05
X 6.6493401D 07 Y 3.5084545D 08 Z 1.8796831D 08
DX 6.7072670D 02 DY 8.4151602D 02 DZ 3.2841463D 02
R 4.0354181D 08 DEC 2.7761773D 01 RA 7.9268390D 01
V 1.1251132D 03 PTH 6.2185396D 01 AZ-1.0690771D 02
ALT 3.9716827D 08 LTGD 2.7764274D 01 LON 2.6448810D 02
VE 2.6560864D 04 PTE 2.1471115D 00 AZE-9.0329684D 01

TIME 3 APRIL 1968 22 HRS., 53 MIN., 34.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-4.2051829D 06 YSC 7.5246119D 05 ZSC 5.7394306D 05
DXSC 1.6831496D 03 DYSC 7.1816083D 02 DZSC 2.2702773D 02
RSC 4.3103563D 06 DESC 7.6519129D 00 RASC 1.6985504D 02
VSC 1.8439873D 03 PTSC-5.3718868D 01 AZSC-6.6861809D 01
SELENOGRAPHIC REFERENCE
XSG-4.6803172D 05 YSG-4.2751516D 06 ZSG 2.8843907D 05
DXSG-9.3415803D 02 DYSG 1.5960562D 03 DZSG-7.3138385D 01
HSG 2.5722669D 06 LTSG 3.8369680D 00 LNSG-9.6247697D 01
VRSG 1.8507825D 03 PTSG-5.3433262D 01 AZSG-8.8628415D 01
LTS-1.4991799D-01 LNS 1.1010406D 02 LTE-6.0015475D 00
LNE-4.2211653D 00 DSMP 4.1166341D-01 RSMP 1.1416674D 02
LIN 1.7592103D 02 LAN-2.6113651D 01 LAP 1.5830109D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7744839D 05
X 6.6650243D 07 Y 3.5103387D 08 Z 1.8804146D 08
DX 7.2467825D 02 DY 8.3271995D 02 DZ 3.2138744D 02
R 4.0376556D 08 DEC 2.7756790D 01 RA 7.9249306D 01
V 1.1497265D 03 PTH 5.9759155D 01 AZ-1.0599485D 02
ALT 3.9739202D 08 LTGD 2.7759288D 01 LON 2.6352894D 02
VE 2.6630744D 04 PTE 2.1374850D 00 AZE-9.0343613D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 22 HRS., 57 MIN., 19.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-3.8196318D 06 YSC 9.1268952D 05 ZSC 6.2403056D 05
DXSC 1.7454859D 03 DYSC 7.0515234D 02 DZSC 2.1768859D 02
RSC 3.9764309D 06 DESC 9.0288816D 00 RASC 1.6656132D 02
VSC 1.8950855D 03 PTSC-5.1380481D 01 AZSC-6.7339755D 01

SELENOGRAPHIC REFERENCE

XSG-6.7709124D 05 YSG-3.9089430D 06 ZSG 2.7150505D 05
DXSG-9.2323245D 02 DYSG 1.6607448D 03 DZSG-7.7493377D 01
HSG 2.2383415D 06 LTSG 3.9151202D 00 LNSG-9.9827028D 01
VRSG 1.9016931D 03 PTSG-5.1131949D 01 AZSG-8.8864047D 01
LTS-1.4986740D-01 LNS 1.1007228D 02 LTE-6.0033329D 00
LNE-4.2243902D 00 DSMP 4.1142848D-01 RSMP 1.1413830D 02
LIN 1.7592103D 02 LAN-2.6147599D 01 LAP 1.5830135D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7767339D 05
X 6.6820127D 07 Y 3.5121982D 08 Z 1.8811275D 08
DX 7.8692055D 02 DY 8.1922545D 02 DZ 3.1178808D 02
R 4.0398849D 08 DEC 2.7751576D 01 RA 7.9228117D 01
V 1.1779584D 03 PTH 5.6967675D 01 AZ-1.0510237D 02
ALT 3.9761495D 08 LTGD 2.7754073D 01 LON 2.6256769D 02
VE 2.6709473D 04 PTE 2.1189234D 00 AZE-9.0359220D 01

TIME 3 APRIL 1968 23 HRS., 1 MIN., 4.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-3.4189670D 06 YSC 1.0692649D 06 ZSC 6.7163015D 05
DXSC 1.8177931D 03 DYSC 6.8524129D 02 DZSC 2.0469498D 02
RSC 3.6446879D 06 DESC 1.0618950D 01 RASC 1.6263318D 02
VSC 1.9534143D 03 PTSC-4.8652485D 01 AZSC-6.8010316D 01

SELENOGRAPHIC REFERENCE

XSG-8.8297848D 05 YSG-3.5270156D 06 ZSG 2.5349471D 05
DXSG-9.0549172D 02 DYSG 1.7361265D 03 DZSG-8.2744849D 01
HSG 1.9065984D 06 LTSG 3.9882460D 00 LNSG-1.0405496D 02
VRSG 1.9598207D 03 PTSG-4.8440099D 01 AZSG-8.9149577D 01
LTS-1.4981680D-01 LNS 1.1004050D 02 LTE-6.0051166D 00
LNE-4.2276142D 00 DSMP 4.1119354D-01 RSMP 1.1410985D 02
LIN 1.7592102D 02 LAN-2.6181494D 01 LAP 1.5830160D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7789839D 05
X 6.7005104D 07 Y 3.5140201D 08 Z 1.8818149D 08
DX 8.5913397D 02 DY 7.9882833D 02 DZ 2.9853421D 02
R 4.0420951D 08 DEC 2.7746102D 01 RA 7.9204466D 01
V 1.2105208D 03 PTH 5.3721941D 01 AZ-1.0422624D 02
ALT 3.9783598D 08 LTGD 2.7748597D 01 LON 2.6160397D 02
VE 2.6798975D 04 PTE 2.0868336D 00 AZE-9.0376676D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 23 HRS., 4 MIN., 49.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-3.0007372D 06 YSC 1.2202818D 06 ZSC 7.1574992D 05
 DXSC 1.9019327D 03 DYSC 6.5505273D 02 DZSC 1.8642970D 02
 RSC 3.3175005D 06 DESC 1.2459517D 01 RASC 1.5787035D 02
 VSC 2.0201975D 03 PTSC-4.5429364D 01 AZSC-6.8963742D 01
 SELENOGRAPHIC REFERENCE
 XSG-1.0837902D 06 YSG-3.1267185D 06 ZSG 2.3417900D 05
 DXSG-8.7733554D 02 DYSG 1.8244175D 03 DZSG-8.9146818D 01
 HSG 1.5794110D 06 LTSG 4.0478171D 00 LNSG-1.0911745D 02
 VRSG 2.0263888D 03 PTSG-4.5251941D 01 AZSG-8.9499022D 01
 LTS-1.4976620D-01 LNS 1.1000872D 02 LTE-6.0068986D 00
 LNE-4.2308373D 00 DSMP 4.1095860D-01 RSMP 1.1408140D 02
 LIN 1.7592102D 02 LAN-2.6215287D 01 LAP 1.5830188D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7812339D 05
 X 6.7207625D 07 Y 3.5157853D 08 Z 1.8824669D 08
 DX 9.4318010D 02 DY 7.6815363D 02 DZ 2.8000863D 02
 R 4.0442693D 08 DEC 2.7740337D 01 RA 7.9177915D 01
 V 1.2482201D 03 PTH 4.9904051D 01 AZ-1.0336205D 02
 ALT 3.9805340D 08 LTGD 2.7742830D 01 LON 2.6063735D 02
 VE 2.6901501D 04 PTE 2.0340776D 00 AZE-9.0396046D 01

TIME 3 APRIL 1968 23 HRS., 8 MIN., 34.935 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-2.5620791D 06 YSC 1.3628849D 06 ZSC 7.5494919D 05
 DXSC 1.9996162D 03 DYSC 6.0939118D 02 DZSC 1.6046818D 02
 RSC 2.9986085D 06 DESC 1.4582069D 01 RASC 1.5198947D 02
 VSC 2.0965621D 03 PTSC-4.1570132D 01 AZSC-7.0340096D 01
 SELENOGRAPHIC REFERENCE
 XSG-1.2766159D 06 YSG-2.7048888D 06 ZSG 2.1326421D 05
 DXSG-8.3336163D 02 DYSG 1.9278765D 03 DZSG-9.7019717D 01
 HSG 1.2605190D 06 LTSG 4.0783795D 00 LNSG-1.1526572D 02
 VRSG 2.1025252D 03 PTSG-4.1426169D 01 AZSG-8.9930038D 01
 LTS-1.4971559D-01 LNS 1.0997694D 02 LTE-6.0086788D 00
 LNE-4.2340594D 00 DSMP 4.1072366D-01 RSMP 1.1405295D 02
 LIN 1.7592101D 02 LAN-2.6248909D 01 LAP 1.5830226D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.7834839D 05
 X 6.7430554D 07 Y 3.5174652D 08 Z 1.8830692D 08
 DX 1.0407704D 03 DY 7.2200589D 02 DZ 2.6378677D 02
 R 4.0463810D 08 DEC 2.7734247D 01 RA 7.9147932D 01
 V 1.2918604D 03 PTH 4.5358020D 01 AZ-1.0250491D 02
 ALT 3.9826456D 08 LTGD 2.7736739D 01 LON 2.5966730D 02
 VE 2.7019397D 04 PTE 1.9495042D 00 AZE-9.0417119D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 23 HRS., 12 MIN., 19.935 SEC., GMT

SELENOCENTRIC REFERENCE

XSC-2.0998394D 06 YSC 1.4927636D 06 ZSC 7.8711874D 05
 DXSC 2.1114723D 03 DYSC 5.4035219D 02 DZSC 1.2323288D 02
 RSC 2.6939236D 06 DESC 1.6988694D 01 RASC 1.4459119D 02
 VSC 2.1829984D 03 PTSC-3.6889835D 01 AZSC-7.2355780D 01

SELENOGRAPHIC REFERENCE

XSG-1.4569750D 06 YSG-2.2579203D 06 ZSG 1.9037851D 05
 DXSG-7.6482262D 02 DYSG 2.0479660D 03 DZSG-1.0673025D 02
 HSG 9.5583415D 05 LTSG 4.0524476D 00 LNSG-1.2283305D 02
 VRSG 2.1887233D 03 PTSG-3.6777439D 01 AZSG-9.0462777D 01
 LTS-1.4966498D-01 LNS 1.0994516D 02 LTE-6.0104573D 00
 LNE-4.2372806D 00 DSMP 4.1048872D-01 RSMP 1.1402450D 02
 LIN 1.7592100D 02 LAN-2.6282270D 01 LAP 1.5830285D 02

GEOCENTRIC REFERENCE

X 6.7677043D 07 Y 3.5190169D 08 Z 1.8836006D 08
 DX 1.1525336D 03 DY 6.5248066D 02 DZ 2.1629108D 02
 R 4.0483884D 08 DEC 2.7727806D 01 RA 7.9113897D 01
 V 1.3419563D 03 PTH 3.9881511D 01 AZ-1.0164946D 02
 ALT 3.9846530D 08 LTGD 2.7730296D 01 LUN 2.5869320D 02
 VE 2.7154321D 04 PTE 1.8158714D 00 AZE-9.0439047D 01

FLIGHT TIME 2.7857339D 05

TIME 3 APRIL 1968 23 HRS., 16 MIN., 4.935 SEC., GMT

SELENOCENTRIC REFERENCE

XSC-1.6110363D 06 YSC 1.6034411D 06 ZSC 8.0918830D 05
 DXSC 2.2348172D 03 DYSC 4.3650107D 02 DZSC 6.9750762D 01
 RSC 2.4127261D 06 DESC 1.9595854D 01 RASC 1.3513537D 02
 VSC 2.2781146D 03 PTSC-3.1159891D 01 AZSC-7.5330565D 01

SELENOGRAPHIC REFERENCE

XSG-1.6180050D 06 YSG-1.7821500D 06 ZSG 1.6507057D 05
 DXSG-6.5905637D 02 DYSG 2.1832098D 03 DZSG-1.1858907D 02
 HSG 6.7463657D 05 LTSG 3.9230482D 00 LNSG-1.3223614D 02
 VRSG 2.2835989D 03 PTSG-3.1076725D 01 AZSG-9.1114178D 01
 LTS-1.4961437D-01 LNS 1.0991339D 02 LTE-6.0122342D 00
 LNE-4.2405008D 00 DSMP 4.1025377D-01 RSMP 1.1399605D 02
 LIN 1.7592097D 02 LAN-2.6315274D 01 LAP 1.5830388D 02

GEOCENTRIC REFERENCE

X 6.7950074D 07 Y 3.5203754D 08 Z 1.8840303D 08
 DX 1.2757859D 03 DY 5.4814324D 02 DZ 1.6254854D 02
 R 4.0502265D 08 DEC 2.7721007D 01 RA 7.9075150D 01
 V 1.3980389D 03 PTH 3.3227888D 01 AZ-1.0079016D 02
 ALT 3.9864910D 08 LTGD 2.7723496D 01 LON 2.5771439D 02
 VE 2.7305221D 04 PTE 1.6076997D 00 AZE-9.0459656D 01

FLIGHT TIME 2.7879839D 05

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 23 HRS., 19 MIN., 49.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-1.0940561D 06 YSC 1.6854997D 06 ZSC 8.1684678D 05
DXSC 2.3592313D 03 DYSC 2.8351100D 02 DZSC-5.8115666D 00
RSC 2.1691258D 06 DESC 2.2121925D 01 RASC 1.2298755D 02
VSC 2.3762122D 03 PTSC-2.4140945D 01 AZSC-7.9671381D 01

SELENOGRAPHIC REFERENCE

XSG-1.7495215D 06 YSG-1.2749718D 06 ZSG 1.3685066D 05
DXSG-4.9959181D 02 DYSG 2.3247004D 03 DZSG-1.3255366D 02
HSG 4.3103630D 05 LTSG 3.6172064D 00 LNSG-1.4391713D 02
VRSG 2.3814690D 03 PTSG-2.4084276D 01 AZSG-9.1881497D 01
LTS-1.4956375D-01 LNS 1.0988161D 02 LTE-6.0140093D 00
LNE-4.2437201D 00 DSMP 4.1001882D-01 RSMP 1.1396759D 02
LIN 1.7592092D 02 LAN-2.6347889D 01 LAP 1.5830576D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7902339D 05
X 5.8251262D 07 Y 3.5214466D 08 Z 1.8843154D 08
DX 1.4001077D 03 DY 3.9466682D 02 DZ 8.6725753D 01
R 4.0517964D 08 DEC 2.7713896D 01 RA 7.9031156D 01
V 1.4572525D 03 PTH 2.5144225D 01 AZ-9.9922199D 01
ALT 3.9880610D 08 LTGD 2.7716383D 01 LON 2.5673033D 02
VE 2.7464010D 04 PTE 1.2918388D 00 AZE-9.0474387D 01

TIME 3 APRIL 1968 23 HRS., 23 MIN., 34.935 SEC., GMT
SELENOCENTRIC REFERENCE

XSC-5.5106473D 05 YSC 1.7264318D 06 ZSC 8.0461132D 05
DXSC 2.4606769D 03 DYSC 6.9894354D 01 DZSC-1.0724809D 02
RSC 1.9828360D 06 DESC 2.3940524D 01 RASC 1.0770271D 02
VSC 2.4640045D 03 PTSC-1.5694399D 01 AZSC-8.5682423D 01

SELENOGRAPHIC REFERENCE

XSG-1.8376694D 06 YSG-7.3723453D 05 ZSG 1.0533196D 05
DXSG-2.7200884D 02 DYSG 2.4495998D 03 DZSG-1.4763026D 02
HSG 2.4474647D 05 LTSG 3.0450923D 00 LNSG-1.5814037D 02
VRSG 2.4690733D 03 PTSG-1.5661352D 01 AZSG-9.2709416D 01
LTS-1.4951313D-01 LNS 1.0984983D 02 LTE-6.0157827D 00
LNE-4.2469384D 00 DSMP 4.0978387D-01 RSMP 1.1393914D 02
LIN 1.7592083D 02 LAN-2.6380298D 01 LAP 1.5830923D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7924839D 05
X 6.8578440D 07 Y 3.5221055D 08 Z 1.8844010D 08
DX 1.5014612D 03 DY 1.8056375D 02 DZ-1.4971272D 01
R 4.0529612D 08 DEC 2.7706612D 01 RA 7.8981869D 01
V 1.5123535D 03 PTH 1.5494092D 01 AZ-9.9043491D 01
ALT 3.9892257D 08 LTGD 2.7709099D 01 LON 2.5574097D 02
VE 2.7609103D 04 PTE 8.3842805D-01 AZE-9.0475484D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 23 HRS., 27 MIN., 19.935 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 8.7131594D 03 YSC 1.7127584D 06 ZSC 7.6696131D 05
DXSC 2.5018155D 03 DYSC-1.9847217D 02 DZSC-2.2982180D 02
RSC 1.8766584D 06 DESC 2.4122226D 01 RASC 8.9708522D 01
VSC 2.5201766D 03 PTSC-6.0003908D 00 AZSC-9.3061105D 01
SELENOGRAPHIC REFERENCE
XSG-1.8669851D 06 YSG-1.7675008D 05 ZSG 7.0519289D 04
DXSG 2.0158102D 01 DYSG 2.5198951D 03 DZSG-1.6128974D 02
HSG 1.3856892D 05 LTSG 2.1535133D 00 LNSG-1.7459184D 02
VRSG 2.5251321D 03 PTSG-5.9885721D 00 AZSG-9.3458460D 01
LTS-1.4946250D-01 LNS 1.0981805D 02 LTE-6.0175544D 00
LNE-4.2501558D 00 DSMP 4.0954891D-01 RSMP 1.1391069D 02
LIN 1.7592070D 02 LAN-2.6412997D 01 LAP 1.5831475D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7947339D 05
X 6.8922384D 07 Y 3.5222172D 08 Z 1.8842318D 08
DX 1.5425081D 03 DY-8.8289237D 01 DZ-1.3780553D 02
R 4.0535630D 08 DEC 2.7699444D 01 RA 7.8928314D 01
V 1.5511662D 03 PTH 4.4924200D 00 AZ-9.8157608D 01
ALT 3.9898275D 08 LTGD 2.7701930D 01 LON 2.5474735D 02
VE 2.7703414D 04 PTE 2.5126250D-01 AZE-9.0453835D 01

PERISELENUM

TIME 3 APRIL 1968 23 HRS., 29 MIN., 31.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 3.3742265D 05 YSC 1.6755117D 06 ZSC 7.3176020D 05
DXSC 2.4844785D 03 DYSC-3.6734228D 02 DZSC-3.0451651D 02
RSC 1.8592112D 06 DESC 2.3177837D 01 RASC 7.8613790D 01
VSC 2.5298823D 03 PTSC-1.2932764D-12 AZSC-9.7523679D 01
SELENOGRAPHIC REFERENCE
XSG-1.8520491D 06 YSG 1.5554049D 05 ZSG 4.8863915D 04
DXSG 2.0729065D 02 DYSG 2.5207870D 03 DZSG-1.6723970D 02
HSG 1.2112174D 05 LTSG 1.5060249D 00 LNSG 1.7519939D 02
VRSG 2.5348187D 03 PTSG 2.8409589D-08 AZSG-9.8784255D 01
LTS-1.4943286D-01 LNS 1.0979945D 02 LTE-6.0185906D 00
LNE-4.2520385D 00 DSMP 4.0941139D-01 RSMP 1.1389403D 02
LIN 1.7592062D 02 LAN-2.6432482D 01 LAP 1.5831826D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7960509D 05
X 6.9124750D 07 Y 3.5219897D 08 Z 1.8840009D 08
DX 1.5251176D 03 DY-2.5744412D 02 DZ-2.1265276D 02
R 4.0536026D 08 DEC 2.7695465D 01 RA 7.8895913D 01
V 1.5612439D 03 PTH-2.2922006D 00 AZ-9.7639735D 01
ALT 3.9898671D 08 LTGD 2.7697950D 01 LON 2.5416470D 02
VE 2.7719729D 04 PTE-1.2908669D-01 AZE-9.0428666D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 23 HRS., 33 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 8.8651133D 05 YSC 1.5615446D 06 ZSC 6.4977043D 05
DXSC 2.3824476D 03 DYSC-6.3890445D 02 DZSC-4.2045589D 02
RSC 1.9095878D 06 DESC 1.9393164D 01 RASC 6.0415796D 01
VSC 2.5022068D 03 PTSC 1.0139645D 01 AZSC-1.0425558D 02
SELENOGRAPHIC REFERENCE
XSG-1.7701773D 06 YSG 7.1616104D 05 ZSG 1.0542156D 04
DXSG 5.1410804D 02 DYSG 2.4478680D 03 DZSG-1.7226941D 02
HSG 1.7149829D 05 LTSG 3.1631124D-01 LNSG 1.5797320D 02
VRSG 2.5071979D 03 PTSG 1.0119247D 01 AZSG-9.4058901D 01
LTS-1.4938223D-01 LNS 1.0976767D 02 LTE-6.0203596D 00
LNE-4.2552544D 00 DSMP 4.0917643D-01 RSMP 1.1386558D 02
LIN 1.7592053D 02 LAN-2.6466342D 01 LAP 1.5832322D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7983009D 05
X 6.9457972D 07 Y 3.5210967D 08 Z 1.8833874D 08
DX 1.4229955D 03 DY-5.2949285D 02 DZ-3.2885275D 02
R 4.0531113D 08 DEC 2.7689315D 01 RA 7.8840967D 01
V 1.5535195D 03 PTH-1.3738373D 01 AZ-9.6765249D 01
ALT 3.9893758D 08 LTGD 2.7691800D 01 LON 2.5316969D 02
VE 2.7672634D 04 PTE-7.6393051D-01 AZE-9.0368071D 01

TIME 3 APRIL 1968 23 HRS., 37 MIN., 1.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 1.4048447D 06 YSC 1.3924554D 06 ZSC 5.4481312D 05
DXSC 2.2184814D 03 DYSC-8.5241464D 02 DZSC-5.0689185D 02
RSC 2.0516681D 06 DESC 1.5399423D 01 RASC 4.4746236D 01
VSC 2.4300638D 03 PTSC 1.9369062D 01 AZSC-1.0903640D 02
SELENOGRAPHIC REFERENCE
XSG-1.6252041D 06 YSG 1.2519022D 06 ZSG-2.8185359D 04
DXSG 7.6225246D 02 DYSG 2.3064937D 03 DZSG-1.7109819D 02
HSG 3.1357859D 05 LTSG-7.8714138D-01 LNSG 1.4239277D 02
VRSG 2.4352036D 03 PTSG 1.9326555D 01 AZSG-9.3993571D 01
LTS-1.4933159D-01 LNS 1.0973589D 02 LTE-6.0221269D 00
LNE-4.2584693D 00 DSMP 4.0894146D-01 RSMP 1.1383712D 02
LIN 1.7592051D 02 LAN-2.6500480D 01 LAP-2.0167421D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8005509D 05
X 6.9760419D 07 Y 3.5196515D 08 Z 1.8825436D 08
DX 1.2589383D 03 DY-7.4348965D 02 DZ-4.1554936D 02
R 4.0519833D 08 DEC 2.7684212D 01 RA 7.8789118D 01
V 1.5199947D 03 PTH-2.4160846D 01 AZ-9.5912659D 01
ALT 3.9882477D 08 LTGD 2.7686697D 01 LON 2.5217778D 02
VE 2.7551837D 04 PTE-1.2938881D 00 AZE-9.0297107D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 23 HRS., 40 MIN., 40.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 1.8835433D 06 YSC 1.1832410D 06 ZSC 4.2410879D 05
DXSC 2.0367675D 03 DYSC-9.9632148D 02 DZSC-5.6113842D 02
RSC 2.2644343D 06 DESC 1.0794747D 01 RASC 3.2137016D 01
VSC 2.3357985D 03 PTSC 2.7221397D 01 AZSC-1.1190694D 02

SELENOGRAPHIC REFERENCE

XSG-1.4328438D 06 YSG 1.7522115D 06 ZSG-6.6152619D 04
DXSG 9.3562372D 02 DYSG 2.1396345D 03 DZSG-1.6595156D 02
HSG 5.2634485D 05 LTSG-1.6740627D 00 LNSG 1.2927404D 02
VRSG 2.3411466D 03 PTSG 2.7154090D 01 AZSG-9.3710118D 01

LTS-1.4928094D-01 LNS 1.0970411D 02 LTE-6.0238924D 00
LNE-4.2616833D 00 DSMP 4.0870650D-01 RSMP 1.1380867D 02
LIN 1.7592054D 02 LAN-2.6534472D 01 LAP-2.0167332D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8028009D 05
X 7.0023210D 07 Y 3.5178039D 08 Z 1.8815418D 08
DX 1.0771336D 03 DY-8.8788317D 02 DZ-4.7005661D 02
R 4.0503665D 08 DEC 2.7680208D 01 RA 7.8742203D 01
V 1.4729245D 03 PTH-3.3049632D 01 AZ-9.5084959D 01
ALT 3.9866309D 08 LTGD 2.7682694D 01 LON 2.5119079D 02
VE 2.7397236D 04 PTE-1.6801525D 00 AZE-9.0228864D 01

TIME 3 APRIL 1968 23 HRS., 44 MIN., 31.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 2.3223273D 06 YSC 9.4838155D 05 ZSC 2.9416176D 05
DXSC 1.8669023D 03 DYSC-1.0834095D 03 DZSC-5.9059236D 02
RSC 2.5257004D 06 DESC 6.6882693D 00 RASC 2.2213900D 01
VSC 2.2378337D 03 PTSC 3.3679384D 01 AZSC-1.1341964D 02

SELENOGRAPHIC REFERENCE

XSG-1.2089216D 06 YSG 2.2152010D 06 ZSG-1.0274150D 05
DXSG 1.0458731D 03 DYSG 1.9783161D 03 DZSG-1.5917200D 02
HSG 7.8761095D 05 LTSG-2.3313448D 00 LNSG 1.1862301D 02
VRSG 2.2434172D 03 PTSG 3.3584408D 01 AZSG-9.3336782D 01

LTS-1.4923029D-01 LNS 1.0967233D 02 LTE-6.0256562D 00
LNE-4.2648962D 00 DSMP 4.0847153D-01 RSMP 1.1378021D 02
LIN 1.7592057D 02 LAN-2.6568254D 01 LAP-2.0167295D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8050509D 05
X 7.0246066D 07 Y 3.5156987D 08 Z 1.8804470D 08
DX 9.0717804D 02 DY-9.7545790D 02 DZ-4.9977127D 02
R 4.0484156D 08 DEC 2.7677194D 01 RA 7.8700705D 01
V 1.4227654D 03 PTH-4.0384548D 01 AZ-9.4277895D 01
ALT 3.9846801D 08 LTGD 2.7679681D 01 LON 2.5020923D 02
VE 2.7240061D 04 PTE-1.9393230D 00 AZE-9.0170046D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 3 APRIL 1968 23 HRS., 48 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 2.7254111D 06 YSC 6.9859171D 05 ZSC 1.6953571D 05
DXSC 1.7201933D 03 DYSC-1.1318770D 03 DZSC-6.0404550D 02
RSC 2.8180397D 06 DESC 3.2453808D 00 RASC 1.4376824D 01
VSC 2.1459453D 03 PTSC 3.8944192D 01 AZSC-1.1409947D 02

SELENOGRAPHIC REFERENCE

XSG-9.6549871D 05 YSG 2.6438950D 06 ZSG-1.3776531D 05
DXSG 1.1120089D 03 DYSG 1.8358602D 03 DZSG-1.5220697D 02
HSG 1.0799502D 06 LTSG-2.8021315D 00 LNSG 1.1006120D 02
VRSG 2.1517698D 03 PTSG 3.8818963D 01 AZSG-9.2953001D 01
LTS-1.4917964D-01 LNS 1.0964055D 02 LTE-6.0274183D 00
LNE-4.2681083D 00 DSMP 4.0823656D-01 RSMP 1.1375175D 02
LIN 1.7592060D 02 LAN-2.6601923D 01 LAP-2.0167262D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8073009D 05
X 7.0433202D 07 Y 3.5134431D 08 Z 1.8793048D 08
DX 7.6037894D 02 DY-1.0244122D 03 DZ-5.1348518D 02
R 4.0462517D 08 DEC 2.7675002D 01 RA 7.8664297D 01
V 1.3752321D 03 PTH-4.6384619D 01 AZ-9.3483701D 01
ALT 3.9825161D 08 LTGD 2.7677490D 01 LON 2.4923275D 02
VE 2.7095431D 04 PTE-2.1058724D 00 AZE-9.0121881D 01

TIME 3 APRIL 1968 23 HRS., 52 MIN., 1.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 3.0982265D 06 YSC 4.4083220D 05 ZSC 2.3043627D 04
DXSC 1.5975322D 03 DYSC-1.1562363D 03 DZSC-6.0805099D 02
RSC 3.1295162D 06 DESC 4.2189090D-01 RASC 8.0979924D 00
VSC 2.0636661D 03 PTSC 4.3258496D 01 AZSC-1.1430059D 02

SELENOGRAPHIC REFERENCE

XSG-7.1062760D 05 YSG 3.0429504D 06 ZSG-1.7126764D 05
DXSG 1.1498312D 03 DYSG 1.7147649D 03 DZSG-1.4571330D 02
HSG 1.3914267D 06 LTSG-3.1371678D 00 LNSG 1.0314483D 02
VRSG 2.0697253D 03 PTSG 4.3100863D 01 AZSG-9.2594974D 01
LTS-1.4912898D-01 LNS 1.0960877D 02 LTE-6.0291787D 00
LNE-4.2713193D 00 DSMP 4.0800159D-01 RSMP 1.1372330D 02
LIN 1.7592063D 02 LAN-2.6635572D 01 LAP-2.0167224D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8095509D 05
X 7.0590049D 07 Y 3.5111068D 08 Z 1.8781433D 08
DX 6.3762809D 02 DY-1.0492584D 03 DZ-5.1775148D 02
R 4.0439571D 08 DEC 2.7673471D 01 RA 7.8632346D 01
V 1.3325087D 03 PTH-5.1315889D 01 AZ-9.2693957D 01
ALT 3.9802215D 08 LTGD 2.7675961D 01 LON 2.4826074D 02
VE 2.6967745D 04 PTE-2.2104827D 00 AZE-9.0083129D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 3 APRIL 1968 23 HRS., 55 MIN., 46.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 3.4458797D 06 YSC 1.7936421D 05 ZSC-1.1369278D 05
 DXSC 1.4959064D 03 DYSC-1.1660889D 03 DZSC-6.0674131D 02
 RSC 3.4524172D 06 DESC-1.8871688D 00 RASC 2.9796588D 00
 VSC 1.9913901D 03 PTSC 4.6834121D 01 AZSC-1.1423504D 02

SELENOGRAPHIC REFERENCE

XSG-4.4938268D 05 YSG 3.4169979D 06 ZSG-2.0338420D 05
 DXSG 1.1700792D 03 DYSG 1.6130826D 03 DZSG-1.3990500D 02
 HSG 1.7143277D 06 LTSG-3.3772878D 00 LNSG 9.7492188D 01
 VRSG 1.9976722D 03 PTSG 4.6642361D 01 AZSG-9.2274599D 01
 LTS-1.4907831D-01 LNS 1.0957699D 02 LTE-6.0309374D 00
 LNE-4.2745295D 00 DSMP 4.0776661D-01 RSMP 1.1369484D 02
 LIN 1.7592064D 02 LAN-2.6669259D 01 LAP-2.0167182D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8118009D 05
 X 7.0721714D 07 Y 3.5087323D 08 Z 1.8769788D 08
 DX 5.3591276D 02 DY-1.0595978D 03 DZ-5.1670265D 02
 R 4.0415848D 08 DEC 2.7672467D 01 RA 7.8604191D 01
 V 1.2949640D 03 PTH-5.5412029D 01 AZ-9.1900835D 01
 ALT 3.9778492D 08 LTGD 2.7674958D 01 LON 2.4729252D 02
 VE 2.6856524D 04 PTE-2.2749913D 00 AZE-9.0051957D 01

TIME 3 APRIL 1968 23 HRS., 59 MIN., 31.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 3.7726770D 06 YSC-8.3269322D 04 ZSC-2.4977668D 05
 DXSC 1.4115291D 03 DYSC-1.1673522D 03 DZSC-6.0255464D 02
 RSC 3.7813532D 06 DESC-3.7869195D 00 RASC-1.2644088D 00
 VSC 1.9282628D 03 PTSC 4.9837021D 01 AZSC-1.1402482D 02

SELENOGRAPHIC REFERENCE

XSG-1.8489549D 05 YSG 3.7700588D 06 ZSG-2.3427301D 05
 DXSG 1.1795266D 03 DYSG 1.5276849D 03 DZSG-1.3479584D 02
 HSG 2.0437637D 06 LTSG-3.5515534D 00 LNSG 9.2807710D 01
 VRSG 1.9347543D 03 PTSG 4.9609773D 01 AZSG-9.1992736D 01
 LTS-1.4902765D-01 LNS 1.0954521D 02 LTE-6.0326944D 00
 LNE-4.2777386D 00 DSMP 4.0753163D-01 RSMP 1.1366638D 02
 LIN 1.7592065D 02 LAN-2.6703003D 01 LAP-2.0167140D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8140509D 05
 X 7.0832502D 07 Y 3.5063450D 08 Z 1.8758203D 08
 DX 4.5144618D 02 DY-1.0613481D 03 DZ-5.1277687D 02
 R 4.0391684D 08 DEC 2.7671885D 01 RA 7.8579241D 01
 V 1.2622216D 03 PTH-5.8857174D 01 AZ-9.1097387D 01
 ALT 3.9754328D 08 LTGD 2.7674378D 01 LON 2.4632750D 02
 VE 2.6759656D 04 PTE-2.3137117D 00 AZE-9.0026685D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 0 HRS., 3 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 4.0821022D 06 YSC-3.4557093D 05 ZSC-3.8473335D 05
 DXSC 1.3409664D 03 DYSC-1.1635917D 03 DZSC-5.9689518D 02
 RSC 4.1147294D 06 DESC-5.3650777D 00 RASC-4.8388447D 00
 VSC 1.8730778D 03 PTSC 5.2392319D 01 AZSC-1.1373950D 02
 SELENOGRAPHIC REFERENCE
 XSG 8.0911421D 04 YSG 4.1054488D 06 ZSG-2.6408515D 05
 DXSG 1.1823477D 03 DYSG 1.4555361D 03 DZSG-1.3032362D 02
 HSG 2.3766399D 06 LTSG-3.6797975D 00 LNSG 8.8870939D 01
 VRSG 1.8797648D 03 PTSG 5.2128513D 01 AZSG-9.1746033D 01
 LTS-1.4897697D-01 LNS 1.0951343D 02 LTE-6.0344496D 00
 LNF-4.2809468D 00 DSMP 4.0729665D-01 KSMP 1.1363792D 02
 LIN 1.7592066D 02 LAN-2.6736824D 01 LAP-2.0167099D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.8163009D 05
 X 7.0925899D 07 Y 3.5039599D 08 Z 1.8746724D 08
 DX 3.8079461D 02 DY-1.0580746D 03 DZ-5.0737833D 02
 K 4.0367289D 08 DEC 2.7671645D 01 RA 7.8557000D 01
 V 1.2336771D 03 PTH-6.1790950D 01 AZ-9.0277446D 01
 ALT 3.9729933D 08 LTGD 2.7674140D 01 LON 2.4536519D 02
 VE 2.6674776D 04 PTE-2.3357823D 00 AZE-9.0005964D 01

TIME 4 APRIL 1968 0 HRS., 7 MIN., 1.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 4.3769359D 06 YSC-6.0667155D 05 ZSC-5.1833003D 05
 DXSC 1.2814109D 03 DYSC-1.1569500D 03 DZSC-5.9056484D 02
 RSC 4.4490768D 06 DESC-6.6903132D 00 RASC-7.8912855D 00
 VSC 1.8246408D 03 PTSC 5.4593527D 01 AZSC-1.1341885D 02
 SELENOGRAPHIC REFERENCE
 XSG 3.4685924D 05 YSG 4.4258503D 06 ZSG-2.9295472D 05
 DXSG 1.1811112D 03 DYSG 1.3940687D 03 DZSG-1.2640543D 02
 HSG 2.7109873D 06 LTSG-3.7754397D 00 LNSG 8.5518815D 01
 VRSG 1.8315102D 03 PTSG 5.4292323D 01 AZSG-9.1529971D 01
 LTS-1.4892629D-01 LNS 1.0948165D 02 LTE-6.0362032D 00
 LNF-4.2841540D 00 DSMP 4.0706167D-01 RSMP 1.1360946D 02
 LIN 1.7592066D 02 LAN-2.6770728D 01 LAP-2.0167059D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.8185509D 05
 X 7.1004684D 07 Y 3.5015858D 08 Z 1.8735376D 08
 DX 3.2115044D 02 DY-1.0519200D 03 DZ-5.0130896D 02
 R 4.0342797D 08 DEC 2.7671687D 01 RA 7.8537064D 01
 V 1.2087117D 03 PTH-6.4318227D 01 AZ-8.9435432D 01
 ALT 3.9705441D 08 LTGD 2.7674182D 01 LON 2.4440519D 02
 VE 2.6599757D 04 PTE-2.3470234D 00 AZE-8.9988766D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 0 HRS., 10 MIN., 46.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 4.6593959D 06 YSC-8.6608070D 05 ZSC-6.5047188D 05
 DXSC 1.2306553D 03 DYSC-1.1487220D 03 DZSC-5.8401945D 02
 RSC 4.7836367D 06 DESC-7.8152069D 00 RASC-1.0529869D 01
 VSC 1.7818960D 03 PTSC 5.6510825D 01 AZSC-1.1308566D 02

SELENOGRAPHIC REFERENCE

XSG 6.1222841D 05 YSG 4.7334255D 06 ZSG-3.2099710D 05
 DXSG 1.1774114D 03 DYSG 1.3412211D 03 DZSG-1.2295992D 02
 HSG 3.0455472D 06 LTSG-3.8476184D 00 LNSG 8.2630188D 01
 VRSG 1.7889356D 03 PTSG 5.6171565D 01 AZSG-9.1340097D 01
 LTS-1.4887561D-01 LNS 1.0944988D 02 LTE-6.0379550D 00
 LNE-4.2873603D 00 DSMP 4.0682668D-01 RSMP 1.1358100D 02
 LIN 1.7592065D 02 LAN-2.6804720D 01 LAP-2.0167022D 02

GEOCENTRIC REFERENCE

X 7.1071075D 07 Y 3.4992275D 08 Z 1.8724167D 08
 DX 2.7030646D 02 DY-1.0441791D 03 DZ-4.9502457D 02
 R 4.0318292D 08 DEC 2.7671961D 01 RA 7.8519102D 01
 V 1.1867708D 03 PTH-6.6518060D 01 AZ-8.8566151D 01
 ALT 3.9680937D 08 LTGD 2.7674459D 01 LON 2.4344716D 02
 VE 2.6532827D 04 PTE-2.3511747D 00 AZE-8.9974319D 01

FLIGHT TIME 2.8208009D 05

TIME 4 APRIL 1968 0 HRS., 14 MIN., 31.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 4.9312614D 06 YSC-1.1235373D 06 ZSC-7.8114217D 05
 DXSC 1.1869869D 03 DYSC-1.1396954D 03 DZSC-5.7751549D 02
 RSC 5.1176027D 06 DESC-8.7798504D 00 RASC-1.2835154D 01
 VSC 1.7439518D 03 PTSC 5.8197415D 01 AZSC-1.1275291D 02

SELENOGRAPHIC REFERENCE

XSG 8.7658577D 05 YSG 5.0299240D 06 ZSG-3.4831034D 05
 DXSG 1.1722483D 03 DYSG 1.2953697D 03 DZSG-1.1991497D 02
 HSG 3.3795133D 06 LTSG-3.9026380D 00 LNSG 8.0114107D 01
 VRSG 1.7511506D 03 PTSG 5.7819578D 01 AZSG-9.1172458D 01
 LTS-1.4882492D-01 LNS 1.0941810D 02 LTE-6.0397050D 00
 LNE-4.2905655D 00 DSMP 4.0659169D-01 RSMP 1.1355253D 02
 LIN 1.7592064D 02 LAN-2.6838803D 01 LAP-2.0166986D 02

GEOCENTRIC REFERENCE

X 7.1126853D 07 Y 3.4968876D 08 Z 1.8713099D 08
 DX 2.2655006D 02 DY-1.0356396D 03 DZ-4.8878166D 02
 R 4.0293829D 08 DEC 2.7672433D 01 RA 7.8502848D 01
 V 1.1673825D 03 PTH-6.8450608D 01 AZ-8.7664623D 01
 ALT 3.9656473D 08 LTGD 2.7674931D 01 LON 2.4249084D 02
 VE 2.6472554D 04 PTE-2.3506704D 00 AZE-8.9962044D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 0 HRS., 18 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 5.1939713D 06 YSC-1.3789203D 06 ZSC-9.1036769D 05
DXSC 1.1490786D 03 DYSC-1.1303513D 03 DZSC-5.7119380D 02
RSC 5.4504613D 06 DESC-9.6149374D 00 RASC-1.4868176D 01
VSC 1.7100696D 03 PTSC 5.9694130D 01 AZSC-1.1242792D 02

SELENOGRAPHIC REFERENCE

XSG 1.1396788D 06 YSG 5.3167709D 06 ZSG-3.7497747D 05
DXSG 1.1662560D 03 DYSG 1.2552420D 03 DZSG-1.1720933D 02
HSG 3.7123718D 06 LTSG-3.9449156D 00 LNSG 7.7901419D 01
VRSG 1.7174177D 03 PTSG 5.9277308D 01 AZSG-9.1023689D 01
LTS-1.4877423D-01 LNS 1.0938632D 02 LTE-6.0414534D 00
LNE-4.2937699D 00 DSMP 4.0635670D-01 RSMP 1.1352407D 02
LIN 1.7592063D 02 LAN-2.6872984D 01 LAP-2.0166954D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8253009D 05

X 7.1173454D 07 Y 3.4945673D 08 Z 1.8702171D 08
DX 1.8855393D 02 DY-1.0267827D 03 DZ-4.8272105D 02
R 4.0269441D 08 DEC 2.7673071D 01 RA 7.8488081D 01
V 1.1501543D 03 PTH-7.0162199D 01 AZ-8.6725947D 01
ALT 3.9632085D 08 LTGD 2.7675571D 01 LON 2.4153601D 02
VE 2.6417793D 04 PTE-2.3471163D 00 AZE-8.9951505D 01

TIME 4 APRIL 1968 0 HRS., 22 MIN., 1.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 5.4487007D 06 YSC-1.6321939D 06 ZSC-1.0381986D 06
DXSC 1.1158966D 03 DYSC-1.1209833D 03 DZSC-5.6512766D 02
RSC 5.7818900D 06 DESC-1.0344156D 01 RASC-1.6675930D 01
VSC 1.6796422D 03 PTSC 6.1032728D 01 AZSC-1.1211462D 02

SELENOGRAPHIC REFERENCE

XSG 1.4013698D 06 YSG 5.5951370D 06 ZSG-4.0106893D 05
DXSG 1.1598398D 03 DYSG 1.2198377D 03 DZSG-1.1479193D 02
HSG 4.0438005D 06 LTSG-3.9775963D 00 LNSG 7.5938836D 01
VRSG 1.6871306D 03 PTSG 6.0576599D 01 AZSG-9.0890980D 01
LTS-1.4872354D-01 LNS 1.0935454D 02 LTE-6.0432001D 00
LNE-4.2969732D 00 DSMP 4.0612171D-01 RSMP 1.1349561D 02
LIN 1.7592062D 02 LAN-2.6907266D 01 LAP-2.0166924D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8275509D 05

X 7.1212056D 07 Y 3.4922671D 08 Z 1.8691375D 08
DX 1.5528445D 02 DY-1.0179019D 03 DZ-4.7691603D 02
R 4.0245149D 08 DEC 2.7673853D 01 RA 7.8474621D 01
V 1.1347628D 03 PTH-7.1688950D 01 AZ-8.5745182D 01
ALT 3.9607793D 08 LTGD 2.7676355D 01 LON 2.4058248D 02
VE 2.6367631D 04 PTE-2.3415864D 00 AZE-8.9942369D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 0 HRS., 25 MIN., 46.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 5.6964180D 06 YSC-1.8833744D 06 ZSC-1.1646969D 06
DXSC 1.0866299D 03 DYSC-1.1117684D 03 DZSC-5.5935078D 02
RSC 6.1116934D 06 DESC-1.0985969D 01 RASC-1.8295142D 01
VSC 1.6521703D 03 PTSC 6.2238227D 01 AZSC-1.1181495D 02

SELENOGRAPHIC REFERENCE

XSG 1.6615949D 06 YSG 5.8659929D 06 ZSG-4.2664467D 05
DXSG 1.1532598D 03 DYSG 1.1883664D 03 DZSG-1.1262050D 02
HSG 4.3736039D 06 LTSG-4.0029553D 00 LNSG 7.4184748D 01
VRSG 1.6597910D 03 PTSG 6.1742538D 01 AZSG-9.0772005D 01
LTS-1.4867284D-01 LNS 1.0932276D 02 LTE-6.0449450D 00
LNE-4.3001756D 00 DSMP 4.0588671D-01 RSMP 1.1346714D 02
LIN 1.7592061D 02 LAN-2.6941657D 01 LAP-2.0166897D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8298009D 05

X 7.1243626D 07 Y 3.4899867D 08 Z 1.8680707D 08
DX 1.2593061D 02 DY-1.0091744D 03 DZ-4.7140031D 02
R 4.0220965D 08 DEC 2.7674760D 01 RA 7.8462316D 01
V 1.1209414D 03 PTH-7.3059366D 01 AZ-8.4717255D 01
ALT 3.9583609D 08 LTGD 2.7677263D 01 LON 2.3963011D 02
VE 2.6321337D 04 PTE-2.3348065D 00 AZE-8.9934378D 01

TIME 4 APRIL 1968 0 HRS., 29 MIN., 31.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 5.9379293D 06 YSC-2.1325091D 06 ZSC-1.2899290D 06
DXSC 1.0606366D 03 DYSC-1.1028110D 03 DZSC-5.5387371D 02
RSC 6.4397606D 06 DESC-1.1554910D 01 RASC-1.9754910D 01
VSC 1.6272425D 03 PTSC 6.3330581D 01 AZSC-1.1152966D 02

SELENOGRAPHIC REFERENCE

XSG 1.9203375D 06 YSG 6.1301498D 06 ZSG-4.6175597D 05
DXSG 1.1466829D 03 DYSG 1.1601981D 03 DZSG-1.1066008D 02
HSG 4.7016711D 06 LTSG-4.0226629D 00 LNSG 7.2606252D 01
VRSG 1.6349883D 03 PTSG 6.2795136D 01 AZSG-9.0664838D 01
LTS-1.4862213D-01 LNS 1.0929098D 02 LTE-6.0466882D 00
LNE-4.3033770D 00 DSMP 4.0565171D-01 RSMP 1.1343868D 02
LIN 1.7592060D 02 LAN-2.6976162D 01 LAP-2.0166873D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8320509D 05

X 7.1268970D 07 Y 3.4877256D 08 Z 1.8670160D 08
DX 9.9850403D 01 DY-1.0007044D 03 DZ-4.6618445D 02
R 4.0196897D 08 DEC 2.7675776D 01 RA 7.8451041D 01
V 1.1084707D 03 PTH-7.4296204D 01 AZ-8.3636879D 01
ALT 3.9559541D 08 LTGD 2.7678281D 01 LON 2.3867877D 02
VE 2.6278322D 04 PTE-2.3272723D 00 AZE-8.9927334D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 0 HRS., 33 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 6.1739113D 06 YSC-2.3796631D 06 ZSC-1.4139624D 06
DXSC 1.0374037D 03 DYSC-1.0941694D 03 DZSC-5.4869369D 02
RSC 6.7660377D 06 DESC-1.2062547D 01 RASC-2.1078582D 01
VSC 1.6045179D 03 PTSC 6.4325891D 01 AZSC-1.1125880D 02

SELENOGRAPHIC REFERENCE

XSG 2.1776109D 06 YSG 6.3882921D 06 ZSG-4.7644697D 05
DXSG 1.1402150D 03 DYSG 1.1348267D 03 DZSG-1.0888171D 02
HSG 5.0279482D 06 LTSG-4.0379630D 00 LNSG 7.1177021D 01
VRSG 1.6123824D 03 PTSG 6.3750537D 01 AZSG-9.0567881D 01
LTS-1.4857142D-01 LNS 1.0925920D 02 LTE-6.0484297D 00
LNE-4.3065774D 00 DSMP 4.0541671D-01 RSMP 1.1341021D 02
LIN 1.7592058D 02 LAN-2.7010787D 01 LAP-2.0166852D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8343009D 05
X 7.1288765D 07 Y 3.4854832D 08 Z 1.8659727D 08
DX 7.6530891D 01 DY-9.9255021D 02 DZ-4.6126566D 02
R 4.0172946D 08 DEC 2.7676889D 01 RA 7.8440687D 01
V 1.0971686D 03 PTH-7.5417823D 01 AZ-8.2498480D 01
ALT 3.9535591D 08 LTGD 2.7679395D 01 LON 2.3772835D 02
VE 2.6238107D 04 PTE-2.3193243D 00 AZE-8.9921079D 01

TIME 4 APRIL 1968 0 HRS., 37 MIN., 1.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 6.4049368D 06 YSC-2.6249112D 06 ZSC-1.5368627D 06
DXSC 1.0165176D 03 DYSC-1.0858726D 03 DZSC-5.4380045D 02
RSC 7.0905092D 06 DESC-1.2518173D 01 RASC-2.2285105D 01
VSC 1.5837128D 03 PTSC 6.5237288D 01 AZSC-1.2100201D 02

SELENOGRAPHIC REFERENCE

XSG 2.4334478D 06 YSG 6.6410012D 06 ZSG-5.0075582D 05
DXSG 1.1339223D 03 DYSG 1.1118420D 03 DZSG-1.0726128D 02
HSG 5.3524197D 06 LTSG-4.0497934D 00 LNSG 6.9875755D 01
VRSG 1.5916901D 03 PTSG 6.4621909D 01 AZSG-9.0479804D 01
LTS-1.4852070D-01 LNS 1.0922742D 02 LTE-6.0501694D 00
LNE-4.3097769D 00 DSMP 4.0518170D-01 RSMP 1.1338174D 02
LIN 1.7592057D 02 LAN-2.7045539D 01 LAP-2.0166835D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8365509D 05
X 7.1303584D 07 Y 3.4832589D 08 Z 1.8649401D 08
DX 5.5558436D 01 DY-9.8474096D 02 DZ-4.5663371D 02
R 4.0149114D 08 DEC 2.7678087D 01 RA 7.8431165D 01
V 1.0868835D 03 PTH-7.6439181D 01 AZ-8.1296139D 01
ALT 3.9511759D 08 LTGD 2.7680595D 01 LON 2.3677876D 02
VE 2.6200302D 04 PTE-2.3111972D 00 AZE-8.9915488D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 0 HRS., 40 MIN., 46.634 SEC., GMT
SELENUCENTRIC REFERENCE

XSC 6.6314948D 06 YSC-2.8683325D 06 ZSC-1.6586930D 06
DXSC 9.9764162D 02 DYSC-1.0779314D 03 DZSC-5.3917982D 02
RSC 7.4131853D 06 DESC-1.2929327D 01 RASC-2.3390017D 01
VSC 1.5645894D 03 PTSC 6.6075588D 01 AZSC-1.1075869D 02

SELENOGRAPHIC REFERENCE

XSG 2.6878924D 06 YSG 6.8887752D 06 ZSG-5.2471575D 05
DXSG 1.1278443D 03 DYSG 1.0909090D 03 DZSG-1.0577866D 02
HSG 5.6750958D 06 LTSG-4.0588701D 00 LNSG 6.8685044D 01
VRSG 1.5726743D 03 PTSG 6.5420099D 01 AZSG-9.0399493D 01
LTS-1.4846998D-01 LNS 1.0919565D 02 LTE-6.0519074D 00
LNE-4.3129754D 00 DSMP 4.0494669D-01 RSMP 1.1335328D 02
LIN 1.7592055D 02 LAN-2.7080425D 01 LAP-2.0166822D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8388009D 05

X 7.1313917D 07 Y 3.4810516D 08 Z 1.8639176D 08
DX 3.6596482D 01 DY-9.7728729D 02 DZ-4.5227439D 02
R 4.0125400D 08 DEC 2.7679362D 01 RA 7.8422395D 01
V 1.0774887D 03 PTH-7.7372566D 01 AZ-8.0023535D 01
ALT 3.9488044D 08 LTGD 2.7681872D 01 LON 2.3582992D 02
VE 2.6164583D 04 PTE-2.3030532D 00 AZE-8.9910461D 01

TIME 4 APRIL 1968 0 HRS., 44 MIN., 31.634 SEC., GMT
SELENUCENTRIC REFERENCE

XSC 6.8540054D 06 YSC-3.1100070D 06 ZSC-1.7795129D 06
DXSC 9.8049970D 02 DYSC-1.0703448D 03 DZSC-5.3481581D 02
RSC 7.7340933D 06 DESC-1.3302182D 01 RASC-2.4406184D 01
VSC 1.5469472D 03 PTSC 6.6849784D 01 AZSC-1.1052816D 02

SELENOGRAPHIC REFERENCE

XSG 2.9409959D 06 YSG 7.1320438D 06 ZSG-5.4835579D 05
DXSG 1.1220031D 03 DYSG 1.0717514D 03 DZSG-1.0441689D 02
HSG 5.9960039D 06 LTSG-4.0657453D 00 LNSG 6.7590523D 01
VRSG 1.5551349D 03 PTSG 6.6154122D 01 AZSG-9.0326013D 01
LTS-1.4841926D-01 LNS 1.0916387D 02 LTE-6.0536437D 00
LNE-4.3161729D 00 DSMP 4.0471168D-01 RSMP 1.1332481D 02
LIN 1.7592054D 02 LAN-2.7115450D 01 LAP-2.0166814D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8410509D 05

X 7.1320183D 07 Y 3.4788608D 08 Z 1.8629046D 08
DX 1.9368835D 01 DY-9.7018826D 02 DZ-4.4817174D 02
R 4.0101799D 08 DEC 2.7680707D 01 RA 7.8414311D 01
V 1.0688771D 03 PTH-7.8228151D 01 AZ-7.8673898D 01
ALT 3.9464444D 08 LTGD 2.7683218D 01 LON 2.3488177D 02
VE 2.6130685D 04 PTE-2.2950035D 00 AZE-8.9905914D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 0 HRS., 48 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 7.0728325D 06 YSC-3.3500137D 06 ZSC-1.8993781D 06
DXSC 9.6486328D 02 DYSC-1.0631047D 03 DZSC-5.3069192D 02
RSC 8.0532718D 06 DESC-1.3641834D 01 RASC-2.5344352D 01
VSC 1.5306164D 03 PTSC 6.7567415D 01 AZSC-1.1030966D 02
SELENOGRAPHIC REFERENCE
XSG 3.1928128D 06 YSG 7.3711798D 06 ZSG-5.7170149D 05
DXSG 1.1164088D 03 DYSG 1.0541398D 03 DZSG-1.0316167D 02
HSG 6.3151824D 06 LTSG-4.0708493D 00 LNSG 6.6580238D 01
VRSG 1.5389027D 03 PTSG 6.6831539D 01 AZSG-9.0258571D 01
LTS-1.4836853D-01 LNS 1.0913209D 02 LTE-6.0553783D 00
LNE-4.3193694D 00 DSMP 4.0447667D-01 RSMP 1.1329634D 02
LIN 1.7592052D 02 LAN-2.7150623D 01 LAP-2.0166810D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8433009D 05
X 7.1322746D 07 Y 3.4766855D 08 Z 1.8619007D 08
DX 3.6469846D 00 DY-9.6343577D 02 DZ-4.4430925D 02
R 4.0078311D 08 DEC 2.7682114D 01 RA 7.8406853D 01
V 1.0609583D 03 PTH-7.9014411D 01 AZ-7.7239976D 01
ALT 3.9440955D 08 LTGD 2.7684627D 01 LON 2.3393424D 02
VE 2.6098382D 04 PTE-2.2871237D 00 AZE-8.9901783D 01

TIME 4 APRIL 1968 0 HRS., 52 MIN., 1.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 7.2882925D 06 YSC-3.5884291D 06 ZSC-2.0183410D 06
DXSC 9.5054186D 02 DYSC-1.0561986D 03 DZSC-5.2679190D 02
RSC 8.3707665D 06 DESC-1.3952524D 01 RASC-2.6213570D 01
VSC 1.5154521D 03 PTSC 6.8234852D 01 AZSC-1.1010245D 02
SELENOGRAPHIC REFERENCE
XSG 3.4433990D 06 YSG 7.6065088D 06 ZSG-5.9477541D 05
DXSG 1.1110639D 03 DYSG 1.0378826D 03 DZSG-1.0200082D 02
HSG 6.6326770D 06 LTSG-4.0745205D 00 LNSG 6.5644156D 01
VRSG 1.5238331D 03 PTSG 6.7458736D 01 AZSG-9.0196493D 01
LTS-1.4831779D-01 LNS 1.0910031D 02 LTE-6.0571112D 00
LNE-4.3225649D 00 DSMP 4.0424165D-01 RSMP 1.1326787D 02
LIN 1.7592051D 02 LAN-2.7185949D 01 LAP-2.0166812D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8465509D 05
X 7.1321922D 07 Y 3.4745251D 08 Z 1.8609051D 08
DX-1.0759573D 01 DY-9.5701746D 02 DZ-4.4067066D 02
R 4.0054930D 08 DEC 2.7683578D 01 RA 7.8399970D 01
V 1.0536550D 03 PTH-7.9738445D 01 AZ-7.5714003D 01
ALT 3.9417574D 08 LTGD 2.7686092D 01 LON 2.3298729D 02
VE 2.6067487D 04 PTE-2.2794643D 00 AZE-8.9898010D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 0 HRS., 55 MIN., 46.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 7.5006629D 06 YSC-3.8253270D 06 ZSC-2.1364501D 06
DXSC 9.3737547D 02 DYSC-1.0496120D 03 DZSC-5.2310011D 02
RSC 8.6866270D 06 DESC-1.4237806D 01 RASC-2.7021513D 01
VSC 1.5013300D 03 PTSC 6.8857517D 01 AZSC-1.0990578D 02

SELENOGRAPHIC REFERENCE

XSG 3.6928105D 05 YSG 7.8383169D 06 ZSG-6.1759760D 05
DXSG 1.1059659D 03 DYSG 1.0228179D 03 DZSG-1.0092396D 02
HSG 6.9485375D 06 LTSG-4.0770271D 00 LNSG 6.4773799D 01
VRSG 1.5098022D 03 PTSG 6.8041148D 01 AZSG-9.0139202D 01
LTS-1.4826705D-01 LNS 1.0906853D 02 LTE-6.0588423D 00
LNE-4.3257595D 00 DSMP 4.0400663D-01 RSMP 1.1323940D 02
LIN 1.7592050D 02 LAN-2.7221436D 01 LAP-2.0166819D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8478009D 05
X 7.1317990D 07 Y 3.4723787D 08 Z 1.8599175D 08
DX-2.4010806D 01 DY-9.5091859D 02 DZ-4.3724035D 02
R 4.0031653D 08 DEC 2.7685094D 01 RA 7.8393616D 01
V 1.0469011D 03 PTH-8.0406224D 01 AZ-7.4087702D 01
ALT 3.9394298D 08 LTGD 2.7687610D 01 LON 2.3204087D 02
VE 2.6037841D 04 PTE-2.2720578D 00 AZE-8.9894550D 01

TIME 4 APRIL 1968 0 HRS., 59 MIN., 31.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 7.7101879D 06 YSC-4.0607773D 06 ZSC-2.2537506D 06
DXSC 9.2522889D 02 DYSC-1.0433289D 03 DZSC-5.1960184D 02
RSC 9.0009055D 06 DESC-1.4500682D 01 RASC-2.7774736D 01
VSC 1.4881431D 03 PTSC 6.9440054D 01 AZSC-1.0971896D 02

SELENOGRAPHIC REFERENCE

XSG 3.9411022D 06 YSG 8.0668567D 06 ZSG-6.4018592D 05
DXSG 1.1011087D 03 DYSG 1.0088090D 03 DZSG-9.9922138D 01
HSG 7.2628161D 06 LTSG-4.0785836D 00 LNSG 6.3961949D 01
VRSG 1.4967031D 03 PTSG 6.8583433D 01 AZSG-9.0086203D 01
LTS-1.4821631D-01 LNS 1.0903675D 02 LTE-6.0605717D 00
LNE-4.3289531D 00 DSMP 4.0377161D-01 RSMP 1.1321093D 02
LIN 1.7592049D 02 LAN-2.7257090D 01 LAP-2.0166832D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8500509D 05
X 7.1311194D 07 Y 3.4702457D 08 Z 1.8589374D 08
DX-3.6241945D 01 DY-9.4512329D 02 DZ-4.3400359D 02
R 4.0008477D 08 DEC 2.7686658D 01 RA 7.8387753D 01
V 1.0406395D 03 PTH-8.1022785D 01 AZ-7.2352300D 01
ALT 3.9371121D 08 LTGD 2.7689175D 01 LON 2.3109494D 02
VE 2.6009306D 04 PTE-2.2649239D 00 AZE-8.9891365D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 1 HRS., 3 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 7.9170837D 06 YSC-4.2948466D 06 ZSC-2.3702844D 06
DXSC 9.1398706D 02 DYSC-1.0373331D 03 DZSC-5.1628331D 02
RSC 9.3136550D 06 DESC-1.4743700D 01 RASC-2.8478872D 01
VSC 1.4757983D 03 PTSC 6.9986470D 01 AZSC-1.0954132D 02
SELENOGRAPHIC REFERENCE
XSG 4.1883273D 06 YSG 8.2923520D 06 ZSG-6.6255638D 05
DXSG 1.0964844D 03 DYSG 9.9573875D 02 DZSG-9.8987652D 01
HSG 7.5755655D 06 LTSG-4.0793624D 00 LNSG 6.3202425D 01
VRSG 1.4844434D 03 PTSG 6.9089604D 01 AZSG-9.0037068D 01
LTS-1.4816556D-01 LNS 1.0900497D 02 LTE-6.0622994D 00
LNE-4.3321457D 00 DSMP 4.0353659D-01 RSMP 1.1318245D 02
LIN 1.7592048D 02 LAN-2.7292917D 01 LAP-2.0166852D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8523009D 05
X 7.1301749D 07 Y 3.4681255D 08 Z 1.8579643D 08
DX-4.7568036D 01 DY-9.3961530D 02 DZ-4.3094662D 02
R 3.9985397D 08 DEC 2.7688265D 01 RA 7.8382344D 01
V 1.0348211D 03 PTH-8.1592380D 01 AZ-7.0498582D 01
ALT 3.9348041D 08 LTGD 2.7690784D 01 LON 2.3014947D 02
VE 2.5981766D 04 PTE-2.2580733D 00 AZE-8.9888422D 01

TIME 4 APRIL 1968 1 HRS., 7 MIN., 1.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 8.1215425D 06 YSC-4.5275975D 06 ZSC-2.4860906D 06
DXSC 9.0355154D 02 DYSC-1.0316084D 03 DZSC-5.1313180D 02
RSC 9.6249279D 06 DESC-1.4969039D 01 RASC-2.9138791D 01
VSC 1.4642150D 03 PTSC 7.0500235D 01 AZSC-1.0937225D 02
SELENOGRAPHIC REFERENCE
XSG 4.4345374D 06 YSG 8.5150026D 06 ZSG-6.8472334D 05
DXSG 1.0920837D 03 DYSG 9.8350703D 02 DZSG-9.8113812D 01
HSG 7.8868384D 06 LTSG-4.0795031D 00 LNSG 6.2489898D 01
VRSG 1.4729424D 03 PTSG 6.9563141D 01 AZSG-8.9991425D 01
LTS-1.4811480D-01 LNS 1.0897320D 02 LTE-6.0640253D 00
LNE-4.3353373D 00 DSMP 4.0330156D-01 RSMP 1.1315398D 02
LIN 1.7592047D 02 LAN-2.7328926D 01 LAP-2.0166878D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8545509D 05
X 7.1289849D 07 Y 3.4660173D 08 Z 1.8569980D 08
DX-5.8087529D 01 DY-9.3437856D 02 DZ-4.2805669D 02
R 3.9962409D 08 DEC 2.7689913D 01 RA 7.8377357D 01
V 1.0294027D 03 PTH-8.2118606D 01 AZ-6.8516996D 01
ALT 3.9325054D 08 LTGD 2.7692434D 01 LON 2.2920442D 02
VE 2.5955119D 04 PTE-2.2515100D 00 AZE-8.9885693D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 1 HRS., 10 MIN., 46.634 SEC., GMT

| | | | | | |
|-------------------------|--------------------|--------------------|---------------------------|--|--|
| SELENOCENTRIC REFERENCE | | | | | |
| XSC 8.3237360D 06 | YSC-4.7590895D 06 | ZSC-2.6012054D 06 | | | |
| DXSC 8.9383760D 02 | DYSC-1.0261393D 03 | DZSC-5.1013552D 02 | | | |
| RSC 9.9347764D 06 | DESC-1.5178572D 01 | RASC-2.9758727D 01 | | | |
| VSC 1.4533223D 03 | PTSC 7.0984378D 01 | AZSC-1.0921117D 02 | | | |
| SELENOGRAPHIC REFERENCE | | | | | |
| XSG 4.6797816D 06 | YSG 8.7349872D 06 | ZSG-7.0669979D 05 | | | |
| DXSG 1.0878969D 03 | DYSG 9.7202730D 02 | DZSG-9.7294785D 01 | | | |
| HSG 8.1966869D 06 | LTSG-4.0791194D 00 | LNSG 6.1819755D 01 | | | |
| VRSG 1.4621296D 03 | PTSG 7.0007079D 01 | AZSG-8.9948948D 01 | | | |
| LTS-1.4806405D-01 | LNS 1.0894142D 02 | LTE-6.0657495D 00 | | | |
| LNE-4.3385279D 00 | DSMP 4.0306653D-01 | RSMP 1.1312551D 02 | | | |
| LIN 1.7592046D 02 | LAN-2.7365122D 01 | LAP-2.0166912D 02 | | | |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 2.8568009D 05 | | |
| X 7.1275664D 07 | Y 3.4639206D 08 | Z 1.8560380D 08 | | | |
| DX-6.7885146D 01 | DY-9.2939745D 02 | DZ-4.2532204D 02 | | | |
| R 3.9939510D 08 | DEC 2.7691599D 01 | RA 7.8372764D 01 | | | |
| V 1.0243470D 03 | PTH-8.2604496D 01 | AZ-6.6397813D 01 | | | |
| ALT 3.9302155D 08 | LTGD 2.7694122D 01 | LON 2.2825976D 02 | | | |
| VE 2.5929280D 04 | PTE-2.2452337D 00 | AZE-8.9883154D 01 | | | |

TIME 4 APRIL 1968 1 HRS., 14 MIN., 31.634 SEC., GMT

| | | | | | |
|-------------------------|--------------------|--------------------|---------------------------|--|--|
| SELENOCENTRIC REFERENCE | | | | | |
| XSC 8.5238180D 06 | YSC-4.9893783D 06 | ZSC-2.7156624D 06 | | | |
| DXSC 8.8477196D 02 | DYSC-1.0209109D 03 | DZSC-5.0728365D 02 | | | |
| RSC 1.0243251D 07 | DESC-1.5373918D 01 | RASC-3.0342378D 01 | | | |
| VSC 1.4430583D 03 | PTSC 7.1441551D 01 | AZSC-1.0905755D 02 | | | |
| SELENOGRAPHIC REFERENCE | | | | | |
| XSG 4.9241068D 06 | YSG 8.9524664D 06 | ZSG-7.2849748D 05 | | | |
| DXSG 1.0839139D 03 | DYSG 9.6122456D 02 | DZSG-9.6525469D 01 | | | |
| HSG 8.5051615D 06 | LTSG-4.0783045D 00 | LNSG 6.1187973D 01 | | | |
| VRSG 1.4519432D 03 | PTSG 7.0424075D 01 | AZSG-8.9909353D 01 | | | |
| LTS-1.4801328D-01 | LNS 1.0890964D 02 | LTE-6.0674720D 00 | | | |
| LNE-4.3417176D 00 | DSMP 4.0283150D-01 | RSMP 1.1309703D 02 | | | |
| LIN 1.7592045D 02 | LAN-2.7401513D 01 | LAP-2.0166953D 02 | | | |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME 2.8590509D 05 | | |
| X 7.1259349D 07 | Y 3.4618348D 08 | Z 1.8550839D 08 | | | |
| DX-7.7034170D 01 | DY-9.2465702D 02 | DZ-4.2273184D 02 | | | |
| R 3.9916696D 08 | DEC 2.7693321D 01 | RA 7.8368540D 01 | | | |
| V 1.0196210D 03 | PTH-8.3052603D 01 | AZ-6.4131377D 01 | | | |
| ALT 3.9279341D 08 | LTGD 2.7695844D 01 | LON 2.2731547D 02 | | | |
| VE 2.5904171D 04 | PTE-2.2392405D 00 | AZE-8.9880785D 01 | | | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 1 HRS., 18 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 8.7219272D 06 YSC-5.2185164D 06 ZSC-2.8294931D 06
DXSC 8.7629092D 02 DYSC-1.0159089D 03 DZSC-5.0456625D 02
RSC 1.0550401D 07 DESC-1.5556482D 01 RASC-3.0892988D 01
VSC 1.4333680D 03 PTSC 7.1874087D 01 AZSC-1.0891090D 02
SELENOGRAPHIC REFERENCE
XSG 5.1675579D 06 YSG 9.1675849D 06 ZSG-7.5012708D 05
DXSG 1.0801245D 03 DYSG 9.5103347D 02 DZSG-9.5801378D 01
HSG 8.8123113D 06 LTSG-4.0771349D 00 LNSG 6.0591035D 01
VRSG 1.4423285D 03 PTSG 7.0816467D 01 AZSG-8.9872389D 01
LTS-1.4796251D-01 LNS 1.0887786D 02 LTE-6.0691927D 00
LNE-4.3449062D 00 DSMP 4.0259646D-01 RSMP 1.1306856D 02
LIN 1.7592045D 02 LAN-2.7438104D 01 LAP-2.0167003D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8613009D 05
X 7.1241043D 07 Y 3.4597594D 08 Z 1.8541356D 08
DX-8.5598305D 01 DY-9.2014309D 02 DZ-4.2027614D 02
R 3.9893963D 08 DEC 2.7695074D 01 RA 7.8364662D 01
V 1.0151958D 03 PTH-8.3465067D 01 AZ-6.1708444D 01
ALT 3.9256608D 08 LTGD 2.7697600D 01 LON 2.2637152D 02
VE 2.5879725D 04 PTE-2.2335246D 00 AZE-8.9878569D 01

TIME 4 APRIL 1968 1 HRS., 22 MIN., 1.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 8.9181886D 06 YSC-5.4465533D 06 ZSC-2.9427266D 06
DXSC 8.6833885D 02 DYSC-1.0111199D 03 DZSC-5.0197418D 02
RSC 1.0856273D 07 DESC-1.5727490D 01 RASC-3.1413419D 01
VSC 1.4242029D 03 PTSC 7.2284049D 01 AZSC-1.0877077D 02
SELENOGRAPHIC REFERENCE
XSG 5.4101772D 06 YSG 9.3804737D 06 ZSG-7.7159831D 05
DXSG 1.0765191D 03 DYSG 9.4139685D 02 DZSG-9.5118554D 01
HSG 9.1181838D 06 LTSG-4.0756739D 00 LNSG 6.0025849D 01
VRSG 1.4332372D 03 PTSG 7.1186322D 01 AZSG-8.9837836D 01
LTS-1.4791174D-01 LNS 1.0884608D 02 LTE-6.0709118D 00
LNE-4.3480939D 00 DSMP 4.0236143D-01 RSMP 1.1304008D 02
LIN 1.7592045D 02 LAN-2.7474904D 01 LAP-2.0167061D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8635509D 05
X 7.1220870D 07 Y 3.4576940D 08 Z 1.8531926D 08
DX-9.3633179D 01 DY-9.1584228D 02 DZ-4.1794582D 02
R 3.9871308D 08 DEC 2.7696859D 01 RA 7.8361108D 01
V 1.0110455D 03 PTH-8.3843675D 01 AZ-5.9120649D 01
ALT 3.9233953D 08 LTGD 2.7699386D 01 LON 2.2542790D 02
VE 2.5855884D 04 PTE-2.2280785D 00 AZE-8.9376490D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 1 HRS., 25 MIN., 46.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 9.1127156D 06 YSC-5.6735354D 06 ZSC-3.0553902D 06
 DXSC 8.6086695D 02 DYSC-1.0065315D 03 DZSC-4.9949909D 02
 RSC 1.1160914D 07 DESC-1.5888016D 01 RASC-3.1906204D 01
 VSC 1.4155200D 03 PTSC 7.2673269D 01 AZSC-1.0863673D 02

SELENOGRAPHIC REFERENCE

XSG 5.6520051D 06 YSG 9.5912520D 06 ZSG-7.9292005D 05
 DXSG 1.0730881D 03 DYSG 9.3226445D 02 DZSG-9.4473491D 01
 HSG 9.4228244D 06 LTSG-4.0739741D 00 LNSG 5.9489683D 01
 VRSG 1.4246263D 03 PTSG 7.1535474D 01 AZSG-8.9805496D 01
 LTS-1.4786096D-01 LNS 1.0881430D 02 LTE-6.0726291D 00
 LNE-4.3512806D 00 DSMP 4.0212639D-01 RSMP 1.1301161D 02
 LIN 1.7592045D 02 LAN-2.7511917D 01 LAP-2.0167129D 02

GEOCENTRIC REFERENCE

X 7.1198944D 07 Y 3.4556380D 08 Z 1.8522547D 08
 DX-1.0118758D 02 DY-9.1174202D 02 DZ-4.1573251D 02
 R 3.9848727D 08 DEC 2.7698672D 01 RA 7.8357859D 01
 V 1.0071474D 03 PTH-8.4189912D 01 AZ-5.6361097D 01
 ALT 3.9211372D 08 LTGD 2.7701201D 01 LON 2.2448458D 02
 VE 2.5832597D 04 PTE-2.2228938D 00 AZE-8.9874535D 01

TIME 4 APRIL 1968 1 HRS., 29 MIN., 31.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 9.3056115D 06 YSC-5.8995066D 06 ZSC-3.1675094D 06
 DXSC 8.5383227D 02 DYSC-1.0021318D 03 DZSC-4.9713327D 02
 RSC 1.1464366D 07 DESC-1.6039005D 01 RASC-3.2373593D 01
 VSC 1.4072808D 03 PTSC 7.3043378D 01 AZSC-1.0850841D 02

SELENOGRAPHIC REFERENCE

XSG 5.8930798D 06 YSG 9.8000280D 06 ZSG-8.1410044D 05
 DXSG 1.0698223D 03 DYSG 9.2359194D 02 DZSG-9.3863074D 01
 HSG 9.7262769D 06 LTSG-4.0720792D 00 LNSG 5.8980117D 01
 VRSG 1.4164576D 03 PTSG 7.1865557D 01 AZSG-8.9775196D 01
 LTS-1.4781018D-01 LNS 1.0878253D 02 LTE-6.0743446D 00
 LNE-4.3544662D 00 DSMP 4.0189134D-01 RSMP 1.1298313D 02
 LIN 1.7592045D 02 LAN-2.7549151D 01 LAP-2.0167205D 02

GEOCENTRIC REFERENCE

X 7.1175368D 07 Y 3.4535910D 08 Z 1.8513217D 08
 DX-1.0830448D 02 DY-9.0783058D 02 DZ-4.1362851D 02
 R 3.9826218D 08 DEC 2.7700513D 01 RA 7.8354899D 01
 V 1.0034813D 03 PTH-8.4505014D 01 AZ-5.3425090D 01
 ALT 3.9188863D 08 LTGD 2.7703043D 01 LON 2.2354156D 02
 VE 2.5809816D 04 PTE-2.2179615D 00 AZE-8.9872692D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - FIRST OPPORTUNITY (CONTINUED)

TIME 4 APRIL 1968 1 HRS., 33 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 9.4969701D 06 YSC-6.1245081D 06 ZSC-3.2791079D 06
 DXSC 8.4719682D 02 DYSC-9.9790994D 02 DZSC-4.9486968D 02
 RSC 1.1766673D 07 DESC-1.6181293D 01 RASC-3.2817593D 01
 VSC 1.3994509D 03 PTSC 7.3395834D 01 AZSC-1.0838544D 02
 SELENOGRAPHIC REFERENCE
 XSG 6.1334374D 06 YSG 1.0006901D 07 ZSG-8.3514697D 05
 DXSG 1.0667131D 03 DYSG 9.1534005D 02 DZSG-9.3284523D 01
 HSG 1.0028583D 07 LTSG-4.0700257D 00 LNSG 5.8494999D 01
 VRSG 1.4086966D 03 PTSG 7.2178032D 01 AZSG-8.9746778D 01
 LTS-1.4775939D-01 LNS 1.0875075D 02 LTE-6.0760584D 00
 LNE-4.3576509D 00 DSMP 4.0165630D-01 RSMP 1.1295465D 02
 LIN 1.7592046D 02 LAN-2.7586613D 01 LAP-2.0167292D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.8703009D 05
 X 7.1150237D 07 Y 3.4515526D 08 Z 1.8503933D 08
 DX-1.1502185D 02 DY-9.0409697D 02 DZ-4.1162677D 02
 R 3.9803777D 08 DEC 2.7702379D 01 RA 7.8352212D 01
 V 1.0000290D 03 PTH-8.4790016D 01 AZ-5.0310969D 01
 ALT 3.9166422D 08 LTGD 2.7704910D 01 LON 2.2259880D 02
 VE 2.5787501D 04 PTE-2.2132724D 00 AZE-8.9870951D 01

TIME 4 APRIL 1968 1 HRS., 37 MIN., 1.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 9.6868775D 06 YSC-6.3485786D 06 ZSC-3.3902079D 06
 DXSC 8.4092690D 02 DYSC-9.9385561D 02 DZSC-4.9270182D 02
 RSC 1.2067873D 07 DESC-1.6315620D 01 RASC-3.3240001D 01
 VSC 1.3919993D 03 PTSC 7.3731948D 01 AZSC-1.0826750D 02
 SELENOGRAPHIC REFERENCE
 XSG 6.3731124D 06 YSG 1.0211961D 07 ZSG-8.5606651D 05
 DXSG 1.0637522D 03 DYSG 9.0747388D 02 DZSG-9.2735354D 01
 HSG 1.0329783D 07 LTSG-4.0678442D 00 LNSG 5.8032406D 01
 VRSG 1.4013128D 03 PTSG 7.2474210D 01 AZSG-8.9720103D 01
 LTS-1.4770860D-01 LNS 1.0871897D 02 LTE-6.0777705D 00
 LNE-4.3608346D 00 DSMP 4.0142125D-01 RSMP 1.1292617D 02
 LIN 1.7592047D 02 LAN-2.7624309D 01 LAP-2.0167389D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.8725509D 05
 X 7.1123636D 07 Y 3.4495224D 08 Z 1.8494693D 08
 DX-1.2137339D 02 DY-9.0053097D 02 DZ-4.0972082D 02
 R 3.9781401D 08 DEC 2.7704269D 01 RA 7.8349782D 01
 V 9.9677414D 02 PTH-8.5045801D 01 AZ-4.7021028D 01
 ALT 3.9144047D 08 LTGD 2.7706802D 01 LON 2.2165631D 02
 VE 2.5765616D 04 PTE-2.2088171D 00 AZE-8.9869303D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 1 HRS., 40 MIN., 46.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 9.8754124D 06 YSC-6.5717549D 06 ZSC-3.5008304D 06
 DXSC 8.3499252D 02 DYSC-9.8995929D 02 DZSC-4.9062375D 02
 RSC 1.2368005D 07 DESC-1.6442644D 01 RASC-3.3642428D 01
 VSC 1.3848984D 03 PTSC 7.4052896D 01 AZSC-1.0815429D 02
 SELENOGRAPHIC REFERENCE
 XSG 6.6121371D 06 YSG 1.0415291D 07 ZSG-8.7686543D 05
 DXSG 1.0609319D 03 DYSG 8.9996230D 02 DZSG-9.2213335D 01
 HSG 1.0629915D 07 LTSG-4.0655604D 00 LNSG 5.7590616D 01
 VRSG 1.3942783D 03 PTSG 7.2755270D 01 AZSG-8.9695044D 01
 LTS-1.4765780D-01 LNS 1.0868719D 02 LTE-6.0794809D 00
 LNE-4.3640173D 00 DSMP 4.0118620D-01 KSMP 1.1289769D 02
 LIN 1.7592048D 02 LAN-2.7662245D 01 LAP-2.0167496D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.8748009D 05
 X 7.1095644D 07 Y 3.4475001D 08 Z 1.8485495D 08
 DX-1.2738911D 02 DY-8.9712304D 02 DZ-4.0790468D 02
 R 3.9759089D 08 DEC 2.7706182D 01 RA 7.8347597D 01
 V 9.9370215D 02 PTH-8.5273159D 01 AZ-4.3562406D 01
 ALT 3.9121734D 08 LTGD 2.7708716D 01 LON 2.2071406D 02
 VE 2.5744127D 04 PTE-2.2045862D 00 AZE-8.9867740D 01

TIME 4 APRIL 1968 1 HRS., 44 MIN., 31.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 1.0062647D 07 YSC-6.7940715D 06 ZSC-3.6109949D 06
 DXSC 8.2936687D 02 DYSC-9.8621210D 02 DZSC-4.8862997D 02
 RSC 1.2667105D 07 DESC-1.6562953D 01 RASC-3.4026328D 01
 VSC 1.3781230D 03 PTSC 7.4359742D 01 AZSC-1.0804553D 02
 SELENOGRAPHIC REFERENCE
 XSG 6.8505424D 06 YSG 1.0616969D 07 ZSG-8.9754960D 05
 DXSG 1.0582448D 03 DYSG 8.9277748D 02 DZSG-9.1716458D 01
 HSG 1.0929016D 07 LTSG-4.0631959D 00 LNSG 5.7168083D 01
 VRSG 1.3875682D 03 PTSG 7.3022276D 01 AZSG-8.9671488D 01
 LTS-1.4760699D-01 LNS 1.0865541D 02 LTE-6.0811895D 00
 LNE-4.3671990D 00 DSMP 4.0095114D-01 RSMP 1.1286921D 02
 LIN 1.7592050D 02 LAN-2.7700428D 01 LAP-2.0167615D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.8770509D 05
 X 7.1066334D 07 Y 3.4454853D 08 Z 1.8476337D 08
 DX-1.3309580D 02 DY-8.9386429D 02 DZ-4.0617287D 02
 R 3.9736836D 08 DEC 2.7708116D 01 RA 7.8345645D 01
 V 9.9079981D 02 PTH-8.5472833D 01 AZ-3.9947852D 01
 ALT 3.9099481D 08 LTGD 2.7710652D 01 LON 2.1977204D 02
 VE 2.5723006D 04 PTE-2.2005706D 00 AZE-8.9866255D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 1 HRS., 48 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 1.0248649D 07 YSC-7.0155609D 06 ZSC-3.7207198D 06
DXSC 8.2402595D 02 DYSC-9.8260579D 02 DZSC-4.8671542D 02
RSC 1.2965209D 07 DESC-1.6677072D 01 RASC-3.4393012D 01
VSC 1.3716504D 03 PTSC 7.4653449D 01 AZSC-1.0794095D 02

SELENOGRAPHIC REFERENCE

XSG 7.0883574D 06 YSG 1.0817065D 07 ZSG-9.1812448D 05
DXSG 1.0556840D 03 DYSG 8.8589441D 02 DZSG-9.1242912D 01
HSG 1.1227120D 07 LTSG-4.0607690D 00 LNSG 5.6763413D 01
VRSG 1.3811600D 03 PTSG 7.3276192D 01 AZSG-8.9649332D 01
LTS-1.4755619D-01 LNS 1.0862363D 02 LTE-6.0828964D 00
LNE-4.3703797D 00 DSMP 4.0071609D-01 KSMP 1.1284073D 02
LIN 1.7592052D 02 LAN-2.7738865D 01 LAP-2.0167745D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8793009D 05
X 7.1035772D 07 Y 3.4434776D 08 Z 1.8467217D 08
DX-1.3851748D 02 DY-8.9074646D 02 DZ-4.0452033D 02
R 3.9714641D 08 DEC 2.7710072D 01 RA 7.8343913D 01
V 9.8805519D 02 PTH-8.5645585D 01 AZ-3.6196188D 01
ALT 3.9077286D 08 LTGD 2.7712609D 01 LON 2.1883024D 02
VE 2.5702226D 04 PTE-2.1967614D 00 AZE-8.9864841D 01

TIME 4 APRIL 1968 2 HRS., 3 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 1.0981487D 07 YSC-7.8938395D 06 ZSC-4.1555548D 06
DXSC 8.0510853D 02 DYSC-9.6944279D 02 DZSC-4.7976137D 02
RSC 1.4148300D 07 DESC-1.7080442D 01 RASC-3.5709770D 01
VSC 1.3484028D 03 PTSC 7.5713230D 01 AZSC-1.0756004D 02

SELENOGRAPHIC REFERENCE

XSG 8.0342474D 06 YSG 1.1602862D 07 ZSG-9.9942721D 05
DXSG 1.0465789D 03 DYSG 8.6096133D 02 DZSG-8.9551435D 01
HSG 1.2410211D 07 LTSG-4.0507119D 00 LNSG 5.5299848D 01
VRSG 1.3581610D 03 PTSG 7.4177310D 01 AZSG-8.9572967D 01
LTS-1.4735290D-01 LNS 1.0849652D 02 LTE-6.0897066D 00
LNE-4.3830925D 00 DSMP 3.9977584D-01 KSMP 1.1272680D 02
LIN 1.7592064D 02 LAN-2.7895278D 01 LAP-2.0168391D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.8883009D 05
X 7.0902177D 07 Y 3.4355128D 08 Z 1.8431084D 08
DX-1.5775496D 02 DY-8.7953794D 02 DZ-3.9861470D 02
R 3.9626391D 08 DEC 2.7718080D 01 RA 7.8339000D 01
V 9.7845148D 02 PTH-8.6085725D 01 AZ-2.0392371D 01
ALT 3.8989036D 08 LTGD 2.7720623D 01 LON 2.1506506D 02
VE 2.5622064D 04 PTE-2.1834206D 00 AZE-8.9859796D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 2 HRS., 18 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 1.1698788D 07 YSC-8.7610740D 06 ZSC-4.5845751D 06
 DXSC 7.8935002D 02 DYSC-9.5800332D 02 DZSC-4.7375874D 02
 RSC 1.5317846D 07 DESC-1.7415343D 01 RASC-3.6829072D 01
 VSC 1.3286426D 03 PTSC 7.6620429D 01 AZSC-1.0722990D 02
 SELENOGRAPHIC REFERENCE
 XSG 8.9726708D 06 YSG 1.2367806D 07 ZSG-1.0793300D 06
 DXSG 1.0390387D 03 DYSG 8.3939626D 02 DZSG-8.8125814D 01
 HSG 1.3579756D 07 LTSG-4.0405381D 00 LNSG 5.4039635D 01
 VRSG 1.3386387D 03 PTSG 7.4926655D 01 AZSG-8.9512857D 01
 LTS-1.4714954D-01 LNS 1.0836941D 02 LTE-6.0964890D 00
 LNE-4.3957892D 00 DSMP 3.9883554D-01 RSMP 1.1261286D 02
 LIN 1.7592083D 02 LAN-2.8056263D 01 LAP-2.0169257D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.8973009D 05
 X 7.0752759D 07 Y 3.4276408D 08 Z 1.8395438D 08
 DX-1.7382886D 02 DY-8.7005375D 02 DZ-3.9366109D 02
 R 3.9538889D 08 DEC 2.7726351D 01 RA 7.8336909D 01
 V 9.7065908D 02 PTH-8.6185764D 01 AZ-5.0172939D 00
 ALT 3.8901535D 08 LTGD 2.7728901D 01 LON 2.1130270D 02
 VE 2.5545785D 04 PTE-2.1727505D 00 AZE-8.9855528D 01

TIME 4 APRIL 1968 2 HRS., 33 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 1.2403039D 07 YSC-9.6186665D 06 ZSC-5.0085502D 06
 DXSC 7.7600294D 02 DYSC-9.4796972D 02 DZSC-4.6852312D 02
 RSC 1.6475427D 07 DESC-1.7698085D 01 RASC-3.7793893D 01
 VSC 1.3116177D 03 PTSC 7.7407103D 01 AZSC-1.0694097D 02
 SELENOGRAPHIC REFERENCE
 XSG 9.9049050D 06 YSG 1.3114552D 07 ZSG-1.1580442D 06
 DXSG 1.0327838D 03 DYSG 8.2041329D 02 DZSG-8.6907153D 01
 HSG 1.4737337D 07 LTSG-4.0305967D 00 LNSG 5.2937682D 01
 VRSG 1.3218446D 03 PTSG 7.5556274D 01 AZSG-8.9465587D 01
 LTS-1.4694610D-01 LNS 1.0824230D 02 LTE-6.1032436D 00
 LNE-4.4084698D 00 DSMP 3.9789521D-01 RSMP 1.1249890D 02
 LIN 1.7592110D 02 LAN-2.8222227D 01 LAP-2.0170369D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 2.9063009D 05
 X 7.0590008D 07 Y 3.4198476D 08 Z 1.8360202D 08
 DX-1.8748662D 02 DY-8.6197624D 02 DZ-3.8947508D 02
 R 3.9452025D 08 DEC 2.7734846D 01 RA 7.8337212D 01
 V 9.6428477D 02 PTH-8.6049251D 01 AZ 8.1044325D 00
 ALT 3.8814671D 08 LTGD 2.7737402D 01 LON 2.0754274D 02
 VE 2.5472527D 04 PTE-2.1643356D 00 AZE-8.9851845D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 2 HRS., 48 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 1.3096157D 07 YSC-1.0467767D 07 ZSC-5.4281047D 06
 DXSC 7.6453931D 02 DYSC-9.3909743D 02 DZSC-4.6391519D 02
 RSC 1.7622367D 07 DESC-1.7940162D 01 RASC-3.8635366D 01
 VSC 1.2967813D 03 PTSC 7.8096665D 01 AZSC-1.0668597D 02

SELENOGRAPHIC REFERENCE

XSG 1.0832004D 07 YSG 1.3845160D 07 ZSG-1.2357360D 06
 DXSG 1.0275949D 03 DYSG 8.0345451D 02 DZSG-8.5853016D 01
 HSG 1.5884277D 07 LTSG-4.0210609D 00 LNSG 5.1961523D 01
 VRSG 1.3072342D 03 PTSG 7.6089559D 01 AZSG-8.9428654D 01
 LTS-1.4674257D-01 LNS 1.0811519D 02 LTE-6.1099702D 00
 LNE-4.4211341D 00 DSMP 3.9695483D-01 RSMP 1.1238493D 02
 LIN 1.7592147D 02 LAN-2.8393575D 01 LAP-2.0171755D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.9153009D 05
 X 7.0415848D 07 Y 3.4121217D 08 Z 1.8325313D 08
 DX-1.9925624D 02 DY-8.5506085D 02 DZ-3.8591736D 02
 R 3.9365702D 08 DEC 2.7743537D 01 RA 7.8339578D 01
 V 9.5904344D 02 PTH-8.5775672D 01 AZ 1.8424107D 01
 ALT 3.8728348D 08 LTGD 2.7746099D 01 LON 2.0378484D 02
 VE 2.5401668D 04 PTE-2.1578364D 00 AZE-8.9848613D 01

TIME 4 APRIL 1968 3 HRS., 3 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 1.3779658D 07 YSC-1.1309333D 07 ZSC-5.8437534D 06
 DXSC 7.5457543D 02 DYSC-9.3119566D 02 DZSC-4.5982785D 02
 RSC 1.8759782D 07 DESC-1.8149911D 01 RASC-3.9376636D 01
 VSC 1.2837255D 03 PTSC 7.8706659D 01 AZSC-1.0645928D 02

SELENOGRAPHIC REFERENCE

XSG 1.1754847D 07 YSG 1.4561259D 07 ZSG-1.3125387D 06
 DXSG 1.0232992D 03 DYSG 7.8811262D 02 DZSG-8.4932021D 01
 HSG 1.7021693D 07 LTSG-4.0120090D 00 LNSG 5.1087149D 01
 VRSG 1.2944018D 03 PTSG 7.6544025D 01 AZSG-8.9400176D 01
 LTS-1.4653897D-01 LNS 1.0798808D 02 LTE-6.1166690D 00
 LNE-4.4337821D 00 DSMP 3.9601441D-01 RSMP 1.1227095D 02
 LIN 1.7592194D 02 LAN-2.8570710D 01 LAP-2.0173442D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.9243009D 05
 X 7.0231797D 07 Y 3.4044536D 08 Z 1.8290721D 08
 DX-2.0952141D 02 DY-8.4911677D 02 DZ-3.8288082D 02
 R 3.9279841D 08 DEC 2.7752399D 01 RA 7.8343743D 01
 V 9.5472312D 02 PTH-8.5436004D 01 AZ 2.8287693D 01
 ALT 3.8642488D 08 LTGD 2.7754967D 01 LON 2.0002874D 02
 VE 2.5332748D 04 PTE-2.1529764D 00 AZE-8.9845736D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 3 HRS., 18 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 1.4454757D 07 YSC-1.2144165D 07 ZSC-6.2559257D 06
DXSC 7.4582561D 02 DYSC-9.2411359D 02 DZSC-4.5617744D 02
RSC 1.9888623D 07 DESC-1.8333525D 01 RASC-4.0035299D 01
VSC 1.2721398D 03 PTSC 7.9250520D 01 AZSC-1.0625648D 02
SELENOGRAPHIC REFERENCE
XSG 1.2674173D 07 YSG 1.5264160D 07 ZSG-1.3885610D 06
DXSG 1.0197583D 03 DYSG 7.7408308D 02 DZSG-8.4120444D 01
HSG 1.8150534D 07 LTSG-4.0034674D 00 LNSG 5.0296392D 01
VRSG 1.2830385D 03 PTSG 7.6933075D 01 AZSG-8.9378700D 01
LTS-1.4633528D-01 LNS 1.0786097D 02 LTE-6.1233398D 00
LNE-4.4464138D 00 DSMP 3.9507395D-01 RSMP 1.1215695D 02
LIN 1.7592254D 02 LAN-2.8754031D 01 LAP-2.0175455D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.9333009D 05
X 7.0039074D 07 Y 3.3968352D 08 Z 1.8256382D 08
DX-2.1856781D 02 DY-8.4399317D 02 DZ-3.8028179D 02
R 3.9194376D 08 DEC 2.7761415D 01 RA 7.8349496D 01
V 9.5116276D 02 PTH-8.5072585D 01 AZ 3.2276660D 01
ALT 3.8557023D 08 LTGD 2.7763989D 01 LUN 1.9627422D 02
VE 2.5265416D 04 PTE-2.1495298D 00 AZE-8.9843144D 01

TIME 4 APRIL 1968 3 HRS., 33 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 1.5122443D 07 YSC-1.2972947D 07 ZSC-6.6649839D 06
DXSC 7.3807268D 02 DYSC-9.1773052D 02 DZSC-4.5289765D 02
RSC 2.1009703D 07 DESC-1.8495706D 01 RASC-4.0624987D 01
VSC 1.2617832D 03 PTSC 7.9738727D 01 AZSC-1.0607407D 02
SELENOGRAPHIC REFERENCE
XSG 1.3590609D 07 YSG 1.5954937D 07 ZSG-1.4638927D 06
DXSG 1.0168611D 03 DYSG 7.6113349D 02 DZSG-8.3400000D 01
HSG 1.9271614D 07 LTSG-3.9954342D 00 LNSG 4.9575237D 01
VRSG 1.2729046D 03 PTSG 7.7267157D 01 AZSG-8.9363082D 01
LTS-1.4613150D-01 LNS 1.0773386D 02 LTE-6.1299826D 00
LNE-4.4590289D 00 DSMP 3.9413344D-01 RSMP 1.1204295D 02
LIN 1.7592325D 02 LAN-2.8943937D 01 LAP-2.0177823D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.9423009D 05
X 6.9838675D 07 Y 3.3892596D 08 Z 1.8222259D 08
DX-2.2661262D 02 DY-8.3956934D 02 DZ-3.7805396D 02
R 3.9109247D 08 DEC 2.7770570D 01 RA 7.8356664D 01
V 9.4823771D 02 PTH-8.4708373D 01 AZ 3.6901073D 01
ALT 3.8471894D 08 LTGD 2.7773151D 01 LUN 1.9252112D 02
VE 2.5199400D 04 PTE-2.1473114D 00 AZE-8.9840781D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 3 HRS., 48 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 1.5783536D 07 YSC-1.3796260D 07 ZSC-7.0712366D 06
DXSC 7.3114854D 02 DYSC-9.1194876D 02 DZSC-4.4993525D 02
RSC 2.2123724D 07 DESC-1.8640086D 01 RASC-4.1156440D 01
VSC 1.2524658D 03 PTSC 8.0179590D 01 AZSC-1.0590922D 02

SELENOGRAPHIC REFERENCE

XSG 1.4504692D 07 YSG 1.6634475D 07 ZSG-1.5386093D 06
DXSG 1.0145167D 03 DYSG 7.4908331D 02 DZSG-8.2756362D 01
HSG 2.0385635D 07 LTSG-3.9878924D 00 LNSG 4.8912685D 01
VRSG 1.2638111D 03 PTSG 7.7554549D 01 AZSG-8.9352404D 01
LTS-1.4592765D-01 LNS 1.0760675D 02 LTE-6.1365974D 00
LNE-4.4716275D 00 DSMP 3.9319290D-01 RSMP 1.1192893D 02
LIN 1.7592411D 02 LAN-2.9140826D 01 LAP-2.0180571D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.9513009D 05

X 6.9631421D 07 Y 3.3817211D 08 Z 1.8188322D 08
DX-2.3382393D 02 DY-8.3574760D 02 DZ-3.7614410D 02
R 3.9024405D 08 DEC 2.7779853D 01 RA 7.8365102D 01
V 9.4584991D 02 PTH-8.4355074D 01 AZ 4.0538854D 01
ALT 3.8387052D 08 LTGD 2.7782439D 01 LON 1.8876929D 02
VE 2.5134486D 04 PTE-2.1461681D 00 AZE-8.9838609D 01

TIME 4 APRIL 1968 4 HRS., 3 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 1.6438719D 07 YSC-1.4614611D 07 ZSC-7.4749495D 06
DXSC 7.2492098D 02 DYSC-9.0668839D 02 DZSC-4.4724699D 02
RSC 2.3231298D 07 DESC-1.8769517D 01 RASC-4.1638240D 01
VSC 1.2440354D 03 PTSC 8.0579787D 01 AZSC-1.0575963D 02

SELENOGRAPHIC REFERENCE

XSG 1.5416886D 07 YSG 1.7303519D 07 ZSG-1.6127746D 06
DXSG 1.0126506D 03 DYSG 7.3779003D 02 DZSG-8.2178135D 01
HSG 2.1493208D 07 LTSG-3.9808175D 00 LNSG 4.8299973D 01
VRSG 1.2556069D 03 PTSG 7.7801901D 01 AZSG-8.9345918D 01
LTS-1.4572371D-01 LNS 1.0747965D 02 LTE-6.1431841D 00
LNE-4.4842095D 00 DSMP 3.9225231D-01 RSMP 1.1181489D 02
LIN 1.7592511D 02 LAN-2.9345094D 01 LAP-2.0183727D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.9603009D 05

X 6.9418002D 07 Y 3.3742146D 08 Z 1.8154545D 08
DX-2.4033394D 02 DY-8.3244800D 02 DZ-3.7450895D 02
R 3.8939806D 08 DEC 2.7789253D 01 RA 7.8374690D 01
V 9.4392110D 02 PTH-8.4018233D 01 AZ 4.3455708D 01
ALT 3.8302454D 08 LTGD 2.7791846D 01 LON 1.8501862D 02
VE 2.5070502D 04 PTE-2.1459726D 00 AZE-8.9836593D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 4 HRS., 18 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 1.7088571D 07 YSC-1.5428436D 07 ZSC-7.8763528D 06
 DXSC 7.1928457D 02 DYSC-9.0188340D 02 DZSC-4.4479737D 02
 RSC 2.4332957D 07 DESC-1.8886271D 01 RASC-4.2077336D 01
 VSC 1.2363691D 03 PTSC 8.0944759D 01 AZSC-1.0562342D 02

SELENOGRAPHIC REFERENCE

XSG 1.6327593D 07 YSG 1.7962696D 07 ZSG-1.6864430D 06
 DXSG 1.0112011D 03 DYSG 7.2713963D 02 DZSG-8.1656140D 01
 HSG 2.2594868D 07 LTSG-3.9741815D 00 LNSG 4.7730029D 01
 VRSG 1.2481696D 03 PTSG 7.8014625D 01 AZSG-8.9343008D 01
 LTS-1.4551968D-01 LNS 1.0735254D 02 LTE-6.1497428D 00
 LNE-4.4967747D 00 DSMP 3.9131168D-01 RSMP 1.1170085D 02
 LIN 1.7592627D 02 LAN-2.9557138D 01 LAP-2.0187316D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.9693009D 05
 X 6.9198999D 07 Y 3.3667357D 08 Z 1.8120904D 08
 DX-2.4624810D 02 DY-8.2960454D 02 DZ-3.7311301D 02
 R 3.8855412D 08 DEC 2.7798762D 01 RA 7.8385325D 01
 V 9.4238799D 02 PTH-8.3700077D 01 AZ 4.5836740D 01
 ALT 3.8218060D 08 LTGD 2.7801361D 01 LON 1.8126899D 02
 VE 2.5007308D 04 PTE-2.1466186D 00 AZE-8.9834710D 01

TIME 4 APRIL 1968 4 HRS., 33 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 1.7733583D 07 YSC-1.6238121D 07 ZSC-8.2756475D 06
 DXSC 7.1415414D 02 DYSC-8.9747878D 02 DZSC-4.4255694D 02
 RSC 2.5429173D 07 DESC-1.8992179D 01 RASC-4.2479418D 01
 VSC 1.2293661D 03 PTSC 8.1278983D 01 AZSC-1.0549901D 02

SELENOGRAPHIC REFERENCE

XSG 1.7237162D 07 YSG 1.8612541D 07 ZSG-1.7596619D 06
 DXSG 1.0101163D 03 DYSG 7.1703974D 02 DZSG-8.1182894D 01
 HSG 2.3691084D 07 LTSG-3.9679557D 00 LNSG 4.7197080D 01
 VRSG 1.2413991D 03 PTSG 7.8197174D 01 AZSG-8.9343158D 01
 LTS-1.4531557D-01 LNS 1.0722543D 02 LTE-6.1562733D 00
 LNE-4.5093232D 00 DSMP 3.9037100D-01 RSMP 1.1158679D 02
 LIN 1.7592759D 02 LAN-2.9777350D 01 LAP-2.0191366D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 2.9783009D 05
 X 6.8974908D 07 Y 3.3592805D 08 Z 1.8087378D 08
 DX-2.5165155D 02 DY-8.2716220D 02 DZ-3.7192682D 02
 R 3.8771190D 08 DEC 2.7808374D 01 RA 7.8396922D 01
 V 9.4119890D 02 PTH-8.3401081D 01 AZ 4.7812006D 01
 ALT 3.8133839D 08 LTGD 2.7810979D 01 LON 1.7752032D 02
 VE 2.4944790D 04 PTE-2.1480163D 00 AZE-8.9832939D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 4 HRS., 48 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 1.8374179D 07 YSC-1.7044004D 07 ZSC-8.6730106D 06
 DXSC 7.0946015D 02 DYSC-8.9342833D 02 DZSC-4.4050109D 02
 RSC 2.6520362D 07 DEFC-1.9088735D 01 RASC-4.2849192D 01
 VSC 1.2229428D 03 PTSC 8.1586184D 01 AZSC-1.0538510D 02

SELENOGRAPHIC REFERENCE

XSG 1.8145903D 07 YSG 1.9253516D 07 ZSG-1.8324722D 06
 DXSG 1.0093528D 03 DYSG 7.0741469D 02 DZSG-8.0752235D 01
 HSG 2.4782273D 07 LTSG-3.9621119D 00 LNSG 4.6696360D 01
 VRSG 1.2352123D 03 PTSG 7.8353247D 01 AZSG-8.9345935D 01
 LTS-1.4511137D-01 LNS 1.0709833D 02 LTE-6.1627756D 00
 LNE-4.5218547D 00 DSMP 3.8943029D-01 RSMP 1.1147272D 02
 LIN 1.7592908D 02 LAN-3.0006124D 01 LAP-2.0195903D 02

GEOCENTRIC REFERENCE

X 6.8746158D 07 Y 3.3518457D 08 Z 1.8053951D 08
 DX-2.5661385D 02 DY-8.2507476D 02 DZ-3.7092577D 02
 R 3.8687110D 08 DEC 2.7818082D 01 RA 7.8409403D 01
 V 9.4031110D 02 PTH-8.3120802D 01 AZ 4.9474300D 01
 ALT 3.8049758D 08 LTGD 2.7820694D 01 LON 1.7377253D 02
 VE 2.4882852D 04 PTE-2.1500896D 00 AZE-8.9831264D 01

TIME 4 APRIL 1968 5 HRS., 3 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 1.9010725D 07 YSC-1.7846386D 07 ZSC-9.0685986D 06
 DXSC 7.0514523D 02 DYSC-8.8969293D 02 DZSC-4.3860908D 02
 RSC 2.7606895D 07 DESC-1.9177170D 01 RASC-4.3190591D 01
 VSC 1.2170297D 03 PTSC 8.1869484D 01 AZSC-1.0528059D 02

SELENOGRAPHIC REFERENCE

XSG 1.9054088D 07 YSG 1.9886017D 07 ZSG-1.9049099D 06
 DXSG 1.0088735D 03 DYSG 6.9820186D 02 DZSG-8.0359041D 01
 HSG 2.5868805D 07 LTSG-3.9566234D 00 LNSG 4.6223898D 01
 VRSG 1.2295402D 03 PTSG 7.8485946D 01 AZSG-8.9350968D 01
 LTS-1.4490709D-01 LNS 1.0697122D 02 LTE-6.1692497D 00
 LNE-4.5343694D 00 DSMP 3.3848953D-01 RSMP 1.1135863D 02
 LIN 1.7593076D 02 LAN-3.0243852D 01 LAP-2.0200953D 02

GEOCENTRIC REFERENCE

X 6.8513118D 07 Y 3.3444282D 08 Z 1.8020607D 08
 DX-2.6119236D 02 DY-8.2330311D 02 DZ-3.7008912D 02
 R 3.8603144D 08 DEC 2.7827882D 01 RA 7.8422705D 01
 V 9.3968900D 02 PTH-8.2858341D 01 AZ 5.0891025D 01
 ALT 3.7965793D 08 LTGD 2.7830500D 01 LON 1.7002557D 02
 VE 2.4821414D 04 PTE-2.1527737D 00 AZE-8.9829670D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 5 HRS., 18 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 1.9643540D 07 YSC-1.8645536D 07 ZSC-9.4625508D 06
 DXSC 7.0116160D 02 DYSC-8.8623925D 02 DZSC-4.3686329D 02
 RSC 2.8689101D 07 DESC-1.9258508D 01 RASC-4.3506922D 01
 VSC 1.2115680D 03 PTSC 8.2131526D 01 AZSC-1.0518453D 02

SELENOGRAPHIC REFERENCE

XSG 1.9961957D 07 YSG 2.0510393D 07 ZSG-1.9770066D 06
 DXSG 1.0086468D 03 DYSG 6.8934893D 02 DZSG-7.9999015D 01
 HSG 2.6951011D 07 LTSG-3.9514649D 00 LNSG 4.5776359D 01
 VRSG 1.2243244D 03 PTSG 7.8597894D 01 AZSG-8.9357943D 01
 LTS-1.4470271D-01 LNS 1.0684412D 02 LTE-6.1756956D 00
 LNE-4.5468670D 00 DSMP 3.8754874D-01 RSMP 1.1124453D 02
 LIN 1.7593263D 02 LAN-3.0490924D 01 LAP-2.0206543D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.0053009D 05
 X 6.8276113D 07 Y 3.3370254D 08 Z 1.7987331D 08
 DX-2.6543484D 02 DY-8.2181389D 02 DZ-3.6939924D 02
 R 3.8519270D 08 DEC 2.7837768D 01 RA 7.8436771D 01
 V 9.3930268D 02 PTH-8.2612601D 01 AZ 5.2112021D 01
 ALT 3.7881920D 08 LTGD 2.7840393D 01 LON 1.6627936D 02
 VE 2.4760408D 04 PTE-2.1560130D 00 AZE-8.9828146D 01

TIME 4 APRIL 1968 5 HRS., 33 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 2.0272903D 07 YSC-1.9441693D 07 ZSC-9.8549918D 06
 DXSC 6.9746918D 02 DYSC-8.8303870D 02 DZSC-4.3524866D 02
 RSC 2.9767278D 07 DESC-1.9333607D 01 RASC-4.3800995D 01
 VSC 1.2065082D 03 PTSC 8.2374562D 01 AZSC-1.0509614D 02

SELENOGRAPHIC REFERENCE

XSG 2.0869725D 07 YSG 2.1126947D 07 ZSG-2.0487907D 06
 DXSG 1.0086457D 03 DYSG 6.8081207D 02 DZSG-7.9668529D 01
 HSG 2.8029189D 07 LTSG-3.9466131D 00 LNSG 4.5350920D 01
 VRSG 1.2195156D 03 PTSG 7.8691323D 01 AZSG-8.9366586D 01
 LTS-1.4449825D-01 LNS 1.0671701D 02 LTE-6.1821132D 00
 LNE-4.5593474D 00 DSMP 3.8660790D-01 RSMP 1.1113042D 02
 LIN 1.7593469D 02 LAN-3.0747730D 01 LAP-2.0212699D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.0143009D 05
 X 6.8035425D 07 Y 3.3296348D 08 Z 1.7954111D 08
 DX-2.6938139D 02 DY-8.2057852D 02 DZ-3.6884107D 02
 R 3.8435466D 08 DEC 2.7847739D 01 RA 7.8451550D 01
 V 9.3912682D 02 PTH-8.2382420D 01 AZ 5.3174787D 01
 ALT 3.7798116D 08 LTGD 2.7850369D 01 LON 1.6253388D 02
 VE 2.4699775D 04 PTE-2.1597596D 00 AZE-8.9826685D 01

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 5 HRS., 48 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 2.0899061D 07 YSC-2.0235074D 07 ZSC-1.0246034D 07
DXSC 6.9403403D 02 DYSC-8.8006661D 02 DZSC-4.3375224D 02
RSC 3.0841695D 07 DESC-1.9403192D 01 RASC-4.4075209D 01
VSC 1.2018076D 03 PTSC 8.2600522D 01 AZSC-1.0501472D 02

SELENOGRAPHIC REFERENCE

XSG 2.1777585D 07 YSG 2.1735946D 07 ZSG-2.1202872D 06
DXSG 1.0088467D 03 DYSG 6.7255379D 02 DZSG-7.9364495D 01
HSG 2.9103606D 07 LTSG-3.9420465D 00 LNSG 4.4945169D 01
VRSG 1.2150716D 03 PTSG 7.8768147D 01 AZSG-8.9376665D 01
LTS-1.4429370D-01 LNS 1.0658991D 02 LTE-6.1885025D 00
LNE-4.5718107D 00 DSMP 3.8566702D-01 RSMP 1.1101629D 02
LIN 1.7593695D 02 LAN-3.1014655D 01 LAP-2.0219448D 02

GEOCENTRIC REFERENCE

X 6.7791305D 07 Y 3.3222543D 08 Z 1.7920936D 08
DX-2.7306593D 02 DY-8.1957233D 02 DZ-3.6840165D 02
R 3.8351713D 08 DEC 2.7857789D 01 RA 7.8466998D 01
V 9.3913981D 02 PTH-8.2166648D 01 AZ 5.4107987D 01
ALT 3.7714363D 08 LTGD 2.7860426D 01 LON 1.5878906D 02
VE 2.4639467D 04 PTE-2.1639719D 00 AZE-8.9825276D 01

FLIGHT TIME 3.0233009D 05

TIME 4 APRIL 1968 6 HRS., 3 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 2.1522233D 07 YSC-2.1025875D 07 ZSC-1.0635778D 07
DXSC 6.9082728D 02 DYSC-8.7730160D 02 DZSC-4.3236283D 02
RSC 3.1912594D 07 DESC-1.9467880D 01 RASC-4.4331626D 01
VSC 1.1974298D 03 PTSC 8.2811073D 01 AZSC-1.0493968D 02

SELENOGRAPHIC REFERENCE

XSG 2.2685709D 07 YSG 2.2337625D 07 ZSG-2.1915187D 06
DXSG 1.0092293D 03 DYSG 6.6454227D 02 DZSG-7.9084269D 01
HSG 3.0174505D 07 LTSG-3.9377454D 00 LNSG 4.4557042D 01
VRSG 1.2109560D 03 PTSG 7.8830019D 01 AZSG-8.9387973D 01
LTS-1.4408906D-01 LNS 1.0646281D 02 LTE-6.1948634D 00
LNE-4.5842567D 00 DSMP 3.8472610D-01 RSMP 1.1090215D 02
LIN 1.7593942D 02 LAN-3.1292084D 01 LAP-2.0226816D 02

GEOCENTRIC REFERENCE

X 6.7543976D 07 Y 3.3148819D 08 Z 1.7887795D 08
DX-2.7651735D 02 DY-8.1877391D 02 DZ-3.6806978D 02
R 3.8267993D 08 DEC 2.7867917D 01 RA 7.8483077D 01
V 9.3932311D 02 PTH-8.1964187D 01 AZ 5.4933866D 01
ALT 3.7630643D 08 LTGD 2.7970560D 01 LON 1.5504487D 02
VE 2.4579439D 04 PTE-2.1686141D 00 AZE-8.9823914D 01

FLIGHT TIME 3.0323009D 05

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 6 HRS., 18 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 2.2142611D 07 YSC-2.1814273D 07 ZSC-1.1024316D 07
DXSC 6.8782414D 02 DYSC-8.7472502D 02 DZSC-4.3107068D 02
RSC 3.2980195D 07 DESC-1.9528200D 01 RASC-4.4572032D 01
VSC 1.1933431D 03 PTSC 8.3007662D 01 AZSC-1.0487052D 02

SELENOGRAPHIC REFERENCE

XSG 2.3594253D 07 YSG 2.2932195D 07 ZSG-2.2625057D 06
DXSG 1.0097758D 03 DYSG 6.5675014D 02 DZSG-7.8825571D 01
HSG 3.1242106D 07 LTSG-3.9336916D 00 LNSG 4.4184750D 01
VRSG 1.2071377D 03 PTSG 7.8878371D 01 AZSG-8.9400333D 01
LTS-1.4388433D-01 LNS 1.0633570D 02 LTE-6.2011959D 00
LNE-4.5966853D 00 DSMP 3.8378513D-01 RSMP 1.1078800D 02
LIN 1.7594210D 02 LAN-3.1580398D 01 LAP-2.0234829D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.0413009D 05
X 6.7293636D 07 Y 3.3075158D 08 Z 1.7854680D 08
DX-2.7976041D 02 DY-8.1816461D 02 DZ-3.6783571D 02
R 3.8184290D 08 DEC 2.7878119D 01 RA 7.8499752D 01
V 9.3966075D 02 PTH-8.1774008D 01 AZ 5.5669916D 01
ALT 3.7546941D 08 LTGD 2.7880769D 01 LUN 1.5130128D 02
VE 2.4519654D 04 PTE-2.1736544D 00 AZE-8.9822593D 01

TIME 4 APRIL 1968 6 HRS., 33 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE

XSC 2.2760371D 07 YSC-2.2600431D 07 ZSC-1.1411732D 07
DXSC 6.8500326D 02 DYSC-8.7232054D 02 DZSC-4.2986730D 02
RSC 3.4044700D 07 DESC-1.9584607D 01 RASC-4.4797977D 01
VSC 1.1895203D 03 PTSC 8.3191552D 01 AZSC-1.0480679D 02

SELENOGRAPHIC REFERENCE

XSG 2.4503357D 07 YSG 2.3519842D 07 ZSG-2.3332665D 06
DXSG 1.0104707D 03 DYSG 6.4915370D 02 DZSG-7.8586430D 01
HSG 3.2306610D 07 LTSG-3.9298686D 00 LNSG 4.3826744D 01
VRSG 1.2035893D 03 PTSG 7.8914454D 01 AZSG-8.9413591D 01
LTS-1.4367951D-01 LNS 1.0620860D 02 LTE-6.2075000D 00
LNE-4.6090965D 00 DSMP 3.8284413D-01 RSMP 1.1067383D 02
LIN 1.7594500D 02 LAN-3.1879976D 01 LAP-2.0243512D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.0503009D 05
X 6.7040463D 07 Y 3.3001544D 08 Z 1.7821582D 08
DX-2.8281647D 02 DY-8.1772809D 02 DZ-3.6769094D 02
R 3.8100590D 08 DEC 2.7888395D 01 RA 7.8516991D 01
V 9.4013882D 02 PTH-8.1595160D 01 AZ 5.6330072D 01
ALT 3.7463241D 08 LTGD 2.7891051D 01 LON 1.4755825D 02
VE 2.4460078D 04 PTE-2.1790653D 00 AZE-8.9821307D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 6 HRS., 48 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 2.3375666D 07 YSC-2.3384498D 07 ZSC-1.1798102D 07
 DXSC 6.8234612D 02 DYSC-8.7007379D 02 DZSC-4.2874520D 02
 RSC 3.5106291D 07 DESC-1.9637495D 01 RASC-4.5010818D 01
 VSC 1.1859372D 03 PTSC 8.3363849D 01 AZSC-1.0474810D 02

SELENOGRAPHIC REFERENCE

XSG 2.5413147D 07 YSG 2.4100732D 07 ZSG-2.4038181D 06
 DXSG 1.0113000D 03 DYSG 6.4173238D 02 DZSG-7.8365126D 01
 HSG 3.3368202D 07 LTSG-3.9262613D 00 LNSG 4.3481671D 01
 VRSG 1.2002872D 03 PTSG 7.8939362D 01 AZSG-8.9427611D 01
 LTS-1.4347460D-01 LNS 1.0608150D 02 LTE-6.2137756D 00
 LNE-4.6214902D 00 DSMP 3.8190308D-01 RSMP 1.1055965D 02
 LIN 1.7594811D 02 LAN-3.2191192D 01 LAP-2.0252892D 02

GEOCENTRIC REFERENCE

X 6.6784617D 07 Y 3.2927962D 08 Z 1.7788493D 08
 DX-2.8570406D 02 DY-8.1744997D 02 DZ-3.6762797D 02
 R 3.8016878D 08 DEC 2.7898741D 01 RA 7.8534767D 01
 V 9.4074523D 02 PTH-8.1426768D 01 AZ 5.6925554D 01
 ALT 3.7379529D 08 LTGD 2.7901404D 01 LON 1.4381576D 02
 VE 2.4400683D 04 PTE-2.1848226D 00 AZE-8.9820054D 01

TIME 4 APRIL 1968 7 HRS., 3 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 2.3988638D 07 YSC-2.4166608D 07 ZSC-1.2183496D 07
 DXSC 6.7983658D 02 DYSC-8.6797208D 02 DZSC-4.2769782D 02
 RSC 3.6165138D 07 DESC-1.9687208D 01 RASC-4.5211747D 01
 VSC 1.1825729D 03 PTSC 8.3525529D 01 AZSC-1.0469410D 02

SELENOGRAPHIC REFERENCE

XSG 2.6323740D 07 YSG 2.4675015D 07 ZSG-2.4741756D 06
 DXSG 1.0122518D 03 DYSG 6.3446819D 02 DZSG-7.8160158D 01
 HSG 3.4427049D 07 LTSG-3.9228560D 00 LNSG 4.3148343D 01
 VRSG 1.1972104D 03 PTSG 7.8954061D 01 AZSG-8.9442273D 01
 LTS-1.4326960D-01 LNS 1.0595440D 02 LTE-6.2200228D 00
 LNE-4.6338663D 00 DSMP 3.8096200D-01 RSMP 1.1044546D 02
 LIN 1.7595144D 02 LAN-3.2514416D 01 LAP-2.0262994D 02

GEOCENTRIC REFERENCE

X 6.6526242D 07 Y 3.2854399D 08 Z 1.7755407D 08
 DX-2.8843930D 02 DY-8.1731757D 02 DZ-3.6764024D 02
 R 3.7933144D 08 DEC 2.7909156D 01 RA 7.8553055D 01
 V 9.4146938D 02 PTH-8.1268033D 01 AZ 5.7465496D 01
 ALT 3.7295795D 08 LTGD 2.7911826D 01 LON 1.4007378D 02
 VE 2.4341442D 04 PTE-2.1909049D 00 AZE-8.9818828D 01

05-15481-1

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 7 HRS., 18 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 2.4599412D 07 YSC-2.4946887D 07 ZSC-1.2567978D 07
DXSC 6.7746050D 02 DYSC-8.6600416D 02 DZSC-4.2671931D 02
RSC 3.7221396D 07 DESC-1.9734047D 01 RASC-4.5401814D 01
VSC 1.1794089D 03 PTSC 8.3677455D 01 AZSC-1.0464450D 02
SELENOGRAPHIC REFERENCE
XSG 2.7235241D 07 YSG 2.5242826D 07 ZSG-2.5443534D 06
DXSG 1.0133152D 03 DYSG 6.2734535D 02 DZSG-7.7970206D 01
HSG 3.5483307D 07 LTSG-3.9196400D 00 LNSG 4.2825714D 01
VRSG 1.1943405D 03 PTSG 7.8959404D 01 AZSG-8.9457474D 01
LTS-1.4306450D-01 LNS 1.0582730D 02 LTE-6.2262414D 00
LNE-4.6462247D 00 DSMP 3.8002087D-01 RSMP 1.1033125D 02
LIN 1.7595499D 02 LAN-3.2850014D 01 LAP-2.0273843D 02
GEOCENTRIC REFERENCE FLIGHT TIME 3.0773009D 05
X 6.6265468D 07 Y 3.2780841D 08 Z 1.7722316D 08
DX-2.9103632D 02 DY-8.1731962D 02 DZ-3.6772191D 02
R 3.7849374D 08 DEC 2.7919639D 01 RA 7.8571833D 01
V 9.4230192D 02 PTH-8.1118227D 01 AZ 5.7957403D 01
ALT 3.7212026D 08 LTGD 2.7922315D 01 LON 1.3633229D 02
VE 2.4282333D 04 PTE-2.1972930D 00 AZE-8.9817627D 01

TIME 4 APRIL 1968 7 HRS., 33 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 2.5208103D 07 YSC-2.5725452D 07 ZSC-1.2951609D 07
DXSC 6.7520545D 02 DYSC-8.6416003D 02 DZSC-4.2580452D 02
RSC 3.8275208D 07 DESC-1.9778275D 01 RASC-4.5581950D 01
VSC 1.1764287D 03 PTSC 8.3820391D 01 AZSC-1.0459902D 02
SELENOGRAPHIC REFERENCE
XSG 2.8147745D 07 YSG 2.5804284D 07 ZSG-2.6143643D 06
DXSG 1.0144806D 03 DYSG 6.2034994D 02 DZSG-7.7794105D 01
HSG 3.6537118D 07 LTSG-3.9166019D 00 LNSG 4.2512860D 01
VRSG 1.1916614D 03 PTSG 7.8956148D 01 AZSG-8.9473122D 01
LTS-1.4285931D-01 LNS 1.0570020D 02 LTE-6.2324314D 00
LNE-4.6585654D 00 DSMP 3.7907970D-01 RSMP 1.1021702D 02
LIN 1.7595876D 02 LAN-3.3198346D 01 LAP-2.0285463D 02
GEOCENTRIC REFERENCE FLIGHT TIME 3.0863009D 05
X 6.6002414D 07 Y 3.2707277D 08 Z 1.7689215D 08
DX-2.9350757D 02 DY-8.1744611D 02 DZ-3.6786781D 02
R 3.7765560D 08 DEC 2.7930188D 01 RA 7.8591079D 01
V 9.4323463D 02 PTH-8.0976683D 01 AZ 5.8407498D 01
ALT 3.7128212D 08 LTGD 2.7932871D 01 LON 1.3259127D 02
VE 2.4223334D 04 PTE-2.2039703D 00 AZE-8.9816447D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 7 HRS., 48 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 2.5814815D 07 YSC-2.6502410D 07 ZSC-1.3334444D 07
 DXSC 6.7306045D 02 DYSC-8.6243074D 02 DZSC-4.2494882D 02
 RSC 3.9326706D 07 DESC-1.9820126D 01 RASC-4.5752981D 01
 VSC 1.1736178D 03 PTSC 8.3955021D 01 AZSC-1.0455743D 02

SELENOGRAPHIC REFERENCE

XSG 2.9061341D 07 YSG 2.6359499D 07 ZSG-2.6842202D 06
 DXSG 1.0157394D 03 DYSG 6.1346964D 02 DZSG-7.7630825D 01
 HSG 3.7588616D 07 LTSG-3.9137310D 00 LNSG 4.2208959D 01
 VRSG 1.1891586D 03 PTSG 7.8944968D 01 AZSG-8.9489138D 01
 LTS-1.4265403D-01 LNS 1.0557310D 02 LTE-6.2385928D 00
 LNE-4.6703882D 00 DSMP 3.7813849D-01 RSMP 1.1010279D 02
 LIN 1.7596275D 02 LAN-3.3559766D 01 LAP-2.0297881D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.0953009D 05
 X 6.5737189D 07 Y 3.2633697D 08 Z 1.7656098D 08
 DX-2.9586402D 02 DY-8.1768809D 02 DZ-3.6807332D 02
 R 3.7681690D 08 DEC 2.7940802D 01 RA 7.8610775D 01
 V 9.4426018D 02 PTH-8.0842798D 01 AZ 5.8820978D 01
 ALT 3.7044343D 08 LTGD 2.7943492D 01 LON 1.2885070D 02
 VE 2.4164427D 04 PTE-2.2109219D 00 AZE-8.9815287D 01

TIME 4 APRIL 1968 8 HRS., 3 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 2.6419642D 07 YSC-2.7277860D 07 ZSC-1.3716534D 07
 DXSC 6.7101577D 02 DYSC-8.6080831D 02 DZSC-4.2414811D 02
 RSC 4.0376013D 07 DESC-1.9859807D 01 RASC-4.5915646D 01
 VSC 1.1709632D 03 PTSC 8.4081955D 01 AZSC-1.0451952D 02

SELENOGRAPHIC REFERENCE

XSG 2.9976110D 07 YSG 2.6908569D 07 ZSG-2.7539325D 06
 DXSG 1.0170839D 03 DYSG 6.0669350D 02 DZSG-7.7479451D 01
 HSG 3.8637923D 07 LTSG-3.9110177D 00 LNSG 4.1913278D 01
 VRSG 1.1868192D 03 PTSG 7.8926469D 01 AZSG-8.9505450D 01
 LTS-1.4244865D-01 LNS 1.0544600D 02 LTE-6.2447256D 00
 LNE-4.6831931D 00 DSMP 3.7719724D-01 RSMP 1.0998853D 02
 LIN 1.7596696D 02 LAN-3.3934620D 01 LAP-2.0311119D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.1043009D 05
 X 6.5469890D 07 Y 3.2560090D 08 Z 1.7622960D 08
 DX-2.9811539D 02 DY-8.1803756D 02 DZ-3.6833431D 02
 R 3.7597756D 08 DEC 2.7951481D 01 RA 7.8630904D 01
 V 9.4537209D 02 PTH-8.0716019D 01 AZ 5.9202220D 01
 ALT 3.6960409D 08 LTGD 2.7954177D 01 LON 1.2511057D 02
 VE 2.4105596D 04 PTE-2.2181342D 00 AZE-8.9814144D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 8 HRS., 18 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 2.7022671D 07 YSC-2.8051895D 07 ZSC-1.4097926D 07
 DXSC 6.6906274D 02 DYSC-8.5928554D 02 DZSC-4.2339868D 02
 RSC 4.1423243D 07 DESC-1.9897500D 01 RASC-4.6070606D 01
 VSC 1.1684533D 03 PTSC 8.4201741D 01 AZSC-1.0448510D 02

SELENOGRAPHIC REFERENCE

XSG 3.0892124D 07 YSG 2.7451585D 07 ZSG-2.8235113D 06
 DXSG 1.0185072D 03 DYSG 6.0001177D 02 DZSG-7.7339167D 01
 HSG 3.9685153D 07 LTSG-3.9084532D 00 LNSG 4.1625164D 01
 VRSG 1.1846317D 03 PTSG 7.8901190D 01 AZSG-8.9521998D 01
 LTS-1.4224318D-01 LNS 1.0531890D 02 LTE-6.2508296D 00
 LNE-4.6954800D 00 DSMP 3.7625595D-01 RSMP 1.0987427D 02
 LIN 1.7597137D 02 LAN-3.4323247D 01 LAP-2.0325200D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.1133009D 05
 X 6.5200610D 07 Y 3.2486447D 08 Z 1.7589796D 08
 DX-3.0027035D 02 DY-8.1848732D 02 DZ-3.6864709D 02
 R 3.7513749D 08 DEC 2.7962222D 01 RA 7.8651451D 01
 V 9.4656455D 02 PTH-8.0595844D 01 AZ 5.9554934D 01
 ALT 3.6876402D 08 LTGD 2.7964925D 01 LON 1.2137085D 02
 VE 2.4046825D 04 PTE-2.2255956D 00 AZE-8.9813016D 01

TIME 4 APRIL 1968 8 HRS., 33 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 2.7623980D 07 YSC-2.8824602D 07 ZSC-1.4478666D 07
 DXSC 6.6719363D 02 DYSC-8.5785597D 02 DZSC-4.2269722D 02
 RSC 4.2468502D 07 DESC-1.9933370D 01 RASC-4.6218454D 01
 VSC 1.1660777D 03 PTSC 8.4314871D 01 AZSC-1.0445400D 02

SELENOGRAPHIC REFERENCE

XSG 3.1809452D 07 YSG 2.7988626D 07 ZSG-2.8929663D 06
 DXSG 1.0200030D 03 DYSG 5.9341568D 02 DZSG-7.7209244D 01
 HSG 4.0730413D 07 LTSG-3.9060293D 00 LNSG 4.1344027D 01
 VRSG 1.1825860D 03 PTSG 7.8869621D 01 AZSG-8.9538727D 01
 LTS-1.4203761D-01 LNS 1.0519181D 02 LTE-6.2569050D 00
 LNE-4.7077488D 00 DSMP 3.7531462D-01 RSMP 1.0975999D 02
 LIN 1.7597599D 02 LAN-3.4725978D 01 LAP-2.0340149D 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.1223009D 05
 X 6.4929430D 07 Y 3.2412760D 08 Z 1.7556602D 08
 DX-3.0233662D 02 DY-8.1903090D 02 DZ-3.6900833D 02
 R 3.7429662D 08 DEC 2.7973026D 01 RA 7.8672403D 01
 V 9.4783237D 02 PTH-8.0481813D 01 AZ 5.9882286D 01
 ALT 3.6792315D 08 LTGD 2.7975736D 01 LON 1.1763153D 02
 VE 2.3988100D 04 PTE-2.2332953D 00 AZE-8.9811900D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPURTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 8 HRS., 48 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 2.8223643D 07 YSC-2.9596062D 07 ZSC-1.4858795D 07
 DXSC 6.6540151D 02 DYSC-8.5651374D 02 DZSC-4.2204072D 02
 RSC 4.3511891D 07 DESC-1.9967564D 01 RASC-4.6359725D 01
 VSC 1.1638270D 03 PTSC 8.4421790D 01 AZSC-1.0442607D 02

SELENOGRAPHIC REFERENCE

XSG 3.2728158D 07 YSG 2.8519766D 07 ZSG-2.9623066D 06
 DXSG 1.0215658D 03 DYSG 5.8689740D 02 DZSG-7.7089030D 01
 HSG 4.1773801D 07 LTSG-3.9037385D 00 LNSG 4.1069339D 01
 VRSG 1.1806727D 03 PTSG 7.8832202D 01 AZSG-8.9555590D 01
 LTS-1.4183194D-01 LNS 1.0506471D 02 LTE-6.2629516D 00
 LNE-4.7199995D 00 DSMP 3.7437325D-01 RSMP 1.0964569D 02
 LIN 1.7598081D 02 LAN-3.5143134D 01 LAP-2.0355987D 02
 FLIGHT TIME 3.1313009D 05

GEOCENTRIC REFERENCE

X 6.4656428D 07 Y 3.2339019D 08 Z 1.7523373D 08
 DX-3.0432115D 02 DY-8.1966244D 02 DZ-3.6941504D 02
 R 3.7345486D 08 DEC 2.7983892D 01 RA 7.8693745D 01
 V 9.4917087D 02 PTH-8.0373508D 01 AZ 6.0186993D 01
 ALT 3.6708140D 08 LTGD 2.7986608D 01 LON 1.1389261D 02
 VE 2.3929409D 04 PTE-2.2412238D 00 AZE-8.9810796D 01

TIME 4 APRIL 1968 9 HRS., 3 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 2.8821724D 07 YSC-3.0366351D 07 ZSC-1.5238352D 07
 DXSC 6.6368015D 02 DYSC-8.5525358D 02 DZSC-4.2142649D 02
 RSC 4.4553500D 07 DESC-2.0000214D 01 RASC-4.6494902D 01
 VSC 1.1616929D 03 PTSC 8.4522900D 01 AZSC-1.0440117D 02

SELENOGRAPHIC REFERENCE

XSG 3.3648298D 07 YSG 2.9045072D 07 ZSG-3.0315406D 06
 DXSG 1.0231903D 03 DYSG 5.8044985D 02 DZSG-7.6977935D 01
 HSG 4.2815411D 07 LTSG-3.9015741D 00 LNSG 4.0800623D 01
 VRSG 1.1788834D 03 PTSG 7.8789329D 01 AZSG-8.9572547D 01
 LTS-1.4162618D-01 LNS 1.0493761D 02 LTE-6.2689694D 00
 LNE-4.7322319D 00 DSMP 3.7343184D-01 RSMP 1.0953138D 02
 LIN 1.7598582D 02 LAN-3.5575024D 01 LAP-2.0372736D 02
 FLIGHT TIME 3.1403009D 05

GEOCENTRIC REFERENCE

X 6.4381675D 07 Y 3.2265218D 08 Z 1.7490106D 08
 DX-3.0623014D 02 DY-8.2037665D 02 DZ-3.8986450D 02
 R 3.7261215D 08 DEC 2.7994819D 01 RA 7.8715466D 01
 V 9.5057588D 02 PTH-8.0270543D 01 AZ 6.0471398D 01
 ALT 3.6623869D 08 LTGD 2.7997542D 01 LON 1.1015406D 02
 VE 2.3870740D 04 PTE-2.2493726D 00 AZE-8.9809703D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 9 HRS., 18 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 2.94182860 07 YSC-3.11355410 07 ZSC-1.56173740 07
DXSC 6.62023940 02 DYSC-8.54070690 02 DZSC-4.20852080 02
RSC 4.55934190 07 DESC-2.00314380 01 RASC-4.66244210 01
VSC 1.15966760 03 PTSC 8.46185680 01 AZSC-1.04379170 02

SELENOGRAPHIC REFERENCE

XSG 3.45699260 07 YSG 2.95646050 07 ZSG-3.10067630 06
DXSG 1.02487190 03 DYSG 5.74066640 02 DZSG-7.68754320 01
HSG 4.38553300 07 LTSG-3.89952950 00 LNSG 4.05374470 01
VRSG 1.17721060 03 PTSG 7.87413660 01 AZSG-8.95895600 01
LTS-1.41420320-01 LNS 1.04810520 02 LTE-6.27495840 00
LNE-4.74444600 00 DSMP 3.72490390-01 RSMP 1.09417050 02
LIN 1.75991000 02 LAN-3.60219470 01 LAP-2.03904170 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.14930090 05
X 6.41052350 07 Y 3.21913490 08 Z 1.74567970 08
DX-3.08069220 02 DY-8.21168720 02 DZ-3.70354260 02
R 3.71758410 08 DEC 2.80058060 01 RA 7.87375560 01
V 9.52043590 02 PTH-8.01725690 01 AZ 6.07375340 01
ALT 3.65394960 08 LTGD 2.80085360 01 LON 1.06415890 02
VE 2.38120830 04 PTE-2.25773400 00 AZE-8.98086170 01

TIME 4 APRIL 1968 9 HRS., 33 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 3.00133850 07 YSC-3.19037000 07 ZSC-1.59958970 07
DXSC 6.60427810 02 DYSC-8.52960700 02 DZSC-4.20315250 02
RSC 4.66317280 07 DESC-2.00613430 01 RASC-4.67486820 01
VSC 1.15774430 03 PTSC 8.47091240 01 AZSC-1.04359970 02

SELENOGRAPHIC REFERENCE

XSG 3.54930920 07 YSG 3.00784200 07 ZSG-3.16972120 06
DXSG 1.02660650 03 DYSG 5.67741980 02 DZSG-7.67810430 01
HSG 4.48936390 07 LTSG-3.89759900 00 LNSG 4.02794180 01
VRSG 1.17564760 03 PTSG 7.86886410 01 AZSG-8.96066000 01
LTS-1.41214360-01 LNS -1.04683420 02 LTE-6.28091860 00
LNE-4.75664160 00 DSMP 3.71548900-01 RSMP 1.09302710 02
LIN 1.75996360 02 LAN-3.64841880 01 LAP-2.04090480 02

GEOCENTRIC REFERENCE

FLIGHT TIME 3.15830090 05
X 6.38271700 07 Y 3.21174050 08 Z 1.74234410 08
DX-3.09843440 02 DY-8.22034290 02 DZ-3.70882080 02
R 3.70923590 08 DEC 2.80168530 01 RA 7.87600040 01
V 9.53570580 02 PTH-8.00792620 01 AZ 6.09871740 01
ALT 3.64550140 08 LTGD 2.80195900 01 LON 1.02678070 02
VE 2.37534270 04 PTE-2.26630120 00 AZE-8.98075400 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPURTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 9 HRS., 48 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 3.0607073D 07 YSC-3.2670891D 07 ZSC-1.6373952D 07
 DXSC 6.5888718D 02 DYSC-8.5191964D 02 DZSC-4.1981398D 02
 RSC 4.7668505D 07 DESC-2.0090027D 01 RASC-4.6868044D 01
 VSC 1.1559166D 03 PTSC 8.4794871D 01 AZSC-1.0434345D 02
 SELENOGRAPHIC REFERENCE
 XSG 3.6417842D 07 YSG 3.0586567D 07 ZSG-3.2386823D 06
 DXSG 1.0283901D 03 DYSG 5.6147062D 02 DZSG-7.6694336D 01
 HSG 4.5930415D 07 LTSG-3.8957773D 00 LNSG 4.0026180D 01
 VRSG 1.1741880D 03 PTSG 7.8631455D 01 AZSG-8.9623640D 01
 LTS-1.4100831D-01 LNS 1.0455633D 02 LTE-6.2868498D 00
 LNE-4.7688188D 00 DSMP 3.7060737D-01 RSMP 1.0918836D 02
 LIN 1.7600188D 02 LAN-3.6962019D 01 LAP-2.0428650D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 3.1673009D 05
 X 6.3547535D 07 Y 3.2043381D 08 Z 1.7390037D 08
 DX-3.1155739D 02 DY-8.2296937D 02 DZ-3.7144595D 02
 R 3.7007763D 08 DEC 2.8027960D 01 RA 7.8782802D 01
 V 9.5515375D 02 PTH-7.9990326D 01 AZ 6.1221870D 01
 ALT 3.6370418D 08 LTGD 2.8030704D 01 LON 9.8940598D 01
 VE 2.3694765D 04 PTE-2.2750680D 00 AZE-8.9806469D 01

TIME 4 APRIL 1968 10 HRS., 3 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC 3.1199398D 07 YSC-3.3437175D 07 ZSC-1.6751572D 07
 DXSC 6.5739785D 02 DYSC-8.5094389D 02 DZSC-4.1934643D 02
 RSC 4.8703822D 07 DESC-2.0117577D 01 RASC-4.6982838D 01
 VSC 1.1541789D 03 PTSC 8.4876087D 01 AZSC-1.0432952D 02
 SELENOGRAPHIC REFERENCE
 XSG 3.7344217D 07 YSG 3.1089093D 07 ZSG-3.3075665D 06
 DXSG 1.0302192D 03 DYSG 5.5524777D 02 DZSG-7.6614919D 01
 HSG 4.6965732D 07 LTSG-3.8940592D 00 LNSG 3.9777408D 01
 VRSG 1.1728263D 03 PTSG 7.8570081D 01 AZSG-8.9640655D 01
 LTS-1.4080215D-01 LNS 1.0442923D 02 LTE-6.2927521D 00
 LNE-4.7809775D 00 DSMP 3.6966580D-01 RSMP 1.0907399D 02
 LIN 1.7600753D 02 LAN-3.7455696D 01 LAP-2.0449240D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 3.1763009D 05
 X 6.3266383D 07 Y 3.1969269D 08 Z 1.7356580D 08
 DX-3.1321525D 02 DY-8.2397034D 02 DZ-3.7204401D 02
 R 3.6923047D 08 DEC 2.8039126D 01 RA 7.8805941D 01
 V 9.5679029D 02 PTH-7.9905487D 01 AZ 6.1442985D 01
 ALT 3.6285702D 08 LTGD 2.8041877D 01 LON 9.5203471D 01
 VE 2.3636088D 04 PTE-2.2840288D 00 AZE-8.9805403D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - FIRST OPPORTUNITY (CONTINUED)

TIME 4 APRIL 1968 10 HRS., 18 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 3.1790404D 07 YSC-3.4202609D 07 ZSC-1.7128786D 07
 DXSC 6.5595605D 02 DYSC-8.5003013D 02 DZSC-4.1891091D 02
 RSC 4.9737747D 07 DESC-2.0144075D 01 RASC-4.7093366D 01
 VSC 1.1525259D 03 PTSC 8.4953023D 01 AZSC-1.0431810D 02

SELENOGRAPHIC REFERENCE

XSG 3.8272259D 07 YSG 3.1586038D 07 ZSG-3.3763801D 06
 DXSG 1.0320906D 03 DYSG 5.4906905D 02 DZSG-7.6542436D 01
 HSG 4.7999658D 07 LTSG-3.8924402D 00 LNSG 3.9532804D 01
 VRSG 1.1715573D 03 PTSG 7.8504772D 01 AZSG-8.9657626D 01
 LTS-1.4059589D-01 LNS 1.0430214D 02 LTE-6.2986254D 00
 LNE-4.7931175D 00 DSMP 3.6872419D-01 RSMP 1.0895960D 02
 LIN 1.7601332D 02 LAN-3.7965458D 01 LAP-2.0470835D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 3.1853009D 05

X 6.2983763D 07 Y 3.1895064D 08 Z 1.7323068D 08
 DX-3.1482082D 02 DY-8.2503385D 02 DZ-3.7267457D 02
 R 3.6838205D 08 DEC 2.8050352D 01 RA 7.8829413D 01
 V 9.5847762D 02 PTH-7.9824496D 01 AZ 6.1651725D 01
 ALT 3.6200861D 08 LTGD 2.8053109D 01 LON 9.1466676D 01
 VE 2.3577387D 04 PTE-2.2931786D 00 AZE-8.9804341D 01

TIME 4 APRIL 1968 10 HRS., 33 MIN., 16.634 SEC., GMT

SELENOCENTRIC REFERENCE

XSC 3.2380132D 07 YSC-3.4967247D 07 ZSC-1.7505621D 07
 DXSC 6.5455830D 02 DYSC-8.4917532D 02 DZSC-4.1850589D 02
 RSC 5.0770346D 07 DESC-2.0169593D 01 RASC-4.7199904D 01
 VSC 1.1509529D 03 PTSC 8.5025912D 01 AZSC-1.0430909D 02

SELENOGRAPHIC REFERENCE

XSG 3.9202002D 07 YSG 3.2077440D 07 ZSG-3.4451292D 06
 DXSG 1.0340013D 03 DYSG 5.4293048D 02 DZSG-7.6476564D 01
 HSG 4.9032257D 07 LTSG-3.8909160D 00 LNSG 3.9292097D 01
 VRSG 1.1703764D 03 PTSG 7.8435757D 01 AZSG-8.9674535D 01
 LTS-1.4038953D-01 LNS 1.0417505D 02 LTE-6.3044697D 00
 LNE-4.8052387D 00 DSMP 3.6778254D-01 RSMP 1.0884520D 02
 LIN 1.7601921D 02 LAN-3.8491527D 01 LAP-2.0493448D 02
 GEOCENTRIC REFERENCE FLIGHT TIME 3.1943009D 05

X 6.2699721D 07 Y 3.1820761D 08 Z 1.7289498D 08
 DX-3.1637755D 02 DY-8.2615689D 02 DZ-3.7333608D 02
 R 3.6753233D 08 DEC 2.8061636D 01 RA 7.8853212D 01
 V 9.6021341D 02 PTH-7.9747120D 01 AZ 6.1849155D 01
 ALT 3.6115889D 08 LTGD 2.8064401D 01 LON 8.7730209D 01
 VE 2.3518656D 04 PTE-2.3025131D 00 AZE-8.9803283D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 10 HRS., 48 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 3.2968621D 07 YSC-3.5731141D 07 ZSC-1.7882105D 07
 DXSC 6.5320143D 02 DYSC-8.4837669D 02 DZSC-4.1812995D 02
 RSC 5.1801680D 07 DESC-2.0194198D 01 RASC-4.7302706D 01
 VSC 1.1494554D 03 PTSC 8.5094967D 01 AZSC-1.0430243D 02

SELENOGRAPHIC REFERENCE

XSG 4.0133482D 07 YSG 3.2563335D 07 ZSG-3.5138196D 06
 DXSG 1.0359486D 03 DYSG 5.3682837D 02 DZSG-7.6417009D 01
 HSG 5.0063591D 07 LTSG-3.8894826D 00 LNSG 3.9055036D 01
 VRSG 1.1692791D 03 PTSG 7.8363250D 01 AZSG-8.9691369D 01
 LTS-1.4018307D-01 LNS 1.0404795D 02 LTE-6.3102850D 00
 LNE-4.8173412D 00 DSMP 3.6684085D-01 RSMP 1.0873079D 02
 LIN 1.7602520D 02 LAN-3.9034104D 01 LAP-2.0517095D 02

GEOCENTRIC REFERENCE

X 6.2414298D 07 Y 3.1746354D 08 Z 1.7255866D 08
 DX-3.1788860D 02 DY-8.2733664D 02 DZ-3.7402714D 02
 R 3.6663125D 08 DEC 2.8072978D 01 RA 7.8877330D 01
 V 9.6199552D 02 PTH-7.9673144D 01 AZ 6.2036226D 01
 ALT 3.6030781D 08 LTGD 2.8075750D 01 LON 8.3994060D 01
 VE 2.3459888D 04 PTE-2.3120281D 00 AZE-8.9802228D 01

TIME 4 APRIL 1968 11 HRS., 3 MIN., 16.634 SEC., GMT
 SELENOCENTRIC REFERENCE

XSC 3.3555906D 07 YSC-3.6494341D 07 ZSC-1.8258263D 07
 DXSC 6.5188254D 02 DYSC-8.4763166D 02 DZSC-4.1778180D 02
 RSC 5.2831808D 07 DESC-2.0217952D 01 RASC-4.7402006D 01
 VSC 1.1480296D 03 PTSC 8.5160385D 01 AZSC-1.0429805D 02

SELENOGRAPHIC REFERENCE

XSG 4.1066730D 07 YSG 3.3043753D 07 ZSG-3.5824569D 06
 DXSG 1.0379299D 03 DYSG 5.3075937D 02 DZSG-7.6363500D 01
 HSG 5.1093718D 07 LTSG-3.8881364D 00 LNSG 3.8821392D 01
 VRSG 1.1682617D 03 PTSG 7.8287446D 01 AZSG-8.9708115D 01
 LTS-1.3997651D-01 LNS 1.0392086D 02 LTE-6.3160712D 00
 LNE-4.8294248D 00 DSMP 3.6589912D-01 RSMP 1.0861636D 02
 LIN 1.7603125D 02 LAN-3.9593370D 01 LAP-2.0541787D 02

GEOCENTRIC REFERENCE

X 6.2127534D 07 Y 3.1671839D 08 Z 1.7222172D 08
 DX-3.1935689D 02 DY-8.2857054D 02 DZ-3.7474645D 02
 R 3.6582877D 08 DEC 2.8084379D 01 RA 7.8901763D 01
 V 9.6382201D 02 PTH-7.9602371D 01. AZ 6.2213782D 01
 ALT 3.5945534D 08 LTGD 2.8087159D 01 LON 8.0258226D 01
 VE 2.3401077D 04 PTE-2.3217202D 00 AZE-8.9801175D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 4 APRIL 1968 11 HRS., 18 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 3.4142020D 07 YSC-3.7256894D 07 ZSC-1.8634120D 07
DXSC 6.5059897D 02 DYSC-8.4693789D 02 DZSC-4.1746025D 02
RSC 5.3860784D 07 DESC-2.0240910D 01 RASC-4.7498019D 01
VSC 1.1466716D 03 PTSC 8.5222346D 01 AZSC-1.0429586D 02
SELENOGRAPHIC REFERENCE
XSG 4.2001776D 07 YSG 3.3518723D 07 ZSG-3.6510464D 06
DXSG 1.0399430D 03 DYSG 5.2472036D 02 DZSG-7.6315794D 01
HSG 5.2122695D 07 LTSG-3.8868739D 00 LNSG 3.8590953D 01
VRSG 1.1673205D 03 PTSG 7.8208526D 01 AZSG-8.9724762D 01
LTS-1.3976985D-01 LNS 1.0379377D 02 LTE-6.3218283D 00
LNE-4.8414894D 00 DSMP 3.6495735D-01 RSMP 1.0850191D 02
LIN 1.7603735D 02 LAN-4.0169484D 01 LAP-2.0567535D 02
GEOCENTRIC REFERENCE FLIGHT TIME 3.2213009D 05
X 6.1839467D 07 Y 3.1597210D 08 Z 1.7188411D 08
DX-3.2078507D 02 DY-8.2985623D 02 DZ-3.7549280D 02
R 3.6497484D 08 DEC 2.8095839D 01 RA 7.8926503D 01
V 9.6569109D 02 PTH-7.9534616D 01 AZ 6.2382583D 01
ALT 3.5860141D 08 LTGD 2.8098625D 01 LON 7.6522700D 01
VE 2.3342217D 04 PTE-2.3315861D 00 AZE-8.9800123D 01

TIME 4 APRIL 1968 11 HRS., 33 MIN., 16.634 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 3.4726994D 07 YSC-3.8018844D 07 ZSC-1.9009699D 07
DXSC 6.4934827D 02 DYSC-8.4629320D 02 DZSC-4.1716420D 02
RSC 5.4888662D 07 DESC-2.0263125D 01 RASC-4.7590943D 01
VSC 1.1453782D 03 PTSC 8.5281017D 01 AZSC-1.0429583D 02
SELENOGRAPHIC REFERENCE
XSG 4.2938647D 07 YSG 3.3938270D 07 ZSG-3.7195933D 06
DXSG 1.0419857D 03 DYSG 5.1870849D 02 DZSG-7.6273664D 01
HSG 5.3150573D 07 LTSG-3.8856920D 00 LNSG 3.8363525D 01
VRSG 1.1664521D 03 PTSG 7.3126658D 01 AZSG-8.9741302D 01
LTS-1.3956308D-01 LNS 1.0366668D 02 LTE-6.3275563D 00
LNE-4.8535350D 00 DSMP 3.6401555D-01 RSMP 1.0838745D 02
LIN 1.7604348D 02 LAN-4.0762579D 01 LAP-2.0594346D 02
GEOCENTRIC REFERENCE FLIGHT TIME 3.2303009D 05
X 6.1550132D 07 Y 3.1522463D 08 Z 1.7154582D 08
DX-3.2217560D 02 DY-8.3119154D 02 DZ-3.7626511D 02
R 3.6411943D 08 DEC 2.8107357D 01 RA 7.8951546D 01
V 9.6760112D 02 PTH-7.9469709D 01 AZ 6.2543308D 01
ALT 3.5774600D 08 LTGD 2.8110150D 01 LON 7.2787477D 01
VE 2.3283302D 04 PTE-2.3416231D 00 AZE-8.9799072D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 11 HRS., 48 MIN., 16.634 SEC.,GMT
 SELENOCENTRIC REFERENCE

XSC 3.5310856D 07 YSC-3.8730235D 07 ZSC-1.9385023D 07
 DXSC 6.4812817D 02 DYSC-8.4569560D 02 DZSC-4.1689266D 02
 RSC 5.5915493D 07 DESC-2.0284644D 01 RASC-4.7680964D 01
 VSC 1.1441463D 03 PTSC 8.5336553D 01 AZSC-1.0429787D 02

SELENOGRAPHIC REFERENCE

XSG 4.3877369D 07 YSG 3.4452418D 07 ZSG-3.7881023D 06
 DXSG 1.0440561D 03 DYSG 5.1272111D 02 DZSG-7.6236907D 01
 HSG 5.4177403D 07 LTSG-3.8845876D 00 LNSG 3.8138926D 01
 VRSG 1.1656535D 03 PTSG 7.8041996D 01 AZSG-8.9757729D 01
 LTS-1.3935621D-01 LNS 1.0353959D 02 LTE-6.3332550D 00
 LNE-4.8655614D 00 DSMP 3.6307370D-01 RSMP 1.0827297D 02
 LIN 1.7604960D 02 LAN-4.1372764D 01 LAP-2.0622227D 02

GEOCENTRIC REFERENCE

X 6.1259562D 07 Y 3.1447594D 08 Z 1.7120683D 08
 DX-3.2353072D 02 DY-8.3257445D 02 DZ-3.7706237D 02
 R 3.6326248D 08 DEC 2.8118932D 01 RA 7.8976888D 01
 V 9.6955060D 02 PTH-7.9407491D 01 AZ 6.2696570D 01
 ALT 3.5688906D 08 LTGD 2.8121734D 01 LON 6.9052552D 01
 VE 2.3224328D 04 PTE-2.3518285D 00 AZE-8.9798021D 01

TIME 4 APRIL 1968 12 HRS., 3 MIN., 16.634 SEC.,GMT
 SELENOCENTRIC REFERENCE

XSC 3.5893633D 07 YSC-3.9541110D 07 ZSC-1.9760113D 07
 DXSC 6.4693659D 02 DYSC-8.4514324D 02 DZSC-4.1664468D 02
 RSC 5.6941323D 07 DESC-2.0305511D 01 RASC-4.7768249D 01
 VSC 1.1429728D 03 PTSC 8.5389098D 01 AZSC-1.0430194D 02

SELENOGRAPHIC REFERENCE

XSG 4.4817967D 07 YSG 3.4911187D 07 ZSG-3.8565784D 06
 DXSG 1.0461522D 03 DYSG 5.0675576D 02 DZSG-7.6205332D 01
 HSG 5.5203234D 07 LTSG-3.8835581D 00 LNSG 3.7916990D 01
 VRSG 1.1649219D 03 PTSG 7.7954684D 01 AZSG-8.9774036D 01
 LTS-1.3914923D-01 LNS 1.0341250D 02 LTE-6.3389246D 00
 LNE-4.8775686D 00 DSMP 3.6213181D-01 RSMP 1.0815847D 02
 LIN 1.7605570D 02 LAN-4.2000118D 01 LAP-2.0651183D 02

GEOCENTRIC REFERENCE

X 6.0967787D 07 Y 3.1372598D 08 Z 1.7086710D 08
 DX-3.2485252D 02 DY-8.3400310D 02 DZ-3.7788363D 02
 R 3.6240396D 08 DEC 2.8130567D 01 RA 7.9002524D 01
 V 9.7153815D 02 PTH-7.9347816D 01 AZ 6.2842920D 01
 ALT 3.5603054D 08 LTGD 2.8133375D 01 LON 6.5317921D 01
 VE 2.3165289D 04 PTE-2.3622002D 00 AZE-8.9796970D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 12 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.2573009D 05 |
| X | 6.0674837D 07 | Y | 3.1297472D 08 | Z | 1.7052663D 08 |
| DX | -3.2614292D 02 | DY | -8.3547579D 02 | DZ | -3.7872804D 02 |
| R | 3.6154383D 08 | DEC | 2.8142259D 01 | RA | 7.9028450D 01 |
| V | 9.7356250D 02 | PTH | -7.9290544D 01 | AZ | 6.2982861D 01 |
| ALT | 3.5517042D 08 | LTGD | 2.8145075D 01 | LON | 6.1583581D 01 |
| VE | 2.3106181D 04 | PTE | -2.3727362D 00 | AZE | -8.9795918D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 12 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.2753009D 05 |
| X | 6.0085518D 07 | Y | 3.1146812D 08 | Z | 1.6984335D 08 |
| DX | -3.2863653D 02 | DY | -8.3854708D 02 | DZ | -3.8048321D 02 |
| R | 3.5981860D 08 | DEC | 2.8165819D 01 | RA | 7.9081157D 01 |
| V | 9.7771706D 02 | PTH | -7.9182713D 01 | AZ | 6.3245281D 01 |
| ALT | 3.5344520D 08 | LTGD | 2.8168650D 01 | LUN | 5.4115755D 01 |
| VE | 2.2987739D 04 | PTE | -2.3942946D 00 | AZE | -8.9793809D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 13 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.2933009D 05 |
| X | 5.9491809D 07 | Y | 3.0995586D 08 | Z | 1.6915684D 08 |
| DX | -3.3102431D 02 | DY | -8.4177691D 02 | DZ | -3.8232220D 02 |
| R | 3.5808651D 08 | DEC | 2.8189612D 01 | RA | 7.9134985D 01 |
| V | 9.8200597D 02 | PTH | -7.9083070D 01 | AZ | 6.3486995D 01 |
| ALT | 3.5171311D 08 | LTGD | 2.8192458D 01 | LUN | 4.6649050D 01 |
| VE | 2.2868971D 04 | PTE | -2.4164928D 00 | AZE | -8.9791690D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 13 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.3113009D 05 |
| X | 5.8893888D 07 | Y | 3.0843764D 08 | Z | 1.6846695D 08 |
| DX | -3.3331730D 02 | DY | -8.4515552D 02 | DZ | -3.8424014D 02 |
| R | 3.5634727D 08 | DEC | 2.8213640D 01 | RA | 7.9189912D 01 |
| V | 9.8642220D 02 | PTH | -7.8990802D 01 | AZ | 6.3710641D 01 |
| ALT | 3.4997388D 08 | LTGD | 2.8216502D 01 | LON | 3.9183443D 01 |
| VE | 2.2749847D 04 | PTE | -2.4393231D 00 | AZE | -8.9789559D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 14 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.3293009D 05 |
| X | 5.8291918D 07 | Y | 3.0691321D 08 | Z | 1.6777353D 08 |
| DX | -3.3552507D 02 | DY | -8.4867446D 02 | DZ | -3.8623286D 02 |
| R | 3.5460066D 08 | DEC | 2.8237905D 01 | RA | 7.9245919D 01 |
| V | 9.9095976D 02 | PTH | -7.8905197D 01 | AZ | 6.3918436D 01 |
| ALT | 3.4822727D 08 | LTGD | 2.8240783D 01 | LON | 3.1718918D 01 |
| VE | 2.2630340D 04 | PTE | -2.4627804D 00 | AZE | -8.9787412D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 14 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.3473009D 05 |
| X | 5.7686044D 07 | Y | 3.0538233D 08 | Z | 1.6707647D 08 |
| DX | -3.3765600D 02 | DY | -8.5232646D 02 | DZ | -3.8829679D 02 |
| R | 3.5284642D 08 | DEC | 2.8262408D 01 | RA | 7.9302993D 01 |
| V | 9.9561356D 02 | PTH | -7.8825624D 01 | AZ | 6.4112256D 01 |
| ALT | 3.4647304D 08 | LTGD | 2.8265302D 01 | LON | 2.4255459D 01 |
| VE | 2.2510426D 04 | PTE | -2.4868624D 00 | AZE | -8.9785246D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 15 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.3653009D 05 |
| X | 5.7076398D 07 | Y | 3.0384476D 08 | Z | 1.6637562D 08 |
| DX | -3.3971745D 02 | DY | -8.5610519D 02 | DZ | -3.9042883D 02 |
| R | 3.5108432D 08 | DEC | 2.8287152D 01 | RA | 7.9361122D 01 |
| V | 1.0003793D 03 | PTH | -7.8751523D 01 | AZ | 6.4293702D 01 |
| ALT | 3.4471095D 08 | LTGD | 2.8290061D 01 | LON | 1.6793055D 01 |
| VE | 2.2390081D 04 | PTE | -2.5115687D 00 | AZE | -8.9783060D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 15 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.3833009D 05 |
| X | 5.6463099D 07 | Y | 3.0230028D 08 | Z | 1.6567088D 08 |
| DX | -3.4171587D 02 | DY | -8.6000521D 02 | DZ | -3.9262634D 02 |
| R | 3.4931416D 08 | DEC | 2.8312137D 01 | RA | 7.9420298D 01 |
| V | 1.0052533D 03 | PTH | -7.8682398D 01 | AZ | 6.4464148D 01 |
| ALT | 3.4294080D 08 | LTGD | 2.8315064D 01 | LON | 9.8316970D 00 |
| VE | 2.2269285D 04 | PTE | -2.5369011D 00 | AZE | -8.9780849D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 16 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.4013009D 05 |
| X | 5.5846255D 07 | Y | 3.0074867D 08 | Z | 1.6496213D 08 |
| DX | -3.4365699D 02 | DY | -8.6402176D 02 | DZ | -3.9488705D 02 |
| R | 3.4753571D 08 | DEC | 2.8337368D 01 | RA | 7.9480513D 01 |
| V | 1.0102324D 03 | PTH | -7.8617803D 01 | AZ | 6.4624778D 01 |
| ALT | 3.4116236D 08 | LTGD | 2.8340311D 01 | LON | 1.8713794D 00 |
| VE | 2.2148018D 04 | PTE | -2.5628629D 00 | AZE | -8.9778613D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 16 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.4193009D 05 |
| X | 5.5225965D 07 | Y | 2.9918973D 08 | Z | 1.6424925D 08 |
| DX | -3.4554590D 02 | DY | -8.6815078D 02 | DZ | -3.9720902D 02 |
| R | 3.4574878D 08 | DEC | 2.8362847D 01 | RA | 7.9541765D 01 |
| V | 1.0153141D 03 | PTH | -7.8557342D 01 | AZ | 6.4776621D 01 |
| ALT | 3.3937544D 08 | LTGD | 2.8365807D 01 | LON | 3.5441206D 02 |
| VE | 2.2026260D 04 | PTE | -2.5894594D 00 | AZE | -8.9776349D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 17 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.4373009D 05 |
| X | 5.4602318D 07 | Y | 2.9762326D 08 | Z | 1.6353214D 08 |
| DX | -3.4738712D 02 | DY | -8.7238874D 02 | DZ | -3.9959059D 02 |
| R | 3.4395317D 08 | DEC | 2.8388578D 01 | RA | 7.9604051D 01 |
| V | 1.0204962D 03 | PTH | -7.8500655D 01 | AZ | 6.4920573D 01 |
| ALT | 3.3757983D 08 | LTGD | 2.8391555D 01 | LON | 3.4695381D 02 |
| VE | 2.1903995D 04 | PTE | -2.6166970D 00 | AZE | -8.9774055D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 17 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.4553009D 05 |
| X | 5.3975397D 07 | Y | 2.9604907D 08 | Z | 1.6281069D 08 |
| DX | -3.4918470D 02 | DY | -8.7673262D 02 | DZ | -4.0203037D 02 |
| R | 3.4214868D 08 | DEC | 2.8414562D 01 | RA | 7.9667370D 01 |
| V | 1.0257770D 03 | PTH | -7.8447421D 01 | AZ | 6.5057422D 01 |
| ALT | 3.3577535D 08 | LTGD | 2.8417557D 01 | LON | 3.3949660D 02 |
| VE | 2.1781206D 04 | PTE | -2.6445838D 00 | AZE | -8.9771728D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 18 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.4733009D 05 |
| X | 5.3345277D 07 | Y | 2.9446696D 08 | Z | 1.6208480D 08 |
| DX | -3.5094227D 02 | DY | -8.8117982D 02 | DZ | -4.0452720D 02 |
| R | 3.4033512D 08 | DEC | 2.8440805D 01 | RA | 7.9731725D 01 |
| V | 1.0311550D 03 | PTH | -7.8397348D 01 | AZ | 6.5187859D 01 |
| ALT | 3.3396180D 08 | LTGD | 2.8443817D 01 | LON | 3.2204042D 02 |
| VE | 2.1657877D 04 | PTE | -2.6731293D 00 | AZE | -8.9769366D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 18 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.4913009D 05 |
| X | 5.2712027D 07 | Y | 2.9287676D 08 | Z | 1.6135436D 08 |
| DX | -3.5266309D 02 | DY | -8.8572817D 02 | DZ | -4.0708010D 02 |
| R | 3.3851231D 08 | DEC | 2.8467309D 01 | RA | 7.9797119D 01 |
| V | 1.0366291D 03 | PTH | -7.8350172D 01 | AZ | 6.5312497D 01 |
| ALT | 3.3213900D 08 | LTGD | 2.8470339D 01 | LON | 3.2458528D 02 |
| VE | 2.1533991D 04 | PTE | -2.7023440D 00 | AZE | -8.9766969D 01 |

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|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 19 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.5093009D 05 |
| X | 5.2075710D 07 | Y | 2.9127828D 08 | Z | 1.6061928D 08 |
| DX | -3.5435010D 02 | DY | -8.9037582D 02 | DZ | -4.0968830D 02 |
| R | 3.3668007D 08 | DEC | 2.8494079D 01 | RA | 7.9863557D 01 |
| V | 1.0421984D 03 | PTH | -7.8305651D 01 | AZ | 6.5431878D 01 |
| ALT | 3.3030677D 08 | LTGD | 2.8497128D 01 | LON | 3.1713119D 02 |
| VE | 2.1409535D 04 | PTE | -2.7322399D 00 | AZE | -8.0764533D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 4 APRIL 1968 | 19 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.5273009D 05 |
| X | 5.1436386D 07 | Y | 2.8967135D 08 | Z | 1.5987945D 08 |
| DX | -3.5600596D 02 | DY | -8.9512126D 02 | DZ | -4.1235119D 02 |
| R | 3.3483822D 08 | DEC | 2.8521119D 01 | RA | 7.9931045D 01 |
| V | 1.0478625D 03 | PTH | -7.8263566D 01 | AZ | 6.5546488D 01 |
| ALT | 3.2846492D 08 | LTGD | 2.8524186D 01 | LON | 3.0967814D 02 |
| VE | 2.1284493D 04 | PTE | -2.7628300D 00 | AZE | -8.9762056D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 4 APRIL 1968 20 HRS., 18 MIN., 16.634 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 3.5453009D 05
 X 5.0794106D 07 Y 2.8805579D 08 Z 1.5913478D 08
 DX-3.5763307D 02 DY-8.9996326D 02 DZ-4.1506831D 02
 R 3.3298657D 08 DEC 2.8548433D 01 RA 7.9999591D 01
 V 1.0536209D 03 PTH-7.8223716D 01 AZ 6.5656760D 01
 ALT 3.2661329D 08 LTGD 2.8551519D 01 LON 3.0222616D 02
 VE 2.1158853D 04 PTE-2.7941286D 00 AZE-8.9789538D 01

TIME 4 APRIL 1968 20 HRS., 48 MIN., 16.634 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 3.5633009D 05
 X 5.0148922D 07 Y 2.8643143D 08 Z 1.5838517D 08
 DX-3.5923363D 02 DY-9.0490085D 02 DZ-4.1783932D 02
 R 3.3112496D 08 DEC 2.8576026D 01 RA 8.0069204D 01
 V 1.0594735D 03 PTH-7.8185919D 01 AZ 6.5763082D 01
 ALT 3.2475168D 08 LTGD 2.8579132D 01 LON 2.9477524D 02
 VE 2.1032599D 04 PTE-2.8261513D 00 AZE-8.9756974D 01

TIME 4 APRIL 1968 21 HRS., 18 MIN., 16.634 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 3.5813009D 05
 X 4.9500880D 07 Y 2.8479809D 08 Z 1.5763053D 08
 DX-3.6080962D 02 DY-9.0993332D 02 DZ-4.2066404D 02
 R 3.2925320D 08 DEC 2.8603903D 01 RA 8.0139895D 01
 V 1.0654203D 03 PTH-7.8150004D 01 AZ 6.6865807D 01
 ALT 3.2287993D 08 LTGD 2.8607028D 01 LON 2.8732539D 02
 VE 2.0905720D 04 PTE-2.8589146D 00 AZE-8.9754365D 01

TIME 4 APRIL 1968 21 HRS., 48 MIN., 16.634 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 3.5993009D 05
 X 4.8850021D 07 Y 2.8315561D 08 Z 1.5687075D 08
 DX-3.6236286D 02 DY-9.1506015D 02 DZ-4.2354239D 02
 R 3.2737113D 08 DEC 2.8632068D 01 RA 8.0211676D 01
 V 1.0714617D 03 PTH-7.8115816D 01 AZ 6.5965250D 01
 ALT 3.2099787D 08 LTGD 2.8635213D 01 LON 2.7987664D 02
 VE 2.0778201D 04 PTE-2.8924363D 00 AZE-8.9751706D 01

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | |
|----------------------|-------------|------------|----------|-------------|------------------------|--------------------|
| TIME | 4 | APRIL 1968 | 22 HRS., | 18 MIN., | 16.694 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | FLIGHT TIME 3.6173009D | 05 |
| X | 4.8196386D | 07 | Y | 2.8150382D | 08 | Z 1.5610574D 08 |
| DX | -3.6389500D | 02 | DY | -9.2028106D | 02 | DZ -4.2647440D 02 |
| R | 3.2547856D | 08 | DEC | 2.8660528D | 01 | RA 8.0284560D 01 |
| V | 1.0775979D | 03 | PTH | -7.8083212D | 01 | AZ 6.6061700D 01 |
| ALT | 3.1910531D | 08 | LTGD | 2.8663693D | 01 | LON 2.7242899D 02 |
| VE | 2.0650031D | 04 | PTE | -2.9267354D | 00 | AZE -8.9748998D 01 |

| | | | | | | |
|----------------------|-------------|------------|----------|-------------|------------------------|--------------------|
| TIME | 4 | APRIL 1968 | 22 HRS., | 48 MIN., | 16.694 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | FLIGHT TIME 3.6353009D | 05 |
| X | 4.7540011D | 07 | Y | 2.7984254D | 08 | Z 1.5533541D 08 |
| DX | -3.6540754D | 02 | DY | -9.2559595D | 02 | DZ -4.2946022D 02 |
| R | 3.2357532D | 08 | DEC | 2.8689287D | 01 | RA 8.0358561D 01 |
| V | 1.0838296D | 03 | PTH | -7.8052058D | 01 | AZ 6.6155418D 01 |
| ALT | 3.1720208D | 08 | LTGD | 2.8692473D | 01 | LON 2.6498246D 02 |
| VE | 2.0521195D | 04 | PTE | -2.9618321D | 00 | AZE -8.9746236D 01 |

| | | | | | | |
|----------------------|-------------|------------|----------|-------------|------------------------|--------------------|
| TIME | 4 | APRIL 1968 | 23 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | FLIGHT TIME 3.6533009D | 05 |
| X | 4.6880930D | 07 | Y | 2.7817161D | 08 | Z 1.5455965D 08 |
| DX | -3.6690189D | 02 | DY | -9.3100489D | 02 | DZ -4.3250007D 02 |
| R | 3.2166124D | 08 | DEC | 2.8718351D | 01 | RA 8.0433695D 01 |
| V | 1.0901575D | 03 | PTH | -7.8022231D | 01 | AZ 6.6246644D 01 |
| ALT | 3.1528801D | 08 | LTGD | 2.8721558D | 01 | LON 2.5753706D 02 |
| VE | 2.0391682D | 04 | PTE | -2.9977477D | 00 | AZE -8.9743420D 01 |

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|----------------------|-------------|------------|----------|-------------|------------------------|--------------------|
| TIME | 4 | APRIL 1968 | 23 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | FLIGHT TIME 3.6713009D | 05 |
| X | 4.6219174D | 07 | Y | 2.7649087D | 08 | Z 1.5377837D 08 |
| DX | -3.6837930D | 02 | DY | -9.3650814D | 02 | DZ -4.3559429D 02 |
| R | 3.1973614D | 08 | DEC | 2.8747726D | 01 | RA 8.0509980D 01 |
| V | 1.0965825D | 03 | PTH | -7.7993616D | 01 | AZ 6.6335595D 01 |
| ALT | 3.1336292D | 08 | LTGD | 2.8750955D | 01 | LON 2.5009281D 02 |
| VE | 2.0261478D | 04 | PTE | -3.0345051D | 00 | AZE -8.9740547D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 0 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.6893009D 05 |
| X | 4.5554774D 07 | Y | 2.7480013D 08 | Z | 1.5299148D 08 |
| DX | -3.6984094D 02 | DY | -9.4210612D 02 | DZ | -4.3874329D 02 |
| R | 3.1779984D 08 | DEC | 2.8777419D 01 | RA | 8.0587433D 01 |
| V | 1.1031056D 03 | PTH | -7.7966107D 01 | AZ | 6.6422473D 01 |
| ALT | 3.1142663D 08 | LTGD | 2.8780669D 01 | LON | 2.4264973D 02 |
| VE | 2.0130573D 04 | PTE | -3.0721280D 00 | AZE | -8.9737614D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 0 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.7073009D 05 |
| X | 4.4887756D 07 | Y | 2.7309923D 08 | Z | 1.5219887D 08 |
| DX | -3.7128789D 02 | DY | -9.4779940D 02 | DZ | -4.4194760D 02 |
| R | 3.1585217D 08 | DEC | 2.8807435D 01 | RA | 8.0666073D 01 |
| V | 1.1097279D 03 | PTH | -7.7939604D 01 | AZ | 6.6507463D 01 |
| ALT | 3.0947897D 08 | LTGD | 2.8810707D 01 | LON | 2.3520784D 02 |
| VE | 1.9998951D 04 | PTE | -3.1106417D 00 | AZE | -8.9734619D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 1 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.7253009D 05 |
| X | 4.4218146D 07 | Y | 2.7138799D 08 | Z | 1.5140043D 08 |
| DX | -3.7272112D 02 | DY | -9.5358869D 02 | DZ | -4.4520780D 02 |
| R | 3.1389294D 08 | DEC | 2.8837781D 01 | RA | 8.0745922D 01 |
| V | 1.1164508D 03 | PTH | -7.7914012D 01 | AZ | 6.6590736D 01 |
| ALT | 3.0751975D 08 | LTGD | 2.8841077D 01 | LON | 2.2776716D 02 |
| VE | 1.9866603D 04 | PTE | -3.1500731D 00 | AZE | -8.9731560D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 1 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.7433009D 05 |
| X | 4.3545968D 07 | Y | 2.6966625D 08 | Z | 1.5059608D 08 |
| DX | -3.7414154D 02 | DY | -9.5947486D 02 | DZ | -4.4852455D 02 |
| R | 3.1192197D 08 | DEC | 2.8868465D 01 | RA | 8.0827003D 01 |
| V | 1.1232756D 03 | PTH | -7.7889244D 01 | AZ | 6.6672450D 01 |
| ALT | 3.0554879D 08 | LTGD | 2.8871784D 01 | LON | 2.2032770D 02 |
| VE | 1.9733514D 04 | PTE | -3.1904500D 00 | AZE | -8.9728435D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 2 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 3.7613009D | 05 |
| X | 4.2871243D | 07 | | Y | 2.6793382D | 08 | | Z | 1.4978571D | 08 |
| DX | -3.7554998D | 02 | | DY | -9.6545893D | 02 | | DZ | -4.5189863D | 02 |
| R | 3.0993909D | 08 | | DEC | 2.8899494D | 01 | | RA | 8.0909337D | 01 |
| V | 1.1302040D | 03 | | PTH | -7.7865217D | 01 | | AZ | 6.6752752D | 01 |
| ALT | 3.0356591D | 08 | | LTGD | 2.8902836D | 01 | | LON | 2.1288950D | 02 |
| VE | 1.9599673D | 04 | | PTE | -3.2318022D | 00 | | AZE | -8.9725240D | 01 |

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 2 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 3.7793009D | 05 |
| X | 4.2193994D | 07 | | Y | 2.6619054D | 08 | | Z | 1.4896921D | 08 |
| DX | -3.7694720D | 02 | | DY | -9.7154202D | 02 | | DZ | -4.5533086D | 02 |
| R | 3.0794409D | 08 | | DEC | 2.8930875D | 01 | | RA | 8.0992950D | 01 |
| V | 1.1372376D | 03 | | PTH | -7.7841853D | 01 | | AZ | 6.6831780D | 01 |
| ALT | 3.0157092D | 08 | | LTGD | 2.8934240D | 01 | | LON | 2.0545258D | 02 |
| VE | 1.9465066D | 04 | | PTE | -3.2741609D | 00 | | AZE | -8.9721972D | 01 |

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 3 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 3.7973009D | 05 |
| X | 4.1514240D | 07 | | Y | 2.6443621D | 08 | | Z | 1.4814649D | 08 |
| DX | -3.7833390D | 02 | | DY | -9.7772543D | 02 | | DZ | -4.5882216D | 02 |
| R | 3.0593680D | 08 | | DEC | 2.8962615D | 01 | | RA | 8.1077868D | 01 |
| V | 1.1443781D | 03 | | PTH | -7.7819079D | 01 | | AZ | 6.6909662D | 01 |
| ALT | 2.9956364D | 08 | | LTGD | 2.8966005D | 01 | | LON | 1.9801697D | 02 |
| VE | 1.9329682D | 04 | | PTE | -3.3175588D | 00 | | AZE | -8.9718630D | 01 |

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|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 3 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 3.8153009D | 05 |
| X | 4.0831998D | 07 | | Y | 2.6267067D | 08 | | Z | 1.4731742D | 08 |
| DX | -3.7971072D | 02 | | DY | -9.8401057D | 02 | | DZ | -4.6237351D | 02 |
| R | 3.0391702D | 08 | | DEC | 2.8994723D | 01 | | RA | 8.2164119D | 01 |
| V | 1.1516277D | 03 | | PTH | -7.7796824D | 01 | | AZ | 6.6986518D | 01 |
| ALT | 2.9754387D | 08 | | LTGD | 2.8998138D | 01 | | LON | 1.9058269D | 02 |
| VE | 1.9193507D | 04 | | PTE | -3.3620304D | 00 | | AZE | -8.9715210D | 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|--------|-------------|------------|----|
| TIME | 5 | APRIL | 1968 | 4 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 3.8333009D | 05 |
| X | 4.0147287D | 07 | | Y | 2.6089371D | 08 | | Z | 1.4648190D | 08 | |
| DX | -3.8107826D | 02 | | DY | -9.9039900D | 02 | | DZ | -4.6598601D | 02 | |
| R | 3.0188455D | 08 | | DEC | 2.9027207D | 01 | | RA | 8.1251732D | 01 | |
| V | 1.1589883D | 03 | | PTH | -7.7775022D | 01 | | AZ | 6.7062463D | 01 | |
| ALT | 2.9551142D | 08 | | LTGD | 2.9030648D | 01 | | LON | 1.8314977D | 02 | |
| VE | 1.9056528D | 04 | | PTE | -3.4076121D | 00 | | AZE | -8.9711709D | 01 | |

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|----------------------|-------------|-------|------|------|-------------|----|-------|--------|-------------|------------|----|
| TIME | 5 | APRIL | 1968 | 4 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 3.8513009D | 05 |
| X | 3.9460122D | 07 | | Y | 2.5910517D | 08 | | Z | 1.4563983D | 08 | |
| DX | -3.8243704D | 02 | | DY | -9.9689239D | 02 | | DZ | -4.6966079D | 02 | |
| R | 2.9983921D | 08 | | DEC | 2.9060076D | 01 | | RA | 8.1340738D | 01 | |
| V | 1.1664621D | 03 | | PTH | -7.7753610D | 01 | | AZ | 6.7137602D | 01 | |
| ALT | 2.9346608D | 08 | | LTGD | 2.9063543D | 01 | | LON | 1.7571824D | 02 | |
| VE | 1.8918732D | 04 | | PTE | -3.4543421D | 00 | | AZE | -8.9708124D | 01 | |

| | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|--------|-------------|------------|----|
| TIME | 5 | APRIL | 1968 | 5 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 3.8693009D | 05 |
| X | 3.8770518D | 07 | | Y | 2.5730484D | 08 | | Z | 1.4479109D | 08 | |
| DX | -3.8378757D | 02 | | DY | -1.0034926D | 03 | | DZ | -4.7339910D | 02 | |
| R | 2.9778078D | 08 | | DEC | 2.9093340D | 01 | | RA | 8.1431168D | 01 | |
| V | 1.1740515D | 03 | | PTH | -7.7732526D | 01 | | AZ | 6.7212037D | 01 | |
| ALT | 2.9140766D | 08 | | LTGD | 2.9096833D | 01 | | LON | 1.6828814D | 02 | |
| VE | 1.8780106D | 04 | | PTE | -3.5022607D | 00 | | AZE | -8.9704452D | 01 | |

| | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|--------|-------------|------------|----|
| TIME | 5 | APRIL | 1968 | 5 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 3.8873009D | 05 |
| X | 3.8078491D | 07 | | Y | 2.5549253D | 08 | | Z | 1.4393556D | 08 | |
| DX | -3.8513029D | 02 | | DY | -1.0102015D | 03 | | DZ | -4.7720225D | 02 | |
| R | 2.9570906D | 08 | | DEC | 2.9127006D | 01 | | RA | 8.1523056D | 01 | |
| V | 1.1817590D | 03 | | PTH | -7.7711714D | 01 | | AZ | 6.7285864D | 01 | |
| ALT | 2.8933595D | 08 | | LTGD | 2.9130526D | 01 | | LON | 1.6085949D | 02 | |
| VE | 1.8640637D | 04 | | PTE | -3.5514103D | 00 | | AZE | -8.9700688D | 01 | |

D5-15481-1

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 6 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.9053009D 05 |
| X | 3.7384054D 07 | Y | 2.5366804D 08 | Z | 1.4307312D 08 |
| DX | -3.8646560D 02 | DY | -1.0170212D 03 | DZ | -4.8107166D 02 |
| R | 2.9362384D 08 | DEC | 2.9161085D 01 | RA | 8.1616439D 01 |
| V | 1.1895872D 03 | PTH | -7.7691115D 01 | AZ | 6.7359175D 01 |
| ALT | 2.8725075D 08 | LTGD | 2.9164633D 01 | LON | 1.5343234D 02 |
| VE | 1.8500311D 04 | PTE | -3.6018353D 00 | AZE | -8.9696830D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 6 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.9233009D 05 |
| X | 3.6687219D 07 | Y | 2.5183118D 08 | Z | 1.4220366D 08 |
| DX | -3.8779385D 02 | DY | -1.0239541D 03 | DZ | -4.8500880D 02 |
| R | 2.9152492D 08 | DEC | 2.9195588D 01 | RA | 8.1711352D 01 |
| V | 1.1975390D 03 | PTH | -7.7670678D 01 | AZ | 6.7432057D 01 |
| ALT | 2.8515183D 08 | LTGD | 2.9199164D 01 | LON | 1.4600672D 02 |
| VE | 1.8359113D 04 | PTE | -3.6535829D 00 | AZE | -8.9692874D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 7 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.9413009D 05 |
| X | 3.5988000D 07 | Y | 2.4998174D 08 | Z | 1.4132705D 08 |
| DX | -3.8911539D 02 | DY | -1.0310024D 03 | DZ | -4.8901526D 02 |
| R | 2.8941206D 08 | DEC | 2.9230524D 01 | RA | 8.1807836D 01 |
| V | 1.2056171D 03 | PTH | -7.7650350D 01 | AZ | 6.7504595D 01 |
| ALT | 2.8303899D 08 | LTGD | 2.9234129D 01 | LON | 1.3858267D 02 |
| VE | 1.8217030D 04 | PTE | -3.7067025D 00 | AZE | -8.9688815D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 7 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.9593009D 05 |
| X | 3.5286408D 07 | Y | 2.4811950D 08 | Z | 1.4044316D 08 |
| DX | -3.9043048D 02 | DY | -1.0381686D 03 | DZ | -4.9309272D 02 |
| R | 2.8728505D 08 | DEC | 2.9265905D 01 | RA | 8.1905932D 01 |
| V | 1.2138247D 03 | PTH | -7.7630079D 01 | AZ | 6.7576870D 01 |
| ALT | 2.8091199D 08 | LTGD | 2.9269539D 01 | LON | 1.3116024D 02 |
| VE | 1.8074048D 04 | PTE | -3.7612462D 00 | AZE | -8.9684650D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 8 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.9773009D 05 |
| X | 3.4582454D 07 | Y | 2.4624426D 08 | Z | 1.3955187D 08 |
| DX | -3.9173938D 02 | DY | -1.0454556D 03 | DZ | -4.9724294D 02 |
| R | 2.8514366D 08 | DEC | 2.9301742D 01 | RA | 8.2005682D 01 |
| V | 1.2221652D 03 | PTH | -7.7609818D 01 | AZ | 6.7648960D 01 |
| ALT | 2.7877061D 08 | LTGD | 2.9305406D 01 | LON | 1.2373945D 02 |
| VE | 1.7930151D 04 | PTE | -3.8172692D 00 | AZE | -8.9680373D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 8 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 3.9953009D 05 |
| X | 3.3876150D 07 | Y | 2.4435579D 08 | Z | 1.3865304D 08 |
| DX | -3.9304230D 02 | DY | -1.0528660D 03 | DZ | -5.0146779D 02 |
| R | 2.8298765D 08 | DEC | 2.9338046D 01 | RA | 8.2107131D 01 |
| V | 1.2306417D 03 | PTH | -7.7589518D 01 | AZ | 6.7720941D 01 |
| ALT | 2.7661462D 08 | LTGD | 2.9341741D 01 | LON | 1.1632037D 02 |
| VE | 1.7785326D 04 | PTE | -3.8748293D 00 | AZE | -8.9675982D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 9 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.0133009D 05 |
| X | 3.3167505D 07 | Y | 2.4245387D 08 | Z | 1.3774654D 08 |
| DX | -3.9433941D 02 | DY | -1.0604030D 03 | DZ | -5.0576925D 02 |
| R | 2.8081679D 08 | DEC | 2.9374831D 01 | RA | 8.2210328D 01 |
| V | 1.2392581D 03 | PTH | -7.7569132D 01 | AZ | 6.7792887D 01 |
| ALT | 2.7444377D 08 | LTGD | 2.9378557D 01 | LON | 1.0890303D 02 |
| VE | 1.7639556D 04 | PTE | -3.9339879D 00 | AZE | -8.9671469D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 9 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.0313009D 05 |
| X | 3.2456531D 07 | Y | 2.4053826D 08 | Z | 1.3683222D 08 |
| DX | -3.9563087D 02 | DY | -1.0680696D 03 | DZ | -5.1014940D 02 |
| R | 2.7863083D 08 | DEC | 2.9412108D 01 | RA | 8.2315322D 01 |
| V | 1.2480180D 03 | PTH | -7.7548614D 01 | AZ | 6.7864870D 01 |
| ALT | 2.7225782D 08 | LTGD | 2.9415867D 01 | LON | 1.0148749D 02 |
| VE | 1.7492826D 04 | PTE | -3.9948096D 00 | AZE | -8.9666831D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 10 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.0493009D 05 |
| X | 3.1743237D 07 | Y | 2.3860874D 08 | Z | 1.3590995D 08 |
| DX | -3.9691676D 02 | DY | -1.0758693D 03 | DZ | -5.1461044D 02 |
| R | 2.7642952D 08 | DEC | 2.9449892D 01 | RA | 8.2422165D 01 |
| V | 1.2569254D 03 | PTH | -7.7527918D 01 | AZ | 6.7936962D 01 |
| ALT | 2.7005652D 08 | LTGD | 2.9453684D 01 | LON | 9.4073804D 01 |
| VE | 1.7345120D 04 | PTE | -4.0573628D 00 | AZE | -8.9662062D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 10 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.0673009D 05 |
| X | 3.1027634D 07 | Y | 2.3666505D 08 | Z | 1.3497958D 08 |
| DX | -3.9819717D 02 | DY | -1.0838055D 03 | DZ | -5.1915468D 02 |
| R | 2.7421259D 08 | DEC | 2.9488196D 01 | RA | 8.2530913D 01 |
| V | 1.2659846D 03 | PTH | -7.7506999D 01 | AZ | 6.8009231D 01 |
| ALT | 2.6783960D 08 | LTGD | 2.9492021D 01 | LON | 8.6662018D 01 |
| VE | 1.7196422D 04 | PTE | -4.1217197D 00 | AZE | -8.9657157D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 11 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.0853009D 05 |
| X | 3.0309731D 07 | Y | 2.3470695D 08 | Z | 1.3404094D 08 |
| DX | -3.9947213D 02 | DY | -1.0918820D 03 | DZ | -5.2378455D 02 |
| R | 2.7197979D 08 | DEC | 2.9527034D 01 | RA | 8.2641622D 01 |
| V | 1.2751998D 03 | PTH | -7.7485814D 01 | AZ | 6.8081748D 01 |
| ALT | 2.6560682D 08 | LTGD | 2.9530895D 01 | LON | 7.9252194D 01 |
| VE | 1.7046715D 04 | PTE | -4.1879568D 00 | AZE | -8.9652109D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 11 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.1033009D 05 |
| X | 2.9589538D 07 | Y | 2.3273419D 08 | Z | 1.3309390D 08 |
| DX | -4.0074163D 02 | DY | -1.1001028D 03 | DZ | -5.2850263D 02 |
| R | 2.6973085D 08 | DEC | 2.9566423D 01 | RA | 8.2754354D 01 |
| V | 1.2845758D 03 | PTH | -7.7464316D 01 | AZ | 6.8154579D 01 |
| ALT | 2.6335788D 08 | LTGD | 2.9570318D 01 | LON | 7.1844393D 01 |
| VE | 1.6895981D 04 | PTE | -4.2561549D 00 | AZE | -8.9646912D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|--------|-------------|------------|----|
| TIME | 5 | APRIL | 1968 | 12 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.1213009D | 05 |
| X | 2.8867064D | 07 | | Y | 2.3074649D | 08 | | Z | 1.3213828D | 08 | |
| DX | -4.0200564D | 02 | | DY | -1.1084718D | 03 | | DZ | -5.3331164D | 02 | |
| R | 2.6746547D | 08 | | DEC | 2.9606376D | 01 | | RA | 8.2869172D | 01 | |
| V | 1.2941173D | 03 | | PTH | -7.7442462D | 01 | | AZ | 6.8227795D | 01 | |
| ALT | 2.6109252D | 08 | | LTGD | 2.9610308D | 01 | | LON | 6.4438678D | 01 | |
| VE | 1.6744205D | 04 | | PTE | -4.3264000D | 00 | | AZE | -8.9641560D | 01 | |
| | | | | | | | | | | | |
| TIME | 5 | APRIL | 1968 | 12 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.1393009D | 05 |
| X | 2.8142321D | 07 | | Y | 2.2874360D | 08 | | Z | 1.3117392D | 08 | |
| DX | -4.0326408D | 02 | | DY | -1.1169937D | 03 | | DZ | -5.3821442D | 02 | |
| R | 2.6518337D | 08 | | DEC | 2.9646912D | 01 | | RA | 8.2986143D | 01 | |
| V | 1.3038296D | 03 | | PTH | -7.7420207D | 01 | | AZ | 6.8301461D | 01 | |
| ALT | 2.5881043D | 08 | | LTGD | 2.9650881D | 01 | | LON | 5.7035116D | 01 | |
| VE | 1.6591366D | 04 | | PTE | -4.3987827D | 00 | | AZE | -8.9636045D | 01 | |
| | | | | | | | | | | | |
| TIME | 5 | APRIL | 1968 | 13 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.1573009D | 05 |
| X | 2.7415317D | 07 | | Y | 2.2672522D | 08 | | Z | 1.3020065D | 08 | |
| DX | -4.0451682D | 02 | | DY | -1.1256728D | 03 | | DZ | -5.4321399D | 02 | |
| R | 2.6288426D | 08 | | DEC | 2.9688046D | 01 | | RA | 8.3105338D | 01 | |
| V | 1.3137178D | 03 | | PTH | -7.7397508D | 01 | | AZ | 6.8375647D | 01 | |
| ALT | 2.5651134D | 08 | | LTGD | 2.9692053D | 01 | | LON | 4.9633778D | 01 | |
| VE | 1.6437447D | 04 | | PTE | -4.4733997D | 00 | | AZE | -8.9630360D | 01 | |
| | | | | | | | | | | | |
| TIME | 5 | APRIL | 1968 | 13 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.1753009D | 05 |
| X | 2.6686064D | 07 | | Y | 2.2469108D | 08 | | Z | 1.2921829D | 08 | |
| DX | -4.0576373D | 02 | | DY | -1.1345141D | 03 | | DZ | -5.4831353D | 02 | |
| R | 2.6056783D | 08 | | DEC | 2.9729798D | 01 | | RA | 8.3226830D | 01 | |
| V | 1.3237878D | 03 | | PTH | -7.7374317D | 01 | | AZ | 6.8450422D | 01 | |
| ALT | 2.5419492D | 08 | | LTGD | 2.9733844D | 01 | | LON | 4.2234737D | 01 | |
| VE | 1.6282429D | 04 | | PTE | -4.5503533D | 00 | | AZE | -8.9624496D | 01 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|--------|-------------|------------|----|
| TIME | 5 | APRIL | 1968 | 14 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.1933009D | 05 |
| X | 2.5954571D | 07 | | Y | 2.2264087D | 08 | | Z | 1.2822666D | 08 | |
| DX | -4.0700457D | 02 | | DY | -1.1435227D | 03 | | DZ | -5.6351639D | 02 | |
| R | 2.5823376D | 08 | | DEC | 2.9772185D | 01 | | RA | 8.3350698D | 01 | |
| V | 1.3340454D | 03 | | PTH | -7.7350590D | 01 | | AZ | 6.8525854D | 01 | |
| ALT | 2.5186086D | 08 | | LTGD | 2.9776271D | 01 | | LON | 3.4838072D | 01 | |
| VE | 1.6126293D | 04 | | PTE | -4.6297523D | 00 | | AZE | -8.9618447D | 01 | |
| | | | | | | | | | | | |
| TIME | 5 | APRIL | 1968 | 14 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.2113009D | 05 |
| X | 2.5220851D | 07 | | Y | 2.2057429D | 08 | | Z | 1.2722557D | 08 | |
| DX | -4.0823912D | 02 | | DY | -1.1527039D | 03 | | DZ | -5.5882610D | 02 | |
| R | 2.5588172D | 08 | | DEC | 2.9815227D | 01 | | RA | 8.3477024D | 01 | |
| V | 1.3444970D | 03 | | PTH | -7.7326281D | 01 | | AZ | 6.8602013D | 01 | |
| ALT | 2.4950884D | 08 | | LTGD | 2.9819355D | 01 | | LON | 2.7443865D | 01 | |
| VE | 1.5969017D | 04 | | PTE | -4.7117126D | 00 | | AZE | -8.9612202D | 01 | |
| | | | | | | | | | | | |
| TIME | 5 | APRIL | 1968 | 15 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.2293009D | 05 |
| X | 2.4484914D | 07 | | Y | 2.1849103D | 08 | | Z | 1.2621482D | 08 | |
| DX | -4.0946707D | 02 | | DY | -1.1620636D | 03 | | DZ | -5.6424639D | 02 | |
| R | 2.5351138D | 08 | | DEC | 2.9858945D | 01 | | RA | 8.3605895D | 01 | |
| V | 1.3551491D | 03 | | PTH | -7.7301342D | 01 | | AZ | 6.8678972D | 01 | |
| ALT | 2.4713851D | 08 | | LTGD | 2.9863115D | 01 | | LON | 2.0052203D | 01 | |
| VE | 1.5810582D | 04 | | PTE | -4.7963573D | 00 | | AZE | -8.9605752D | 01 | |
| | | | | | | | | | | | |
| TIME | 5 | APRIL | 1968 | 15 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT | TIME | 4.2473009D | 05 |
| X | 2.3746774D | 07 | | Y | 2.1639075D | 08 | | Z | 1.2519421D | 08 | |
| DX | -4.1068807D | 02 | | DY | -1.1716076D | 03 | | DZ | -5.6978123D | 02 | |
| R | 2.5112240D | 08 | | DEC | 2.9903361D | 01 | | RA | 8.3737402D | 01 | |
| V | 1.3660086D | 03 | | RTH | -7.7275725D | 01 | | AZ | 6.8756802D | 01 | |
| ALT | 2.4474954D | 08 | | LTGD | 2.9907574D | 01 | | LON | 1.2663177D | 01 | |
| VE | 1.5650966D | 04 | | PTE | -4.8838180D | 00 | | AZE | -8.9599088D | 01 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 16 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.2653009D | 05 |
| X | 2.3006442D | 07 | | Y | 2.1427313D | 08 | | Z | 1.2416354D | 08 |
| DX | -4.1190171D | 02 | | DY | -1.1813423D | 03 | | DZ | -5.7543477D | 02 |
| R | 2.4871440D | 08 | | DEC | 2.9948496D | 01 | | RA | 8.3871642D | 01 |
| V | 1.3770830D | 03 | | PTH | -7.7249380D | 01 | | AZ | 6.8835578D | 01 |
| ALT | 2.4234156D | 08 | | LTGD | 2.9952754D | 01 | | LON | 5.2748838D | 00 |
| VE | 1.5490147D | 04 | | PTE | -4.9742345D | 00 | | AZE | -8.9592198D | 01 |

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 16 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.2833009D | 05 |
| X | 2.2263932D | 07 | | Y | 2.1213780D | 08 | | Z | 1.2312257D | 08 |
| DX | -4.1310754D | 02 | | DY | -1.1912744D | 03 | | DZ | -5.8121142D | 02 |
| R | 2.4628702D | 08 | | DEC | 2.9994373D | 01 | | RA | 8.4008717D | 01 |
| V | 1.3883800D | 03 | | PTH | -7.7222258D | 01 | | AZ | 6.8915378D | 01 |
| ALT | 2.3991420D | 08 | | LTGD | 2.9998678D | 01 | | LON | 3.5789339D | 02 |
| VE | 1.5328103D | 04 | | PTE | -5.0677566D | 00 | | AZE | -8.9585071D | 01 |

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 17 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.3013009D | 05 |
| X | 2.1519260D | 07 | | Y | 2.0998442D | 08 | | Z | 1.2207110D | 08 |
| DX | -4.1430500D | 02 | | DY | -1.2014110D | 03 | | DZ | -5.8711585D | 02 |
| R | 2.4383988D | 08 | | DEC | 3.0041019D | 01 | | RA | 8.4148735D | 01 |
| V | 1.3999078D | 03 | | PTH | -7.7194305D | 01 | | AZ | 6.8996279D | 01 |
| ALT | 2.3746707D | 08 | | LTGD | 3.0045371D | 01 | | LON | 3.5051287D | 02 |
| VE | 1.5164810D | 04 | | PTE | -5.1645441D | 00 | | AZE | -8.9577695D | 01 |

| | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|
| TIME | 5 | APRIL | 1968 | 17 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.3193009D | 05 |
| X | 2.0772440D | 07 | | Y | 2.0781260D | 08 | | Z | 1.2100888D | 08 |
| DX | -4.1549352D | 02 | | DY | -1.2117595D | 03 | | DZ | -5.9315301D | 02 |
| R | 2.4137257D | 08 | | DEC | 3.0088459D | 01 | | RA | 8.4291810D | 01 |
| V | 1.4116751D | 03 | | PTH | -7.7165467D | 01 | | AZ | 6.9078363D | 01 |
| ALT | 2.3499977D | 08 | | LTGD | 3.0092859D | 01 | | LON | 3.4313542D | 02 |
| VE | 1.5000243D | 04 | | PTE | -5.2647680D | 00 | | AZE | -8.9570056D | 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 5 APRIL 1968 | 18 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.3373009D 05 |
| X | 2.0023489D 07 | Y | 2.0562195D 08 | Z | 1.1993566D 08 |
| DX-4. | 1.667241D 02 | DY-1. | 2.223280D 03 | DZ-5. | 9.9932813D 02 |
| R | 2.3888468D 08 | DEC | 3.0136719D 01 | RA | 8.4438063D 01 |
| V | 1.4236909D 03 | PTH-7. | 7.135689D 01 | AZ | 6.9161714D 01 |
| ALT | 2.3251190D 08 | LTGD | 3.0141169D 01 | LON | 3.3576113D 02 |
| VE | 1.4834379D 04 | PTE-5. | 3.3686116D 00 | AZE-8. | 9.9562142D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 5 APRIL 1968 | 18 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.3553009D 05 |
| X | 1.9272425D 07 | Y | 2.0341208D 08 | Z | 1.1885121D 08 |
| DX-4. | 1.784092D 02 | DY-1. | 2.2331247D 03 | DZ-6. | 0.564678D 02 |
| R | 2.3637578D 08 | DEC | 3.0185829D 01 | RA | 8.4587622D 01 |
| V | 1.4359650D 03 | PTH-7. | 7.104913D 01 | AZ | 6.9246419D 01 |
| ALT | 2.3000302D 08 | LTGD | 3.0190331D 01 | LON | 3.2839016D 02 |
| VE | 1.4667191D 04 | PTE-5. | 4.762713D 00 | AZE-8. | 9.9553937D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 5 APRIL 1968 | 19 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.3733009D 05 |
| X | 1.8519268D 07 | Y | 2.0118256D 08 | Z | 1.1775525D 08 |
| DX-4. | 1.899821D 02 | DY-1. | 2.2441586D 03 | DZ-6. | 1.211485D 02 |
| R | 2.3384543D 08 | DEC | 3.0235819D 01 | RA | 8.4740623D 01 |
| V | 1.4485078D 03 | PTH-7. | 7.7073078D 01 | AZ | 6.9332570D 01 |
| ALT | 2.2747268D 08 | LTGD | 3.0240374D 01 | LON | 3.2102263D 02 |
| VE | 1.4498653D 04 | PTE-5. | 5.5879582D 00 | AZE-8. | 9.9545425D 01 |

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|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 5 APRIL 1968 | 19 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.3913009D 05 |
| X | 1.7764039D 07 | Y | 1.9893296D 08 | Z | 1.1664750D 08 |
| DX-4. | 2.014332D 02 | DY-1. | 2.2554392D 03 | DZ-6. | 1.873861D 02 |
| R | 2.3129315D 08 | DEC | 3.0286720D 01 | RA | 8.4897211D 01 |
| V | 1.4613300D 03 | PTH-7. | 7.7040120D 01 | AZ | 6.9420262D 01 |
| ALT | 2.2492042D 08 | LTGD | 3.0291330D 01 | LON | 3.1365868D 02 |
| VE | 1.4328736D 04 | PTE-5. | 7.038988D 00 | AZE-8. | 9.9536589D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 20 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.4093009D 05 |
| X | 1.7006760D 07 | Y | 1.9666283D 08 | Z | 1.1552769D 08 |
| DX | -4.2127521D 02 | DY | -1.2669763D 03 | DZ | -6.2552474D 02 |
| R | 2.2871848D 08 | DEC | 3.0338565D 01 | RA | 8.5067539D 01 |
| V | 1.4744433D 03 | PTH | -7.7005974D 01 | AZ | 6.9509595D 01 |
| ALT | 2.2234577D 08 | LTGD | 3.0343232D 01 | LON | 3.0629848D 02 |
| VE | 1.4157414D 04 | PTE | -5.8243373D 00 | AZE | -8.9527411D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 20 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.4273009D 05 |
| X | 1.6247457D 07 | Y | 1.9437169D 08 | Z | 1.1439551D 08 |
| DX | -4.2239271D 02 | DY | -1.2787808D 03 | DZ | -6.3248033D 02 |
| R | 2.2612091D 08 | DEC | 3.0391390D 01 | RA | 8.5221771D 01 |
| V | 1.4878600D 03 | PTH | -7.6970570D 01 | AZ | 6.9600672D 01 |
| ALT | 2.1974821D 08 | LTGD | 3.0396115D 01 | LON | 2.9894218D 02 |
| VE | 1.3984655D 04 | PTE | -5.9495368D 00 | AZE | -8.9517870D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 21 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.4453009D 05 |
| X | 1.5486156D 07 | Y | 1.9205905D 08 | Z | 1.1325065D 08 |
| DX | -4.2349454D 02 | DY | -1.2908639D 03 | DZ | -6.3961296D 02 |
| R | 2.2349991D 08 | DEC | 3.0445232D 01 | RA | 8.5390080D 01 |
| V | 1.5015931D 03 | PTH | -7.6933835D 01 | AZ | 6.9693604D 01 |
| ALT | 2.1712723D 08 | LTGD | 3.0450018D 01 | LON | 2.9158995D 02 |
| VE | 1.3810430D 04 | PTE | -6.0797810D 00 | AZE | -8.9507947D 01 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 5 APRIL 1968 | 21 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.4633009D 05 |
| X | 1.4722887D 07 | Y | 1.8972440D 08 | Z | 1.1209279D 08 |
| DX | -4.2457924D 02 | DY | -1.3032376D 03 | DZ | -6.4693069D 02 |
| R | 2.2085494D 08 | DEC | 3.0500130D 01 | RA | 8.5562653D 01 |
| V | 1.5156567D 03 | PTH | -7.6895692D 01 | AZ | 6.9788507D 01 |
| ALT | 2.1448228D 08 | LTGD | 3.0504978D 01 | LON | 2.8424199D 02 |
| VE | 1.3634706D 04 | PTE | -6.2153769D 00 | AZE | -8.9497618D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 0 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.5333009D 05 |
| X | 1.0878261D 07 | Y | 1.7770144D 08 | Z | 1.0609591D 08 |
| DX | 4.2968351D 02 | DY | 1.3699485D 03 | DZ | 6.8662017D 02 |
| R | 2.0724980D 08 | DEC | 3.0791993D 01 | RA | 8.6496919D 01 |
| V | 1.5914880D 03 | PTH | 7.6680837D 01 | AZ | 7.0297143D 01 |
| ALT | 2.0087724D 08 | LTGD | 3.0797188D 01 | LON | 2.4757359D 02 |
| VE | 1.2732418D 04 | PTE | 6.9862957D 00 | AZE | 8.9438947D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 0 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.5713009D 05 |
| X | 1.0103979D 07 | Y | 1.7522262D 08 | Z | 1.0485226D 08 |
| DX | 4.3062511D 02 | DY | 1.3843694D 03 | DZ | 6.9525278D 02 |
| R | 2.0444817D 08 | DEC | 3.0854186D 01 | RA | 8.6699765D 01 |
| V | 1.6078846D 03 | PTH | 7.6632354D 01 | AZ | 7.0406726D 01 |
| ALT | 1.9807562D 08 | LTGD | 3.0859458D 01 | LON | 2.4025591D 02 |
| VE | 1.2546968D 04 | PTE | 7.1620648D 00 | AZE | 8.9425587D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 1 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.5893009D 05 |
| X | 9.3280303D 06 | Y | 1.7271747D 08 | Z | 1.0359284D 08 |
| DX | 4.3153396D 02 | DY | 1.3991921D 03 | DZ | 7.0414564D 02 |
| R | 2.0161799D 08 | DEC | 3.0917781D 01 | RA | 8.6908600D 01 |
| V | 1.6247403D 03 | PTH | 7.6581775D 01 | AZ | 7.0519321D 01 |
| ALT | 1.9524547D 08 | LTGD | 3.0923134D 01 | LON | 2.3294421D 02 |
| VE | 1.2359762D 04 | PTE | 7.3462152D 00 | AZE | 8.9411599D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 1 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.6073009D 05 |
| X | 8.5504780D 06 | Y | 1.7018527D 08 | Z | 1.0231717D 08 |
| DX | 4.3240672D 02 | DY | 1.4144374D 03 | DZ | 7.1331296D 02 |
| R | 1.9875850D 08 | DEC | 3.0982841D 01 | RA | 8.7123749D 01 |
| V | 1.6420792D 03 | PTH | 7.6528972D 01 | AZ | 7.0635119D 01 |
| ALT | 1.9238600D 08 | LTGD | 3.0988278D 01 | LON | 2.2563883D 02 |
| VE | 1.2170757D 04 | PTE | 7.5393527D 00 | AZE | 8.9396939D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|--|--|
| TIME | 5 | APRIL | 1968 | 22 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.4813009D | 05 | | |
| X | 1.3957682D | 07 | | Y | 1.8736721D | 08 | | Z | 1.1092159D | 08 | | |
| DX | -4.2564522D | 02 | | DY | -1.3159149D | 03 | | DZ | -6.5444217D | 02 | | |
| R | 2.1818544D | 08 | | DEC | 3.0556125D | 01 | | RA | 8.5739688D | 01 | | |
| V | 1.5300655D | 03 | | PTH | -7.6856061D | 01 | | AZ | 6.9885503D | 01 | | |
| ALT | 2.1181280D | 08 | | LTGD | 3.0561038D | 01 | | LON | 2.7689850D | 02 | | |
| VE | 1.3457451D | 04 | | PTE | -6.3566565D | 00 | | AZE | -8.9486859D | 01 | | |

| | | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|--|--|
| TIME | 5 | APRIL | 1968 | 22 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.4993009D | 05 | | |
| X | 1.3190576D | 07 | | Y | 1.8498692D | 08 | | Z | 1.0973668D | 08 | | |
| DX | -4.2669072D | 02 | | DY | -1.3289095D | 03 | | DZ | -6.6215660D | 02 | | |
| R | 2.1549081D | 08 | | DEC | 3.0613261D | 01 | | RA | 8.5921397D | 01 | | |
| V | 1.5448355D | 03 | | PTH | -7.6814853D | 01 | | AZ | 6.9984723D | 01 | | |
| ALT | 2.0911819D | 08 | | LTGD | 3.0618241D | 01 | | LON | 2.6955967D | 02 | | |
| VE | 1.3278631D | 04 | | PTE | -6.5039797D | 00 | | AZE | -8.9475642D | 01 | | |

| | | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|--|--|
| TIME | 5 | APRIL | 1968 | 23 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.5173009D | 05 | | |
| X | 1.2421609D | 07 | | Y | 1.8258294D | 08 | | Z | 1.0853770D | 08 | | |
| DX | -4.2771376D | 02 | | DY | -1.3422359D | 03 | | DZ | -6.7008389D | 02 | | |
| R | 2.1277043D | 08 | | DEC | 3.0671585D | 01 | | RA | 8.6108006D | 01 | | |
| V | 1.5599836D | 03 | | PTH | -7.6771980D | 01 | | AZ | 7.0086303D | 01 | | |
| ALT | 2.0639783D | 08 | | LTGD | 3.0676633D | 01 | | LON | 2.6222575D | 02 | | |
| VE | 1.3098210D | 04 | | PTE | -6.6577376D | 00 | | AZE | -8.9463939D | 01 | | |

| | | | | | | | | | | | | |
|----------------------|-------------|-------|------|------|-------------|----|-------|-------------|-------------|-----|--|--|
| TIME | 5 | APRIL | 1968 | 23 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 4.5353009D | 05 | | |
| X | 1.1650821D | 07 | | Y | 1.8015466D | 08 | | Z | 1.0732424D | 08 | | |
| DX | -4.2871217D | 02 | | DY | -1.3559100D | 03 | | DZ | -6.7823462D | 02 | | |
| R | 2.1002366D | 08 | | DEC | 3.0731145D | 01 | | RA | 8.6299760D | 01 | | |
| V | 1.5755279D | 03 | | PTH | -7.6727342D | 01 | | AZ | 7.0190391D | 01 | | |
| ALT | 2.0365107D | 08 | | LTGD | 3.0736265D | 01 | | LON | 2.5489697D | 02 | | |
| VE | 1.2916152D | 04 | | PTE | -6.8183552D | 00 | | AZE | -8.9451718D | 01 | | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 2 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.6253009D 05 |
| X | 7.7713900D 06 | Y | 1.6762523D 08 | Z | 1.0102474D 08 |
| DX- | 4.3323967D 02 | DY- | 1.4301278D 03 | DZ- | 7.2277010D 02 |
| R | 1.9586886D 08 | DEC | 3.1049434D 01 | RA | 8.7345566D 01 |
| V | 1.6599273D 03 | PTH- | 7.6473809D 01 | AZ | 7.0754327D 01 |
| ALT | 1.8949638D 08 | LTGD | 3.1054957D 01 | LON | 2.1834011D 02 |
| VE | 1.1979907D 04 | PTE- | 7.7421425D 00 | AZE- | 8.9381558D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 2 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.6433009D 05 |
| X | 6.9908415D 06 | Y | 1.6503653D 08 | Z | 9.9715017D 07 |
| DX- | 4.3402865D 02 | DY- | 1.4462875D 03 | DZ- | 7.9253371D 02 |
| R | 1.9294821D 08 | DEC | 3.1117629D 01 | RA | 8.7574433D 01 |
| V | 1.6783129D 03 | PTH- | 7.6416138D 01 | AZ | 7.0877170D 01 |
| ALT | 1.8657575D 08 | LTGD | 3.1123244D 01 | LON | 2.1104844D 02 |
| VE | 1.1787167D 04 | PTE- | 7.9553165D 00 | AZE- | 8.9365406D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 3 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.6613009D 05 |
| X | 6.2089160D 06 | Y | 1.6241830D 08 | Z | 9.8387427D 07 |
| DX- | 4.3476901D 02 | DY- | 1.4629428D 03 | DZ- | 7.4262182D 02 |
| R | 1.8999563D 08 | DEC | 3.1187504D 01 | RA | 8.7810762D 01 |
| V | 1.6972663D 03 | PTH- | 7.6355800D 01 | AZ | 7.1003889D 01 |
| ALT | 1.8362320D 08 | LTGD | 3.1193213D 01 | LON | 2.0376424D 02 |
| VE | 1.1592488D 04 | PTE- | 8.1796817D 00 | AZE- | 8.9348423D 01 |

| | | | | | |
|----------------------|---------------|---------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 3 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.6793009D 05 |
| X | 5.4257054D 06 | Y | 1.5976962D 08 | Z | 9.7041372D 07 |
| DX- | 4.3545554D 02 | DY- | 1.4801219D 03 | DZ- | 7.5305404D 02 |
| R | 1.8701015D 08 | DEC | 3.1259139D 01 | RA | 8.8055003D 01 |
| V | 1.7168205D 03 | PTH- | 7.6292623D 01 | AZ | 7.1134746D 01 |
| ALT | 1.8063774D 08 | LTGD | 3.1264947D 01 | LON | 1.9648795D 02 |
| VE | 1.1395820D 04 | PTE- | 8.4161302D 00 | AZE- | 8.9330547D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 4 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.6973009D 05 |
| X | 4.6413118D 06 | Y | 1.5708953D 08 | Z | 9.5676214D 07 |
| DX | -4.3608240D 02 | DY | -1.4978557D 03 | DZ | -7.6385171D 02 |
| R | 1.8399076D 08 | DEC | 3.1332622D 01 | RA | 8.8307647D 01 |
| V | 1.7370115D 03 | PTH | -7.6226420D 01 | AZ | 7.1270026D 01 |
| ALT | 1.7761837D 08 | LTGD | 3.1338532D 01 | LON | 1.8922006D 02 |
| VE | 1.1197112D 04 | PTE | -8.6656508D 00 | AZE | -8.9311708D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 4 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.7153009D 05 |
| X | 3.8558485D 06 | Y | 1.5437699D 08 | Z | 9.4291273D 07 |
| DX | -4.3664300D 02 | DY | -1.5161777D 03 | DZ | -7.7503812D 02 |
| R | 1.8093636D 08 | DEC | 3.1408045D 01 | RA | 8.8569225D 01 |
| V | 1.7578783D 03 | PTH | -7.6156986D 01 | AZ | 7.1410040D 01 |
| ALT | 1.7456400D 08 | LTGD | 3.1414063D 01 | LON | 1.8196110D 02 |
| VE | 1.0996308D 04 | PTE | -8.9293418D 00 | AZE | -8.9291829D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 5 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.7333009D 05 |
| X | 3.0694412D 06 | Y | 1.5163091D 08 | Z | 9.2885828D 07 |
| DX | -4.3712992D 02 | DY | -1.5351244D 03 | DZ | -7.8663875D 02 |
| R | 1.7784581D 08 | DEC | 3.1485508D 01 | RA | 8.8840324D 01 |
| V | 1.7794634D 03 | PTH | -7.6084101D 01 | AZ | 7.1555127D 01 |
| ALT | 1.7147347D 08 | LTGD | 3.1491640D 01 | LON | 1.7471167D 02 |
| VE | 1.0793354D 04 | PTE | -9.2084268D 00 | AZE | -8.9270826D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 5 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.7513009D 05 |
| X | 2.2822300D 06 | Y | 1.4885014D 08 | Z | 9.1459108D 07 |
| DX | -4.3753480D 02 | DY | -1.5547357D 03 | DZ | -7.9868154D 02 |
| R | 1.7471789D 08 | DEC | 3.1565120D 01 | RA | 8.9121582D 01 |
| V | 1.8018136D 03 | PTH | -7.6007520D 01 | AZ | 7.1705658D 01 |
| ALT | 1.6834558D 08 | LTGD | 3.1571371D 01 | LON | 1.6747239D 02 |
| VE | 1.0588190D 04 | PTE | -9.5042729D 00 | AZE | -8.9248602D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 6 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.7693009D 05 |
| X | 1.4943708D 06 | Y | 1.4603344D 08 | Z | 9.0010291D 07 |
| DX | -4.3784813D 02 | DY | -1.5750553D 03 | DZ | -8.1119717D 02 |
| R | 1.7155131D 08 | DEC | 3.1646997D 01 | RA | 8.9413704D 01 |
| V | 1.8249797D 03 | PTH | -7.5926977D 01 | AZ | 7.1862042D 01 |
| ALT | 1.6517902D 08 | LTGD | 3.1653372D 01 | LON | 1.6024398D 02 |
| VE | 1.0380756D 04 | PTE | -9.8184121D 00 | AZE | -8.9225055D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 6 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.7873009D 05 |
| X | 7.0603806D 05 | Y | 1.4317949D 08 | Z | 8.8538494D 07 |
| DX | -4.3805914D 02 | DY | -1.5961311D 03 | DZ | -8.2421948D 02 |
| R | 1.6834467D 08 | DEC | 3.1731262D 01 | RA | 8.9717464D 01 |
| V | 1.8490181D 03 | PTH | -7.5842179D 01 | AZ | 7.2024729D 01 |
| ALT | 1.6197242D 08 | LTGD | 3.1737768D 01 | LON | 1.5302721D 02 |
| VE | 1.0170991D 04 | PTE | -1.0152566D 01 | AZE | -8.9200066D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 7 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.8053009D 05 |
| X | -8.2573357D 04 | Y | 1.4028688D 08 | Z | 8.7042774D 07 |
| DX | -4.3815555D 02 | DY | -1.6180158D 03 | DZ | -8.3778586D 02 |
| R | 1.6509652D 08 | DEC | 3.1818051D 01 | RA | 9.0033720D 01 |
| V | 1.8739905D 03 | PTH | -7.5752802D 01 | AZ | 7.2194215D 01 |
| ALT | 1.5872429D 08 | LTGD | 3.1824696D 01 | LON | 1.4582293D 02 |
| VE | 9.9588300D 03 | PTE | -1.0508678D 01 | AZE | -8.9173504D 01 |

| | | | | | |
|----------------------|----------------|---------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 7 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.8233009D 05 |
| X | -8.7124478D 05 | Y | 1.3735411D 08 | Z | 8.5522114D 07 |
| DX | -4.3812332D 02 | DY | -1.6407677D 03 | DZ | -8.6193776D 02 |
| R | 1.6180526D 08 | DEC | 3.1907511D 01 | RA | 9.0363420D 01 |
| V | 1.8999654D 03 | PTH | -7.5658487D 01 | AZ | 7.2371052D 01 |
| ALT | 1.5543307D 08 | LTGD | 3.1914301D 01 | LON | 1.3863210D 02 |
| VE | 9.7442070D 03 | PTE | -1.0888945D 01 | AZE | -8.9145224D 01 |

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TABLE 10-LXXXVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 1 APRIL 1968 1 HRS., 33 MIN., 50.054 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.39287740 04
X 1.73323200 06 Y-5.84672410 06 Z-2.75524520 06
DX 1.06270870 04 DY 7.31210880 02 DZ 2.06740330 03
R 6.69176010 06 DEC-2.43139960 01 RA-7.34878040 01
V 1.08509810 04 PTH 6.68101220 00 AZ 7.47266570 01
ALT 3.17235010 05 LTGD-2.44518090 01 LON 7.35760320 01
VE 1.04256890 04 PTE 6.91704400 00 AZE 7.40619810 01

PERISELENUM

TIME 4 APRIL 1968 3 HRS., 52 MIN., 28.603 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 2.30782560 05 YSC 1.71641150 06 ZSC 7.68558370 05
DXSC 2.49282750 03 DYSC-2.70096110 02 DZSC-1.45343640 02
RSC 1.89473240 06 DESC 2.39305470 01 RASC 8.23421370 01
VSC 2.51162610 03 PTSC 9.91261310-13 AZSC-9.36298560 01
SELENOGRAPHIC REFERENCE
XSG-1.88942990 06 YSG 1.23918450 05 ZSG 6.86281510 04
DXSG 1.62631300 02 DYSG 2.51077770 03 DZSG-5.61175940 01
HSG 1.56642890 05 LTSG 2.07573560 00 LNSG 1.76247610 02
VRSG 2.51666500 03 PTSG 6.67709630-09 AZSG-9.12785440 01
LTS-1.45870560-01 LNS 1.07571170 02 LTE-6.13844430 00
LNF-4.47515170 00 DSMP 3.92929570-01 RSMP 1.11897000 02
LTN 1.77560900 02 LAN-6.20605550 01 LAP 1.21668600 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.81447320 05
X 5.38355150 07 Y 3.53703910 08 Z 1.89741570 08
DX 1.52777550 03 DY-1.94443820 02 DZ-7.18472630 01
R 4.04977270 08 DEC 2.79385280 01 RA 8.13457110 01
V 1.54177440 03 PTH-1.46244380-02 AZ-9.30158770 01
ALT 3.98603790 08 LTGD 2.79410300 01 LON 1.90697160 02
VE 2.76293030 04 PTE-8.23420820-04 AZE-9.01682100 01

FREE-RETURN VACUUM PERIGEE

TIME 7 APRIL 1968 4 HRS., 38 MIN., 48.627 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.434277350 05
X-1.80018260 06 Y-5.58665340 06 Z-2.51944610 06
DX 9.34971050 03 DY-2.89248520 02 DZ-5.99878420 03
R 6.38740650 06 DEC-2.32310260 01 RA-1.07860450 02
V 1.11124330 04 PTH-8.20466380-02 AZ 1.26020270 02
ALT 1.25832200 04 LTGD-2.33705440 01 LON 3.46918940 02
VE 1.07691950 04 PTE 2.96049750-12 AZE 1.27359610 02

TABLE 10-LXXXIX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 22 HRS., 10 MIN., 41.580 SEC. G. M. T.

RESTART SEQUENCE INITIATION
GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -5.479391E 06 | YYY -8.465980E 03 | 777 3.628911F 06 | 1.305800E 04 |
| DXX -4.304870E 03 | DYY -1.669423E 01 | DZ7 -6.496229F 03 | |
| R 6.572122E 06 | WT 2.978662E 05 | F 1.880976E 01 | |
| V 7.793150E 03 | PTH 1.562548E-02 | A7 9.967777E 01 | |
| ALT 1.987777E 05 | LAT -2.828930E 01 | LON 6.553946E 00 | |
| VF 7.377488E 03 | PTE 1.650588E-02 | A7E 1.002287E 02 | |
| ANG 3.909861E 00 | NFA 9.802533E 01 | IAC 9.233132E 00 | |
| CPA 1.196613E 02 | VPA 1.196613E 02 | CYA -1.174781E-01 | |
| VYA -1.174781E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -6.568737E 06 | YYY -1.578183E 04 | Z7Z 2.603764E 05 | 1.351800E 04 |
| DXX -3.140710E 02 | DYY -1.434855E 01 | DZ7 -7.791503E 03 | |
| R 6.573914E 06 | WT 2.967311E 05 | F 2.073030E 05 | |
| V 7.797843E 03 | PTH 3.862021E-02 | AZ 8.213834E 01 | |
| ALT 2.007307E 05 | LAT -2.880314E 01 | LON 4.033336E 01 | |
| VF 7.381946E 03 | PTF 4.079599E-02 | A7E 8.169237E 01 | |
| ANG 3.897728E 00 | NFA 8.328066E 01 | IAC 1.186195E 01 | |
| CPA 8.843832E 01 | VPA 8.843832E 01 | CYA -9.590888E-02 | |
| VYA -9.590888E-02 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -6.150762E 06 | YYY -1.989646E 04 | 77Z -2.631283E 06 | 1.383772E 04 |
| DXX 3.078186E 03 | DYY -1.229353E 01 | DZ7 -1.040639E 04 | |
| R 6.689986E 06 | WT 1.395862E 05 | F 2.060472E 05 | |
| V 1.085211E 04 | PTH 6.683202E 00 | A7 7.003745E 01 | |
| ALT 3.149805E 05 | LAT -2.255883E 01 | LON 6.642534E 01 | |
| VF 1.043279E 04 | PTF -6.953116E 00 | A7E 6.918647E 01 | |
| ANG 2.462733E 00 | NFA 7.231970E 01 | IAC 1.638217E 01 | |
| CPA 7.144445E 01 | VPA 7.144355E 01 | CYA -1.628472E-01 | |
| VYA -1.628114E-01 | CRA -0.000000E-39 | VRA 0.000000E-39 | |

TABLE 10-LXXXIX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 1 APRIL 1968 2 HRS., 1 MIN., 19.295 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.3837715D 04

| | | |
|-------------------|--------------------|-------------------|
| X 1.7289199D 06 | Y-5.9311709D 06 | Z-2.5667030D 06 |
| DX 1.0447439D 04 | DY 3.5994620D 02 | DZ 2.9137264D 03 |
| R 6.6899862D 06 | DEC-2.2560787D 01 | RA-7.3748739D 01 |
| V 1.0852113D 04 | PTH 6.6832022D 00 | AZ 7.0036928D 01 |
| ALT 3.1498221D 05 | LTGD-2.2690981D 01 | LON 6.6424446D 01 |
| VE 1.0432802D 04 | PTE 6.9068331D 00 | AZE 6.9171140D 01 |

PERISELENUM

TIME 4 APRIL 1968 4 HRS., 38 MIN., 52.639 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC 2.3143593D 05 | YSC 1.7161422D 06 | ZSC 7.6697977D 05 |
| DXSC 2.4915460D 03 | DYSC-2.5140343D 02 | DZSC-1.8929995D 02 |
| RSC 1.8939283D 06 | DESC 2.3889101D 01 | RASC 8.2319524D 01 |
| VSC 2.5113422D 03 | PTSC 2.0818234D-12 | AZSC-9.4728860D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8876524D 06 | YSG 1.3859888D 05 | ZSG 6.7255824D 04 |
| DXSG 1.8042806D 02 | DYSG 2.5077491D 03 | DZSG-1.0386863D 02 |
| HSG 1.5583884D 05 | LTSG 2.0350744D 00 | LNSG 1.7580064D 02 |
| VRSG 2.5163760D 03 | PTSG 1.8865505D-09 | AZSG-9.2367163D 01 |
| LTS-1.4523934D-01 | LNS 1.0717798D 02 | LTE-6.1587041D 00 |
| LNE-4.5140037D 00 | DSMP 3.9001980D-01 | RSMP 1.1154420D 02 |
| LIN 1.7687508D 02 | LAN-4.4806609D 01 | LAP 1.3935059D 02 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.8249106D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.1148229D 07 | Y 3.5390582D 08 | Z 1.8994008D 08 |
| DX 1.5256396D 03 | DY-1.8181963D 02 | DZ-1.1906356D 02 |
| R 4.0489838D 08 | DEC 2.7976249D 01 | RA 8.1776267D 01 |
| V 1.5410420D 03 | PTH-8.1986271D-01 | AZ-9.4582393D 01 |
| ALT 3.9852492D 08 | LTGD 2.7978754D 01 | LON 1.7949581D 02 |
| VE 2.7611592D 04 | PTE-4.5767309D-02 | AZE-9.0255445D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 7 APRIL 1968 5 HRS., 6 MIN., 4.117 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.4332254D 05

| | | |
|-------------------|--------------------|-------------------|
| X-1.8097059D 06 | Y-5.5842854D 06 | Z-2.5965285D 06 |
| DX 9.7663934D 03 | DY-7.3451574D 02 | DZ-5.1924452D 03 |
| R 6.4188191D 06 | DEC-2.3860931D 01 | RA-1.0795601D 02 |
| V 1.1085280D 04 | PTH-7.2649907D-02 | AZ 1.2084696D 02 |
| ALT 4.4168448D 04 | LTGD-2.4002618D 01 | LON 3.3999018D 02 |
| VE 1.0720020D 04 | PTE-1.3294248D-12 | AZE 1.2202022D 02 |

TABLE 10-XC TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 22 HRS..16 MIN..13.130 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.304300E 04 |
|----------------------|-------------------|-------------|---------------|--------------|
| XXX -5.411157E 06 | YYY -3.450213E 04 | 777 | 3.728169F 06 | |
| DXX -4.423326E 03 | DYY 3.571109E 01 | 077 | -6.415852F 03 | |
| R 6.571230E 06 | WT 2.966883E 05 | F | 1.886216E 01 | |
| V 7.792962E 03 | PTH 1.644447E-02 | A7 | 9.355948E 01 | |
| ALT 1.994095E 05 | LAT -3.294423E 01 | LON | 4.742921F 00 | |
| VE 7.391650E 03 | PTE 1.733759E-02 | AZE | 9.375300E 01 | |
| ANG 3.875743E 00 | NFA 9.258176E 01 | IAC | 9.232621E 00 | |
| CPA 1.207138E 02 | VPA 1.207138E 02 | CYA | 2.822687E-01 | |
| VYA 2.822687E-01 | CRA -0.000000E-39 | VRA | -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.350300E 04 |
|----------------------|-------------------|-------------|---------------|--------------|
| XXX -6.562156E 06 | YYY -1.519325E 04 | 777 | 3.802111F 05 | |
| DXX -4.569055E 02 | DYY 4.628632E 01 | 077 | -7.784694E 03 | |
| R 6.573179E 06 | WT 2.955531E 05 | F | 2.073030E 05 | |
| V 7.798228E 03 | PTH 4.220089E-02 | A7 | 7.412535E 01 | |
| ALT 2.002039E 05 | LAT -2.945765E 01 | LON | 3.930989E 01 | |
| VE 7.397670E 03 | PTE 4.448593E-02 | A7F | 7.324113F 01 | |
| ANG 3.971820E 00 | NFA 7.701733E 01 | IAC | 1.188117F 01 | |
| CPA 8.948894E 01 | VPA 8.948894E 01 | CYA | 3.482611F-01 | |
| VYA 3.482611E-01 | CRA -0.000000E-39 | VRA | -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.382169E 04 |
|----------------------|-------------------|-------------|---------------|--------------|
| XXX -6.199490E 06 | YYY 2.113705E 03 | 777 | -2.509369F 06 | |
| DXX 2.880971E 03 | DYY 5.490164E 01 | 077 | -1.046377E 04 | |
| R 6.688095E 06 | WT 1.390542E 05 | F | 2.060472F 05 | |
| V 1.085327E 04 | PTH 6.642517E 00 | A7 | 6.297707F 01 | |
| ALT 3.124454E 05 | LAT -2.001805E 01 | LON | 6.397432F 01 | |
| VE 1.044998E 04 | PTE 6.900507E 00 | A7F | 6.182714F 01 | |
| ANG 2.410236E 00 | NFA 7.532202E 01 | IAC | 1.643717F 01 | |
| CPA 7.253401E 01 | VPA 7.253314E 01 | CYA | -2.415189F-01 | |
| VYA -2.414993E-01 | CRA -0.000000E-39 | VRA | 0.000000E-39 | |

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TABLE 10-XC TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 1 APRIL 1968 2 HRS., 6 MIN., 34.820 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.3821690D 04
X 1.6389558D 06 Y-6.0664564D 06 Z-2.2896593D 06
DX 1.0016053D 04 DY-2.5292561D 02 DZ 4.1723218D 03
R 6.6880946D 06 DEC-2.0020022D 01 RA-7.4881508D 01
V 1.0853274D 04 PTH 6.6429167D 00 AZ 6.2976596D 01
ALT 3.1244701D 05 LTGD-2.0138288D 01 LON 6.3973390D 01
VE 1.0449992D 04 PTE 6.8446512D 00 AZE 6.1814094D 01

PERISELENUM
TIME 4 APRIL 1968 5 HRS., 8 MIN., 55.800 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 2.5100819D 05 YSC 1.6601016D 06 ZSC 7.4344642D 05
DXSC 2.5156910D 03 DYSC-2.5506696D 02 DZSC-2.7980762D 02
RSC 1.8362067D 06 DESC 2.3883711D 01 RASC 8.1401972D 01
VSC 2.5440229D 03 PTSC 1.6503514D-12 AZSC-9.6908634D 01
SELENOGRAPHIC REFERENCE
XSG-1.8271278D 06 YSG 1.6992443D 05 ZSG 6.6216525D 04
DXSG 2.2868982D 02 DYSG 2.5317432D 03 DZSG-1.8665291D 02
HSG 9.8117164D 04 LTSG 2.0666247D 00 LNSG 1.7468672D 02
VRSG 2.5488943D 03 PTSG-3.6654076D-09 AZSG-9.4202203D 01
LTS-1.4483008D-01 LNS 1.0692332D 02 LTE-6.1716822D 00
LNE-4.5390811D 00 DSMP 3.8813500D-01 RSMP 1.1131563D 02
LIN 1.7531070D 02 LAN-3.1411912D 01 LAP 1.5382538D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8396267D 05
X 4.9425636D 07 Y 3.5397170D 08 Z 1.9004128D 08
DX 1.5492553D 03 DY-1.8941736D 02 DZ-2.1168552D 02
R 4.0478951D 08 DEC 2.8000659D 01 RA 8.2051088D 01
V 1.5750815D 03 PTH-2.7603212D 00 AZ-9.7282094D 01
ALT 3.9841605D 08 LTGD 2.8003166D 01 LCN 1.7223689D 02
VE 2.7623825D 04 PTE-1.5734803D-01 AZE-9.0413613D 01

FREE-RETURN VACUUM PERIGEE
TIME 7 APRIL 1968 4 HRS., 43 MIN., 36.107 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.4164298D 05
X-2.1808206D 06 Y-6.2875486D 06 Z-3.0655764D 06
DX 9.6064126D 03 DY-1.5822643D 03 DZ-3.5677557D 03
R 7.3271416D 06 DEC-2.4732754D 01 RA-1.0912897D 02
V 1.0368973D 04 PTH-4.8318813D-02 AZ 1.1228531D 02
ALT 9.5273320D 05 LTGD-2.4860171D 01 LON 3.4444931D 02
VE 9.9216367D 03 PTE 5.0574032D-13 AZE 1.1334817D 02

TABLE 10-XCI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGRFES - FIRST OPPORTUNITY

LAUNCH TIME = 19 HRS., 25 MIN., 16.550 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.577000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -6.109458E 06 | YYY | -8.188908E 04 | ZZZ | -2.432408E 06 |
| DXX | 2.877200E 03 | DYY | -1.358500E 02 | DZZ | -7.234123E 03 |
| R | 6.576419E 06 | WT | 2.973373E 05 | F | 1.680949E 01 |
| V | 7.786480E 03 | PTH | 3.269180E-02 | AZ | 9.408827E 01 |
| ALT | 2.043893E 05 | LAT | -3.232830E 01 | LON | 8.844849E 01 |
| VE | 7.382340E 03 | PTF | 3.448144E-02 | AZF | 9.431249E 01 |
| ANG | 3.878274E 00 | NFA | 9.253807E 01 | IAC | 9.218464E 00 |
| CPA | 6.444076E 01 | VPA | 6.444076E 01 | CYA | -9.492844E-01 |
| VYA | -9.492844E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.037000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -3.966651E 06 | YYY | -1.308015E 05 | ZZZ | -5.246397E 06 |
| DXX | 6.213300E 03 | DYY | -7.150797E 01 | DZZ | -4.700841E 03 |
| R | 6.578458E 06 | WT | 2.962041E 05 | F | 2.073030E 05 |
| V | 7.791542E 03 | PTH | 2.888354E-02 | AZ | 7.498475E 01 |
| ALT | 2.054138E 05 | LAT | -2.924025E 01 | LON | 1.228353E 02 |
| VF | 7.388046E 03 | PTF | 3.046108E-02 | AZE | 7.414370E 01 |
| ANG | 3.961761E 00 | NFA | 7.656189E 01 | IAC | 1.186076E 01 |
| CPA | 3.324097E 01 | VPA | 3.324097E 01 | CYA | -4.477744E-01 |
| VYA | -4.477744E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.370149E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -1.251871E 06 | YYY | -1.324165E 05 | ZZZ | -6.583040E 06 |
| DXX | 1.032049E 04 | DYY | 1.748717E 02 | DZZ | -3.312447E 03 |
| R | 6.702323E 06 | WT | 1.391799E 05 | F | 2.060472E 05 |
| V | 1.084045E 04 | PTH | 7.006618E 00 | AZ | 6.457083E 01 |
| ALT | 3.266313E 05 | LAT | -1.984037E 01 | LON | 1.485626E 02 |
| VF | 1.043035E 04 | PTF | 7.283568E 00 | AZF | 6.347756E 01 |
| ANG | 7.515220E 00 | NFA | 8.945279E 00 | IAC | 1.622153E 01 |
| CPA | 1.688229E 01 | VPA | 1.688307E 01 | CYA | 7.258761E 00 |
| VYA | 7.258735E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

TABLE 10- XCI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 2 APRIL 1968 22 HRS., 1 MIN., 26.699 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 9.3701491D 03
 X 4.0714733D 06 Y-4.8134009D 06 Z-2.2749531D 06
 DX 9.2349698D 03 DY 4.1283094D 03 DZ 3.8971494D 03
 R 6.7721230D 06 DEC-1.9842000D 01 RA-4.9773382D 01
 V 1.0000451D 04 PTH 7.0066173D 00 AZ 6.4569538D 01
 ALT 3.4001267D 05 LTGD-1.9959141D 01 LON 1.4856188D 02
 VE 1.4000361D 04 PTE 7.2312369D 00 AZE 6.3462878D 01

PERISELENUM

TIME 5 APRIL 1968 23 HRS., 29 MIN., 8.412 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-4.8000000D 05 YSC 1.6468180D 06 ZSC 7.2639371D 05
 DXSC 2.4000000D 03 DYSC 5.5994419D 02 DZSC 3.4888137D 02
 RSC 1.0000000D 06 DECS 2.2949878D 01 RASC 1.0626153D 02
 VSC 2.0000000D 03 PTSC-8.2208925D-13 AZSC-8.1403179D 01

SELENOGRAPHIC REFERENCE

XSG-1.0000000D 06 YSG 1.8629518D 05 ZSG 6.1780530D 04
 DXSG 2.0000000D 03 DYSG 2.5248361D 03 DZSG 9.1707627D 01
 HSG 1.0000000D 05 LTSG 1.9004818D 00 LNSG 1.7425750D 02
 VRSG 2.0000000D 03 PTSG-7.3155954D-09 AZSG-8.7929342D 01
 LTS-1.0000000D-01 LNS 8.5406785D 01 LTE-6.8303400D 00
 LNE-6.3460394D 00 DSMP 2.2832100D-01 RSMP 9.1727487D 01
 LIN 1.7718673D 02 LAN-1.4326903D 02 LAP 4.2507867D 01

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7383186D 05
 X-9.8429680D 07 Y 3.3833651D 08 Z 1.8651170D 08
 DX 1.5065949D 03 DY 2.8916639D 02 DZ 2.3379820D 02
 R 3.9868108D 08 DEC 2.7892995D 01 RA 1.0622089D 02
 V 1.5518076D 03 PTH-6.3457928D-01 AZ-7.9843392D 01
 ALT 3.9230759D 08 LTGD 2.7895534D 01 LON 2.7961546D 02
 VE 2.7223524D 04 PTE-3.6146320D-02 AZE-8.9424095D 01

FREE-RETURN VACUUM PERIGEE

TIME 8 APRIL 1968 21 HRS., 55 MIN., 47.906 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.2743136D 05
 X 6.5911422D 05 Y-6.6536575D 06 Z-2.9441999D 06
 DX 8.6656040D 03 DY 3.0202732D 03 DZ-4.8570818D 03
 R 7.3057445D 06 DEC-2.3765726D 01 RA-8.4342707D 01
 V 1.0382966D 04 PTH-6.3463821D-02 AZ 1.2077215D 02
 ALT 9.3106514D 05 LTGD-2.3889769D 01 LON 1.0949431D 02
 VE 9.9671666D 03 PTE-1.6134428D-12 AZE 1.2220632D 02

TABLE 10-XCII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 21 HRS., 18 MIN., 40.140 SEC. G. M. T.

RFSTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.566661E 06 | YYY | -2.220960E 04 | 727 2.696362E 05 |
| DXX | -3.235364E 02 | DYY | -1.026436E 02 | DZ7 -7.783975E 03 |
| R | 6.572232E 06 | WT | 2.986969E 05 | F 1.812637E 01 |
| V | 7.791372E 03 | PTH | 3.132081E-02 | AZ 9.948113E 01 |
| ALT | 1.988050E 05 | LAT | -2.802458E 01 | LON 6.246377E 01 |
| VE | 7.374420E 03 | PTF | 3.309181E-02 | AZF 1.000226E 02 |
| ANG | 3.909404E 00 | NFA | 9.772340E 01 | IAC 9.232986E 00 |
| CPA | 8.850980E 01 | VPA | 8.850980E 01 | CYA -7.400749E-01 |
| VYA | -7.400749E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.756456E 06 | YYY | -6.513420E 04 | Z77 -3.175420E 06 |
| DXX | 3.761223E 03 | DYY | -7.942252E 01 | D77 -6.827603E 03 |
| R | 6.574520E 06 | WT | 2.975625E 05 | F 2.073030E 05 |
| V | 7.795465E 03 | PTH | 3.841592E-02 | A7 8.215966E 01 |
| ALT | 2.012377E 05 | LAT | -2.848851E 01 | LON 9.613092E 01 |
| VE | 7.378258E 03 | PTF | 4.058755E-02 | AZE 8.171329E 01 |
| ANG | 3.897791E 00 | NFA | 8.281375E 01 | IAC 1.184866E 01 |
| CPA | 5.728031E 01 | VPA | 5.728031E 01 | CYA -5.441398E-01 |
| VYA | -5.441398E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.806433E 06 | YYY | -8.289500E 04 | Z77 -5.510589E 06 |
| DXX | 8.116101E 03 | DYY | 2.596736E 01 | D77 -7.192734E 03 |
| R | 6.697940E 06 | WT | 1.400261E 05 | F 2.060472E 05 |
| V | 1.084468E 04 | PTH | 6.911340E 00 | A7 7.030514E 01 |
| ALT | 3.227833E 05 | LAT | -2.198551E 01 | LON 1.231908E 02 |
| VE | 1.042262E 04 | PTF | 7.192666E 00 | A7F 6.945939E 01 |
| ANG | 4.343156E 00 | NFA | 2.800587E 01 | IAC 1.626579E 01 |
| CPA | 3.978244E 01 | VPA | 3.978170E 01 | CYA 3.130217E 00 |
| VYA | 3.130291E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

D5-15481-1

TABLE 10- XCII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 2 APRIL 1968 23 HRS., 48 MIN., 53.110 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 9.0129701D 03
X 4.1387627D 06 Y-4.6308219D 06 Z-2.5076937D 06
DX 9.2691379D 03 DY 4.8393231D 03 DZ 2.8759734D 03
R 6.6979396D 06 DEC-2.1987095D 01 RA-4.8211482D 01
V 1.0844685D 04 PTH 6.9113411D 00 AZ 7.0303781D 01
ALT 3.2278491D 05 LTGD-2.2114523D 01 LON 1.2319020D 02
VE 1.0422627D 04 PTE 7.1479323D 00 AZE 6.9442976D 01

PERISELENUM

TIME 6 APRIL 1968 0 HRS., 39 MIN., 41.870 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-5.3134533D 05 YSC 1.6472690D 06 ZSC 7.3181804D 05
DXSC 2.4212028D 03 DYSC 5.8887686D 02 DZSC 4.3242467D 02
RSC 1.8791968D 06 DESC 2.2919116D 01 RASC 1.0787769D 02
VSC 2.5290295D 03 PTSC-2.0399852D-12 AZSC-7.9301567D 01
SELENOGRAPHIC REFERENCE
XSG-1.8711190D 06 YSG 1.6059956D 05 ZSG 6.7099666D 04
DXSG 2.2191992D 02 DYSG 2.5192965D 03 DZSG 1.5857973D 02
HSG 1.4110734D 05 LTSG 2.0462704D 00 LNSG 1.7509427D 02
VRSG 2.5340187D 03 PTSG-1.2884490D-08 AZSG-8.6409769D 01
LTS-1.0737435D-01 LNS 8.4809383D 01 LTE-6.8354706D 00
LNE-6.3854890D 00 DSMP 2.2387192D-01 RSMP 9.1173602D 01
LIN 1.7586211D 02 LAN-1.5531034D 02 LAP 2.9659629D 01
GEOCENTRIC REFERENCE FLIGHT TIME 217126173D 05
X-1.0245693D 08 Y 3.3717104D 08 Z 1.8601911D 08
DX 1.4833410D 03 DY 3.0884843D 02 DZ 3.1223481D 02
R 3.9847816D 08 DEC 2.7828321D 01 RA 1.0690257D 02
V 1.5469901D 03 PTH 9.5160767D-01 AZ-7.7320817D 01
ALT 3.9210465D 08 LTGD 2.7830857D 01 LON 2.6260943D 02
VE 2.7208185D 04 PTE 5.4135226D-02 AZE-8.9285040D 01

FREE-RETURN VACUUM PERIGEE

TIME 8 APRIL 1968 23 HRS., 35 MIN., 0.238 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 512658010D 05
X 8.1720697D 05 Y-6.2644370D 06 Z-2.6809584D 06
DX 8.0514047D 03 DY 3.6567990D 03 DZ-6.0525354D 03
R 6.8628373D 06 DEC-2.2994867D 01 RA-8.2567630D 01
V 1.0715899D 04 PTH-7.9099805D-02 AZ 1.2789085D 02
ALT 4.8794885D 05 LTGD-2.3123661D 01 LON 8.6400105D 01
VE 1.0356204D 04 PTE-1.1074201D-12 AZE 1.2945644D 02

TABLE 10-XCIII TRANSLUNAR TRAJECTRY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 22 HRS..55 MIN..04.680 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -6.048458E 06 | YYY -2.598901E 03 | ZZZ 2.562946E 06 | 03 |
| DXX -3.043705E 03 | DYY -4.387403E 01 | DZZ -7.175743E 03 | 03 |
| R 6.569059E 06 | WT 2.992307E 05 | F 1.927066E 01 | 01 |
| V 7.794700E 03 | PTH 2.102726E-02 | AZ 1.016882E 02 | 02 |
| ALT 1.950594E 05 | LAT -2.613749E 01 | LON 4.057933E 01 | 01 |
| VE 7.374094E 03 | PTF 2.222663E-02 | A7F 1.023651E 02 | 02 |
| ANG 3.929869E 00 | NFA 9.988210E 01 | IAC 9.243050E 00 | 00 |
| CPA 1.091149E 02 | VPA 1.091149E 02 | CYA -3.202454E-01 | 01 |
| VYA -3.202454E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -6.502103E 06 | YYY -2.260589E 04 | ZZZ -9.486499E 05 | 05 |
| DXX 1.121019E 03 | DYY -4.103680E 01 | DZZ -7.717870E 03 | 03 |
| R 6.570981E 06 | WT 2.980952E 05 | F 2.073030E 05 | 05 |
| V 7.798967E 03 | PTH 3.745677E-02 | A7 8.520470E 01 | 01 |
| ALT 1.975729E 05 | LAT -2.808504E 01 | LON 7.383514E 01 | 01 |
| VE 7.377789E 03 | PTF 3.959551E-02 | A7F 8.493025E 01 | 01 |
| ANG 3.881845E 00 | NFA 8.572589E 01 | IAC 1.184905E 01 | 01 |
| CPA 7.786557E 01 | VPA 7.786557E 01 | CYA -2.875049E-01 | 01 |
| VYA -2.875049E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -5.490675E 06 | YYY -3.297882E 04 | ZZZ -3.830823E 06 | 06 |
| DXX 5.088511E 03 | DYY 3.891981E 00 | DZZ -9.579869E 03 | 03 |
| R 6.695058E 06 | WT 1.403304E 05 | F 2.060472E 05 | 05 |
| V 1.084743E 04 | PTH 6.927377E 00 | AZ 7.275858E 01 | 01 |
| ALT 3.201302E 05 | LAT -2.285253E 01 | LON 1.013956E 02 | 02 |
| VE 1.042188E 04 | PTF 7.211716E 00 | A7E 7.201962E 01 | 01 |
| ANG 3.046566E 00 | NFA 4.580441E 01 | IAC 1.625436E 01 | 01 |
| CPA 6.012218E 01 | VPA 6.012155E 01 | CYA 1.410309E 00 | 00 |
| VYA 1.410316E 00 | CRA -0.000000E-39 | VRA 0.000000E-39 | 39 |

TABLE 10- XCIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH OF 90 DEGREES - FIRST OPPORTUNITY (CONTINUED)

TRANSLUNAR INJECTION

TIME 3 APRIL 1968 1 HRS., 20 MIN., 12.977 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 8.7082970D 03
 X 4.1987952D 06 Y-4.5202368D 06 Z-2.6002644D 06
 DX 8.1992959D 03 DY 5.2076068D 03 DZ 2.4332337D 03
 R 2.2550576D 06 DEC-2.2854087D 01 RA-4.7111345D 01
 V 1.2847435D 04 PTH 6.9273781D 00 AZ 7.2757172D 01
 ALT 3.2013181D 05 LTGD-2.2985496D 01 LON 1.0139505D 02
 VE 1.421887D 04 PTE 7.1711254D 00 AZE 7.2002393D 01

PERISELENUM

TIME 5 APRIL 1968 1 HRS., 49 MIN., 12.768 SEC., GMT
 SELENGENTRIC REFERENCE
 XSC 1.1110206D 05 YSC 1.6490743D 06 ZSC 7.8349978D 05
 DXSC 1.1110377D 05 YSC 6.1796804D 02 DZSC 4.7975454D 02
 RSC 1.1110700D 05 ESC 2.2796431D 01 RASC 1.0910803D 02
 VSC 1.1110240D 05 TSC 4.1670593D-12 AZSC-7.8101465D 01

SELENGENTRIC REFERENCE

XSG-1.1110297D 05 YSG 1.4517481D 05 ZSG 6.8341210D 04
 DXSG 2.1110784D 02 DYSG 2.5138061D 03 DZSG 1.9176979D 02
 HSG 1.1110750D 05 LTSG 2.0688285D 00 LNSG 1.7559901D 02
 VRSG 2.1110399D 03 RTSG-2.2002236D-08 AZSG-8.5648447D 01
 LTS-1.111015D-01 LNS 8.4220822D 01 LTE-6.8397895D 00
 LNE-6.4236870D 00 DSMP 2.1948832D-01 RSMP 9.0627264D 01
 LIN 1.11107476D 02 LAN-1.5906507D 02 LAP 2.5414665D 01

GEOCENTRIC REFERENCE

FLIGHT TIME 2.6964809D 05
 X-1.0640276D 08 Y 3.3598590D 08 Z 1.8550901D 08
 DX 1.4647009D 03 DY 3.2884217D 02 DZ 3.5453869D 02
 R 3.9827336D 08 DEC 2.7760915D 01 RA 1.0757237D 02
 V 1.5424602D 03 PTH 1.9037624D 00 AZ-7.5971900D 01
 ALT 3.9189983D 08 LTGD 2.7763448D 01 LON 2.4585292D 02
 VE 2.7197971D 04 PTE 1.0798180D-01 AZE-8.9212767D 01

FREE-RETURN VACUUM PERIGEE

TIME 9 APRIL 1968 1 HRS., 2 MIN., 12.080 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.2602740D 05
 X 9.3005090D 05 Y-6.0011912D 06 Z-2.5256786D 06
 DX 7.5718664D 03 DY 4.0504903D 03 DZ-6.7916511D 03
 R 6.5771074D 06 DEC-2.2582326D 01 RA-8.1190509D 01
 V 1.0948340D 04 PTH-8.9130486D-02 AZ 1.3225994D 02
 ALT 2.0210943D 05 LTGD-2.2714863D 01 LON 6.5918201D 01
 VE 1.0624770D 04 PTE 3.4693689D-12 AZE 1.3386620D 02

TABLE 10-XCIV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH OF 99 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 23 HRS., 33 MIN., 31.520 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.637827F 06 | YYY | -1.609542F 04 |
| DXX | -3.999997E 03 | DYY | 1.456188F 01 |
| R | 6.567334E 06 | WT | 2.988956F 05 |
| V | 7.795759E 03 | PTH | 1.524582F-02 |
| ALT | 1.941006E 05 | LAT | -2.864366F 01 |
| VF | 7.380316F 03 | PTF | 1.610445F-02 |
| ANG | 3.900566F 00 | NFA | 9.695167F 01 |
| CPA | 1.170005E 02 | VPA | 1.170005E 02 |
| VYA | 1.162595E-01 | CRA | -0.000000F-39 |
| | | 727 | 3.368164F 06 |
| | | 077 | -6.691312F 03 |
| | | F | 1.969944F 01 |
| | | A7 | 9.847198F 01 |
| | | L0N | 3.154400F 01 |
| | | A7E | 9.895268E 01 |
| | | IAC | 9.246389F 00 |
| | | CYA | 1.162595E-01 |
| | | VRA | -0.000000F-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.568880F 06 | YYY | -8.632980E 03 |
| DXX | 5.274268E 01 | DYY | 1.709430E 01 |
| R | 6.569066E 06 | WT | 2.577597E 05 |
| V | 7.800620E 03 | PTH | 3.702427F-02 |
| ALT | 1.957763E 05 | LAT | -2.846684E 01 |
| VF | 7.385109E 03 | PTF | 3.910752F-02 |
| ANG | 3.906335E 00 | NFA | 8.232941E 01 |
| CPA | 8.574259F 01 | VPA | 8.574259F 01 |
| VYA | 1.303594E-01 | CRA | -0.000000E-39 |
| | | 727 | -4.867954F 04 |
| | | 077 | -7.800423F 03 |
| | | F | 2.073030F 05 |
| | | AZ | 8.090383F 01 |
| | | L0N | 6.536950E 01 |
| | | A7E | 8.038732E 01 |
| | | IAC | 1.185865F 01 |
| | | CYA | 1.303594F-01 |
| | | VRA | -0.000000F-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.963167F 06 | YYY | 6.602375E 03 |
| DXX | 3.717394E 03 | DYY | 1.339369E 02 |
| R | 6.695271E 06 | WT | 1.401366E 05 |
| V | 1.084667E 04 | PTH | 7.000211F 00 |
| ALT | 3.199638E 05 | LAT | -2.139986F 01 |
| VF | 1.042603E 04 | PTF | 7.284140F 00 |
| ANG | 4.743126E 00 | NFA | 2.626349F 01 |
| CPA | 6.814351F 01 | VPA | 6.814300E 01 |
| VYA | 4.078997E 00 | CRA | -0.000000E-39 |
| | | 727 | -3.044214E 06 |
| | | 077 | -1.018888F 04 |
| | | F | 2.060472E 05 |
| | | AZ | 6.928549F 01 |
| | | L0N | 9.234905F 01 |
| | | A7E | 6.839467F 01 |
| | | IAC | 1.624897F 01 |
| | | CYA | 4.078976F 00 |
| | | VRA | 0.000000F-39 |

TABLE 10- XCIV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 3 APRIL 1968 1 HRS., 56 MIN., 42.994 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 8.5914742D 03

| | | |
|-------------------|--------------------|-------------------|
| X 4.2506821D 06 | Y-4.5595612D 06 | Z-2.4431030D 06 |
| DX 9.1523475D 03 | DY 4.9498645D 03 | DZ 3.0632839D 03 |
| R 6.6952706D 06 | DEC-2.1401416D 01 | RA-4.7007913D 01 |
| V 1.0846674D 04 | PTH 7.0002119D 00 | AZ 6.9284092D 01 |
| ALT 3.1996522D 05 | LTGD-2.1526176D 01 | LON 9.2348427D 01 |
| VE 1.0426039D 04 | PTE 7.2381784D 00 | AZE 6.8378451D 01 |

PERISELENUM
TIME 6 APRIL 1968 2 HRS., 48 MIN., 28.547 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-5.7148059D 05 | YSC 1.6499036D 06 | ZSC 7.3387317D 05 |
| DXSC 2.3989351D 03 | DYSC 6.3176259D 02 | DZSC 4.4806308D 02 |
| RSC 1.8938342D 06 | DESC 2.2783029D 01 | RASC 1.0910465D 02 |
| VSC 2.5208677D 03 | PTSC 2.5426996D-12 | AZSC-7.8884758D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8855730D 06 | YSG 1.6312904D 05 | ZSG 6.7909294D 04 |
| DXSG 2.2291042D 02 | DYSG 2.5111239D 03 | DZSG 1.5721905D 02 |
| HSG 1.5574476D 05 | LTSG 2.0549581D 00 | LNSG 1.7505540D 02 |
| VRSG 2.5258959D 03 | PTSG-3.1940772D-08 | AZSG-8.6429135D 01 |
| LTS-1.0539955D-01 | LNS 8.3719072D 01 | LTE-6.8428924D 00 |
| LNE-6.4557218D 00 | DSMP 2.1575103D-01 | KSMP 9.0160991D 01 |
| LIN 1.7587458D 02 | LAN-1.5511152D 02 | LAP 2.9897251D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.17089703D 05

| | | |
|-------------------|--------------------|-------------------|
| X-1.0972332D 08 | Y 3.3494489D 08 | Z 1.8505603D 08 |
| DX 1.4663927D 03 | DY 3.3489460D 02 | DZ 3.1856695D 02 |
| R 3.9808670D 08 | DEC 2.7701395D 01 | RA 1.0813807D 02 |
| V 1.5375132D 03 | PTH 9.5735607D-01 | AZ-7.6980778D 01 |
| ALT 3.9171315D 08 | LTGD 2.7703926D 01 | LON 2.3156231D 02 |
| VE 2.7201708D 04 | PTE 5.4142034D-02 | AZE-8.9270515D 01 |

FREE-RETURN VACUUM PERIGEE
TIME 9 APRIL 1968 1 HRS., 39 MIN., 44.937 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.12597342D 05

| | | |
|-------------------|--------------------|-------------------|
| X 9.2964048D 05 | Y-6.0833025D 06 | Z-2.6217328D 06 |
| DX 8.1917893D 03 | DY 3.8509998D 03 | DZ-5.9924156D 03 |
| R 6.6891168D 06 | DEC-2.3075268D 01 | RA-8.1311367D 01 |
| V 1.0855628D 04 | PTH-7.9586646D-02 | AZ 1.2691354D 02 |
| ALT 3.1425052D 05 | LTGD-2.3207778D 01 | LON 5.6384741D 01 |
| VE 1.0500292D 04 | PTE-1.9609697D-12 | AZE 1.2838446D 02 |

TABLE 10-XCV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 7 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 23 HRS., 46 MIN., 12.290 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 7.764000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -5.506605E 06 | YYY | -3.571465E 04 | ZZZ | 3.576831E 06 |
| DXX | -4.248381E 03 | DYY | 7.075230E 01 | DZZ | -6.535920E 03 |
| R | 6.566406E 06 | WT | 2.977214E 05 | F | 1.980994E 01 |
| V | 7.795639E 03 | PTH | 1.538750E-02 | AZ | 9.279713E 01 |
| ALT | 1.946081E 05 | LAT | -3.300931E 01 | LON | 2.865716E 01 |
| VF | 7.394605E 03 | PTF | 1.622245E-02 | AZF | 9.294896E 01 |
| ANG | 3.873822E 00 | NFA | 9.197192E 01 | IAC | 9.246151E 00 |
| CPA | 1.191540E 02 | VPA | 1.191540E 02 | CYA | 5.398752E-01 |
| VYA | 5.398752E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.224000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -6.565282E 06 | YYY | -8.899565E 02 | ZZZ | 1.974535E 05 |
| DXX | -2.399466E 02 | DYY | 7.705479E 01 | DZZ | -7.797008E 03 |
| R | 6.568250E 06 | WT | 2.965854E 05 | F | 2.073030E 05 |
| V | 7.801080E 03 | PTH | 3.992135E-02 | AZ | 7.347282E 01 |
| ALT | 1.951675E 05 | LAT | -2.912042E 01 | LON | 6.315716E 01 |
| VF | 7.400901E 03 | PTF | 4.207996E-02 | AZF | 7.255130E 01 |
| ANG | 3.980156E 00 | NFA | 7.663242E 01 | IAC | 1.187784E 01 |
| CPA | 8.789249E 01 | VPA | 8.789249E 01 | CYA | 5.652067E-01 |
| VYA | 5.652067E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.559961E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -6.077662E 06 | YYY | 4.403682E 04 | ZZZ | -2.814604E 06 |
| DXX | 3.302308E 03 | DYY | 3.089736E 02 | DZZ | -1.032410E 04 |
| R | 6.697903E 06 | WT | 1.393906E 05 | F | 2.060472E 05 |
| V | 1.084379E 04 | PTH | 7.119311E 00 | AZ | 6.335383E 01 |
| ALT | 3.220195E 05 | LAT | -1.902426E 01 | LON | 8.877564E 01 |
| VF | 1.043645E 04 | PTF | 7.398708E 00 | AZF | 6.220734E 01 |
| ANG | 7.950165E 00 | NFA | 1.394527E 01 | IAC | 1.626913E 01 |
| CPA | 7.063711E 01 | VPA | 7.063647E 01 | CYA | 8.215526E 00 |
| VYA | 8.215640E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

TABLE 10- XCV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 3 APRIL 1968 2 HRS., 8 MIN., 52.251 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 8.55996080 03

| | | |
|-------------------|--------------------|-------------------|
| X 4.2750309D 06 | Y-4.6710213D 06 | Z-2.1834785D 06 |
| DX 9.0144501D 03 | DY 4.3952707D 03 | DZ 4.1242003D 03 |
| R 6.6979032D 06 | DEC-1.9025827D 01 | RA-4.7534498D 01 |
| V 1.0843788D 04 | PTH 7.1193115D 00 | AZ 6.3352476D 01 |
| ALT 3.2202101D 05 | LTGD-1.9138983D 01 | LON 8.8774953D 01 |
| VE 1.0436457D 04 | PTE 7.3459249D 00 | AZE 6.2192989D 01 |

PERISELENUM
TIME 6 APRIL 1968 3 HRS., 33 MIN., 49.840 SEC.,GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-5.5993988D 05 | YSC 1.6527099D 06 | ZSC 7.3104489D 05 |
| DXSC 2.4043380D 03 | DYSC 6.4347845D 02 | DZSC 3.8684563D 02 |
| RSC 1.8919327D 06 | DESC 2.2730749D 01 | RASC 1.0871643D 02 |
| VSC 2.5188401D 03 | PTSC 3.6955707D-13 | AZSC-8.0414807D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8814545D 06 | YSG 1.8805942D 05 | ZSG 6.4590365D 04 |
| DXSG 2.5410229D 02 | DYSG 2.5092093D 03 | DZSG 9.6011824D 01 |
| HSG 1.5384321D 05 | LTSG 1.9564514D 00 | LNSG 1.7429199D 02 |
| VRSG 2.5238696D 03 | PTSG-4.1220600D-08 | AZSG-8.7818579D 01 |
| LTS-1.0470054D-01 | LNS 8.3335081D 01 | LTE-6.8449060D 00 |
| LNE-6.4799062D 00 | DSMP 2.1289072D-01 | RSMP 8.9803827D 01 |
| LIN 1.7706687D 02 | LAN-1.4389542D 02 | LAP 4.1849898D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7285755D 05

| | | |
|-------------------|--------------------|-------------------|
| X-1.1224684D 08 | Y 3.3413178D 08 | Z 1.8469685D 08 |
| DX 1.4737581D 03 | DY 3.4069415D 02 | DZ 2.5407673D 02 |
| R 3.9794011D 08 | DEC 2.7654078D 01 | RA 1.0856904D 02 |
| V 1.5338157D 03 | PTH-4.3751607D-01 | AZ-7.8987669D 01 |
| ALT 3.9156654D 08 | LTGD 2.7656607D 01 | LON 2.2062351D 02 |
| VE 2.7210485D 04 | PTE-2.4634679D-02 | AZE-8.9383066D 01 |

FREE-RETURN VACUUM PERIGEE
TIME 9 APRIL 1968 1 HRS., 55 MIN., 27.395 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.2615511D 05

| | | |
|-------------------|--------------------|-------------------|
| X 8.9936653D 05 | Y-6.2173291D 06 | Z-2.7802339D 06 |
| DX 8.9157384D 03 | DY 3.4599432D 03 | DZ-4.8230751D 03 |
| R 6.8697702D 06 | DEC-2.3872673D 01 | RA-8.1768980D 01 |
| V 1.0710913D 04 | PTH-6.5262252D-02 | AZ 1.1953322D 02 |
| ALT 4.9512150D 05 | LTGD-2.4005070D 01 | LUN 5.1989468D 01 |
| VE 1.0314811D 04 | PTE 3.8326063D-12 | AZE 1.2078768D 02 |

TABLE 10-XCVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 19 HRS..25 MIN..16.550 SEC. G. M. T.

RESTART SEQUENCE INITIATION

GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -6.067542E 06 | YYY -8.153241E 04 | ZZZ -2.549142E 06 | 04 |
| DXX 3.011371E 03 | DYY -1.679200E 02 | DZZ -7.175012E 03 | 06 |
| R 6.581781E 06 | WT 2.963076E C5 | F 1.484347E 01 | 03 |
| V 7.783145E 03 | PTH 3.600676E-02 | AZ 9.315657E 01 | 01 |
| ALT 2.097832E C5 | LAT -3.242116E 01 | LON 6.748179E 01 | 01 |
| VE 7.378653E 03 | PTE 3.798066E-02 | AZE 9.332981E 01 | 01 |
| ANG 3.875856E 00 | NFA 9.177267E 01 | IAC 9.203379E 00 | 00 |
| CPA 6.336155E 01 | VPA 6.336155E C1 | CYA -1.185562E 00 | 00 |
| VYA -1.185562E 00 | CRA -0.000000E-39 | VRA -0.000000E-39 | 00 |

S-IVB STAGE AT OPERATING THRUST LEVEL

GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -3.873985E 06 | YYY -1.445619E 05 | ZZZ -5.321666E 06 | 04 |
| DXX 6.294796E 03 | DYY -9.932049E 01 | DZZ -4.584818E 03 | 06 |
| R 6.583980E 06 | WT 2.951764E 05 | F 2.073030E 05 | 03 |
| V 7.788124E 03 | PTH 3.048868E-02 | AZ 7.421729E 01 | 05 |
| ALT 2.108146E 05 | LAT -2.886061E 01 | LON 1.017093E 02 | 01 |
| VE 7.384382E 03 | PTE 3.215579E-02 | AZE 7.332988E 01 | 02 |
| ANG 3.971937E 00 | NFA 7.577570E 01 | IAC 1.186338E 01 | 01 |
| CPA 3.219843E 01 | VPA 3.219843E 01 | CYA -6.441492E-01 | 01 |
| VYA -6.441492E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 01 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -1.271914E 06 | YYY -1.693154E 05 | ZZZ -6.571127E 06 | 04 |
| DXX 1.034401E 04 | DYY -5.547109E 01 | DZZ -3.261622E 03 | 06 |
| R 6.695233E 06 | WT 1.388679E C5 | F 2.060472E 05 | 03 |
| V 1.084615E 04 | PTH 6.551363E 00 | AZ 6.348678E 01 | 05 |
| ALT 3.194930E 05 | LAT -1.964001E 01 | LON 1.260662E 02 | 01 |
| VE 1.043954E 04 | PTE 6.807742E C0 | AZE 6.235213E 01 | 02 |
| ANG 2.358490E 00 | NFA 6.119934E 01 | IAC 1.642468E 01 | 01 |
| CPA 1.566244E 01 | VPA 1.566324E C1 | CYA -2.900064E-01 | 01 |
| VYA -2.899401E-01 | CRA -0.000000E-39 | VRA 0.000000E-39 | 01 |

TABLE 10- XCVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 2 APRIL 1968 23 HRS., 29 MIN., 52.485 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.4675935D 04

| | | |
|-------------------|--------------------|-------------------|
| X 4.0446106D 06 | Y-4.8376100D 06 | Z-2.2505101D 06 |
| DX 9.1819369D 03 | DY 4.0500062D 03 | DZ 4.1145209D 03 |
| R 6.6952327D 06 | DEC-1.9641643D 01 | RA-5.0101804D 01 |
| V 1.0846188D 04 | PTH 6.5513611D 00 | AZ 6.3485495D 01 |
| ALT 3.1949461D 05 | LTGD-1.9757920D 01 | LON 1.2606549D 02 |
| VE 1.0439546D 04 | PTE 6.7537652D 00 | AZE 6.2338567D 01 |

PERISELENUM

TIME 6 APRIL 1968 0 HRS., 56 MIN., 47.863 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-5.2353980D 05 | YSC 1.6662220D 06 | ZSC 7.4248787D 05 |
| DXSC 2.4171895D 03 | DYSC 6.0447664D 02 | DZSC 3.4788800D 02 |
| RSC 1.8978087D 06 | DESC 2.3031322D 01 | RASC 1.0744312D 02 |
| VSC 2.5157947D 03 | PTSC-2.8059617D-12 | AZSC-8.1358089D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8878769D 06 | YSG 1.8089335D 05 | ZSG 6.9829344D 04 |
| DXSG 2.4306319D 02 | DYSG 2.5079923D 03 | DZSG 7.4384833D 01 |
| HSG 1.5971920D 05 | LTSG 2.1086582D 00 | LNSG 1.7452671D 02 |
| VRSG 2.5208408D 03 | PTSG-1.7178752D-08 | AZSG-8.8307923D 01 |
| LTS-1.0711296D-01 | LNS 8.4664602D 01 | LTE-6.8366009D 00 |
| LNE-6.3949471D 00 | DSMP 2.2279363D-01 | RSMP 9.1039268D 01 |
| LIN 1.7729452D 02 | LAN-1.3428794D 02 | LAP 5.1216535D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7909131D 05

| | | |
|-------------------|--------------------|-------------------|
| X-1.0341102D 08 | Y 3.3690154D 08 | Z 1.8590583D 08 |
| DX 1.4800125D 03 | DY 3.2220879D 02 | DZ 2.2646131D 02 |
| R 3.9844380D 08 | DEC 2.7812511D 01 | RA 1.0706372D 02 |
| V 1.5315156D 03 | PTH-2.2501357D-01 | AZ-8.0255591D 01 |
| ALT 3.9207029D 08 | LTGD 2.7815046D 01 | LON 2.5848391D 02 |
| VE 2.7209167D 04 | PTE-1.2641096D-02 | AZE-8.9454150D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 8 APRIL 1968 23 HRS., 26 MIN., 31.872 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.3287532D 05

| | | |
|-------------------|--------------------|-------------------|
| X 7.0946423D 05 | Y-5.7495891D 06 | Z-2.6096197D 06 |
| DX 9.4035572D 03 | DY 3.4048665D 03 | DZ-4.9119938D 03 |
| R 6.3538358D 06 | DEC-2.4249796D 01 | RA-8.2965604D 01 |
| V 1.1142158D 04 | PTH-7.0135527D-02 | AZ 1.1895107D 02 |
| ALT-2.0706201D 04 | LTGD-2.4394686D 01 | LON 8.8126123D 01 |
| VE 1.0774444D 04 | PTE 5.0027964D-12 | AZE 1.2003865D 02 |

TABLE 10- XCVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - SECOND OPPORTUNITY (CONTINUED)

TRANSLUNAR INJECTION
 TIME 2 APRIL 1968 23 HRS., 29 MIN., 52.485 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4675935D 04

| | | |
|-------------------|--------------------|-------------------|
| X 4.0446106D 06 | Y-4.8376100D 06 | Z-2.2505101D 06 |
| DX 9.1819369D 03 | DY 4.0500062D 03 | DZ 4.1145209D 03 |
| R 6.6952327D 06 | DEC-1.9641643D 01 | RA-5.0101804D 01 |
| V 1.0846188D 04 | PTH 6.5513611D 00 | AZ 6.3485495D 01 |
| ALT 3.1949461D 05 | LTGD-1.9757920D 01 | LON 1.2606549D 02 |
| VE 1.0439546D 04 | PTE 6.7537652D 00 | AZE 6.2338567D 01 |

PERISELENUM
 TIME 6 APRIL 1968 0 HRS., 56 MIN., 47.863 SEC.,GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-5.2353980D 05 | YSC 1.6662220D 06 | ZSC 7.4248787D 05 |
| DXSC 2.4171895D 03 | DYSC 6.0447664D 02 | DZSC 3.4788800D 02 |
| RSC 1.8978087D 06 | DESC 2.3031322D 01 | RASC 1.0744312D 02 |
| VSC 2.5157947D 03 | PTSC-2.8059617D-12 | AZSC-8.1358089D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8878769D 06 | YSG 1.8089335D 05 | ZSG 6.9829344D 04 |
| DXSG 2.4306319D 02 | DYSG 2.5079923D 03 | DZSG 7.4384833D 01 |
| HSG 1.5971920D 05 | LTSG 2.1086582D 00 | LNSG 1.7452671D 02 |
| VRSG 2.5208408D 03 | PTSG-1.7178752D-08 | AZSG-8.8307923D 01 |
| LTS-1.0711296D-01 | LNS 8.4664602D 01 | LTE-6.8366009D 00 |
| LNE-6.3949471D 00 | DSMP 2.2279363D-01 | RSMP 9.1039268D 01 |
| LIN 1.7729452D 02 | LAN-1.3428794D 02 | LAP 5.1216535D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7909131D 05

| | | |
|-------------------|--------------------|-------------------|
| X-1.0341102D 08 | Y 3.3690154D 08 | Z 1.8590583D 08 |
| DX 1.4800125D 03 | DY 3.2220879D 02 | DZ 2.2646131D 02 |
| R 3.9844380D 08 | DEC 2.7812511D 01 | RA 1.0706372D 02 |
| V 1.5315156D 03 | PTH-2.2501357D-01 | AZ-8.0255591D 01 |
| ALT 3.9207029D 08 | LTGD 2.7815046D 01 | LON 2.5848391D 02 |
| VE 2.7209167D 04 | PTE-1.2641096D-02 | AZE-8.9454150D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 8 APRIL 1968 23 HRS., 26 MIN., 31.872 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3287532D 05

| | | |
|-------------------|--------------------|-------------------|
| X 7.0946423D 05 | Y-5.7495891D 06 | Z-2.6096197D 06 |
| DX 9.4035572D 03 | DY 3.4048665D 03 | DZ-4.9119938D 03 |
| R 6.3538358D 06 | DEC-2.4249796D 01 | RA-8.2965604D 01 |
| V 1.1142158D 04 | PTH-7.0135527D-02 | AZ 1.1895107D 02 |
| ALT-2.0706201D 04 | LTGD-2.4394686D 01 | LON 8.8126123D 01 |
| VE 1.0774444D 04 | PTE 5.0027964D-12 | AZE 1.2003865D 02 |

TABLE 10-XCVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 81 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 21 HRS..18 MIN..40.140 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.354300E 04 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -6.576433E 06 | YYY | -1.702875E 04 | ZZZ | 1.120408E 05 |
| DXX | -1.370981E 02 | DYY | -1.330540E 02 | DZZ | -7.785881E 03 |
| R | 6.577409E 06 | WT | 2.976602E 05 | F | 1.666599E 01 |
| V | 7.788224E 03 | PTH | 3.528385E-02 | AZ | 9.853165E 01 |
| ALT | 2.040694E 05 | LAT | -2.830503E 01 | LON | 4.174362E 01 |
| VE | 7.370878E 03 | PTE | 3.728137E-02 | AZE | 9.901864E 01 |
| ANG | 3.902485E 00 | NFA | 9.696065E 01 | IAC | 9.218274E 00 |
| CPA | 8.713825E 01 | VPA | 8.713825E 01 | CYA | -9.666844E-01 |
| VYA | -9.666844E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.400300E 04 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -5.685471E 06 | YYY | -7.402395E 04 | ZZZ | -3.311399E 06 |
| DXX | 3.917506E 03 | DYY | -1.086907E 02 | DZZ | -6.734918E 03 |
| R | 6.579926E 06 | WT | 2.965272E 05 | F | 2.073030E 05 |
| V | 7.792162E 03 | PTH | 4.154797E-02 | AZ | 8.122102E 01 |
| ALT | 2.065644E 05 | LAT | -2.823518E 01 | LON | 7.537533E 01 |
| VE | 7.374673E 03 | PTE | 4.390009E-02 | AZE | 8.071976E 01 |
| ANG | 3.904630E 00 | NFA | 8.192203E 01 | IAC | 1.185125E 01 |
| CPA | 5.594459E 01 | VPA | 5.594459E 01 | CYA | -7.539376E-01 |
| VYA | -7.539376E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.432108E 04 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -3.791336E 06 | YYY | -1.078966E 05 | ZZZ | -5.515636E 06 |
| DXX | 8.173414E 03 | DYY | -1.037701E 02 | DZZ | -7.131744E 03 |
| R | 6.693886E 06 | WT | 1.394913E 05 | F | 2.060472E 05 |
| V | 1.084791E 04 | PTH | 6.610339E 00 | AZ | 6.961428E 01 |
| ALT | 3.186658E 05 | LAT | -2.173929E 01 | LON | 1.010670E 02 |
| VE | 1.042704E 04 | PTE | 6.878422E 00 | AZE | 6.874008E 01 |
| ANG | 2.596866E 00 | NFA | 7.036236E 01 | IAC | 1.641098E 01 |
| CPA | 3.891652E 01 | VPA | 3.891577E 01 | CYA | -5.480117E-01 |
| VYA | -5.480023E-01 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

D5-15481-1

TABLE 10- XCVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 3 APRIL 1968

1 HRS., 17 MIN., 21.219 SEC., GMT

GEOCENTRIC REFERENCE

FLIGHT TIME 1.4321079D 04

| | | |
|-------------------|--------------------|-------------------|
| X 4.1477482D 06 | Y-4.6321136D 06 | Z-2.4794791D 06 |
| DX 9.2262717D 03 | DY 4.8380608D 03 | DZ 3.0242883D 03 |
| R 6.6938858D 06 | DEC-2.1740875D 01 | RA-4.8157677D 01 |
| V 1.0847914D 04 | PTH 6.6103408D 00 | AZ 6.9612919D 01 |
| ALT 3.1866739D 05 | LTGD-2.1867243D 01 | LON 1.0106633D 02 |
| VE 1.0427047D 04 | PTE 6.8325795D 00 | AZE 6.8724522D 01 |

PERISELENUM

TIME 6 APRIL 1968

2 HRS., 7 MIN., 19.851 SEC., GMT

SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-5.6430098D 05 | YSC 1.6526423D 06 | ZSC 7.3814692D 05 |
| DXSC 2.4018064D 03 | DYSC 6.2453042D 02 | DZSC 4.3787532D 02 |
| RSC 1.8959227D 06 | DESC 2.2913055D 01 | RASC 1.0885266D 02 |
| VSC 2.5200093D 03 | PTSC 1.4161326D-12 | AZSC-7.9126333D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8878961D 06 | YSG 1.5904386D 05 | ZSG 7.1249860D 04 |
| DXSG 2.1723000D 02 | DYSG 2.5111787D 03 | DZSG 1.5045771D 02 |
| HSG 1.5783324D 05 | LTSG 2.1537152D 00 | LNSG 1.7518454D 02 |
| VRSG 2.5250435D 03 | PTSG-2.5706483D-08 | AZSG-8.6581517D 01 |
| LTS-1.0603209D-01 | LNS 8.4067424D 01 | LTE-6.8407948D 00 |
| LNE-6.4335327D 00 | DSMP 2.1834577D-01 | RSMP 9.0484763D 01 |
| LIN 1.7595458D 02 | LAN-1.5269167D 02 | LAP 3.2188173D 01 |

GEOCENTRIC REFERENCE

FLIGHT TIME 2.7651971D 05

| | | |
|-------------------|--------------------|-------------------|
| X-1.0741182D 08 | Y 3.3567388D 08 | Z 1.8537682D 08 |
| DX 1.4675237D 03 | DY 3.3303624D 02 | DZ 3.1135044D 02 |
| R 3.9821956D 08 | DEC 2.7743498D 01 | RA 1.0774407D 02 |
| V 1.5367102D 03 | PTH 1.1123136D 00 | AZ-7.7363999D 01 |
| ALT 3.9184602D 08 | LTGD 2.7746031D 01 | LON 2.4148270D 02 |
| VE 2.7201662D 04 | PTE 6.2865567D-02 | AZE-8.9292037D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 9 APRIL 1968

1 HRS., 0 MIN., 55.797 SEC., GMT

GEOCENTRIC REFERENCE

FLIGHT TIME 5.3173566D 05

| | | |
|-------------------|--------------------|-------------------|
| X 8.6618115D 05 | Y-5.8194188D 06 | Z-2.5257187D 06 |
| DX 8.3971187D 03 | DY 3.9186387D 03 | DZ-6.1080722D 03 |
| R 6.4027463D 06 | DEC-2.3233189D 01 | RA-8.1534060D 01 |
| V 1.1098463D 04 | PTH-8.3452347D-02 | AZ 1.2683747D 02 |
| ALT 2.7923495D 04 | LTGD-2.3372381D 01 | LON 6.5893370D 01 |
| VE 1.0758166D 04 | PTE 3.4130402D-12 | AZE 1.2820762D 02 |

TABLE 10-XCVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 22 HRS..55 MIN..04.680 SEC. G. M. T.

RESTART SEQUENCE INITIATION
GEOCENTRIC REFERENCE

| | | | | | | | |
|-----|---------------|-----|---------------|-------------|---------------|-----|---------------|
| XXX | -6.117758E 06 | YYY | 5.791934E 03 | FLIGHT TIME | 1.323700E 04 | ZZZ | 2.406501E 06 |
| DXX | -2.855348E 03 | DYY | -7.337014E 01 | DZZ | -7.249343E 03 | F | 1.823410E 01 |
| R | 6.574059E 06 | WT | 2.981897E 05 | AZ | 1.007562E 02 | LON | 1.994410E 01 |
| V | 7.791750E 03 | PTH | 2.500215E-02 | AZE | 1.013785E 02 | IAC | 9.228766E 00 |
| ALT | 2.001700E 05 | LAT | -2.651037E 01 | CYA | -5.417202E-01 | VRA | -0.000000E-39 |
| VE | 7.370740E 03 | PTE | 2.643026E-02 | | | | |
| ANG | 3.521064E 00 | NFA | 9.915390E 01 | | | | |
| CPA | 1.076282E 02 | VPA | 1.076282E 02 | | | | |
| VYA | -5.417202E-01 | CRA | -0.000000E-39 | | | | |

S-IVB STAGE AT OPERATING THRUST LEVEL
GEOCENTRIC REFERENCE

| | | | | | | | |
|-----|---------------|-----|---------------|-------------|---------------|-----|---------------|
| XXX | -6.481105E 06 | YYY | -2.834444E 04 | FLIGHT TIME | 1.369700E 04 | ZZZ | -1.114182E 06 |
| DXX | 1.215508E 03 | DYY | -7.145917E 01 | DZZ | -7.683701E 03 | F | 2.073030E 05 |
| R | 6.576239E 06 | WT | 2.970553E 05 | AZ | 8.420752E 01 | LON | 5.322250E 01 |
| V | 7.795827E 03 | PTH | 4.148698E-02 | AZE | 8.387523E 01 | IAC | 1.185182E 01 |
| ALT | 2.027770E 05 | LAT | -2.791169E 01 | CYA | -5.073593E-01 | VRA | -0.000000E-39 |
| VE | 7.374354E 03 | PTE | 4.385801E-C2 | | | | |
| ANG | 3.886578E 00 | NFA | 8.481012E 01 | | | | |
| CPA | 7.641460E 01 | VPA | 7.641460E 01 | | | | |
| VYA | -5.073593E-01 | CRA | -0.000000E-39 | | | | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)
GEOCENTRIC REFERENCE

| | | | | | | | |
|-----|---------------|-----|---------------|-------------|---------------|-----|---------------|
| XXX | -5.471820E 06 | YYY | -5.229966E 04 | FLIGHT TIME | 1.401642E 04 | ZZZ | -3.852970E 06 |
| DXX | 5.171484E 03 | DYY | -7.839627E 01 | DZZ | -9.537337E 03 | F | 2.060472E 05 |
| R | 6.692453E 06 | WT | 1.397452E 05 | AZ | 7.225914E 01 | LON | 7.942097E 01 |
| V | 1.084948E 04 | PTH | 6.685964E 00 | AZE | 7.149906E 01 | IAC | 1.635926E 01 |
| ALT | 3.174636E 05 | LAT | -2.262067E 01 | CYA | -4.164938E-01 | VRA | 0.000000E-39 |
| VE | 1.042436E 04 | PTE | 6.959946E 00 | | | | |
| ANG | 2.428811E 00 | NFA | 7.190200E 01 | | | | |
| CPA | 5.549160E 01 | VPA | 5.949214E 01 | | | | |
| VYA | -4.164524E-01 | CRA | -0.000000E-39 | | | | |

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TABLE 10- XCVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 3 APRIL 1968 2 HRS., 48 MIN., 41.101 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.4016421D 04
X 4.2203013D 06 Y-4.5112190D 06 Z-2.5742739D 06
DX 9.1542697D 03 DY 5.2376011D 03 DZ 2.5452060D 03
R 6.6924530D 06 DEC-2.2622216D 01 RA-4.6908279D 01
V 1.0849479D 04 PTH 6.6859640D 00 AZ 7.2257734D 01
ALT 3.1746524D 05 LTGD-2.2752637D 01 LON 7.9420380D 01
VE 1.0424373D 04 PTE 6.9185351D 00 AZE 7.1482548D 01

PERISELENUM

TIME 6 APRIL 1968 3 HRS., 16 MIN., 7.648 SEC.,GMT
SELENOCENTRIC REFERENCE
XSC-5.9591220D 05 YSC 1.6433018D 06 ZSC 7.3291758D 05
DXSC 2.3886730D 03 DYSC 6.4819714D 02 DZSC 4.8880870D 02
RSC 1.8959473D 06 DECS 2.2747617D 01 RASC 1.0993221D 02
VSC 2.5228366D 03 PTSC-9.6016666D-13 AZSC-7.7872196D 01
SELENOGRAPHIC REFERENCE
XSG-1.8884731D 05 YSG 1.4650851D 05 ZSG 7.0177239D 04
DXSG 2.0195915D 02 DYSG 2.5127204D 03 DZSG 1.8894299D 02
HSG 1.5735780D 05 TSG 2.1218098D 00 LNSG 1.7556385D 02
VRSG 2.5278946D 03 TSSG-3.5525252D-08 AZSG-8.5710580D 01
LTS-1.0497360D-01 LNS 8.3484962D 01 LTE-6.8441573D 00
LNF-6.4705009D 00 DSMP 2.1400718D-01 RSMP 8.9943270D 01
LIN 1.7520773D 02 LAN-1.5820926D 02 LAP 2.6306504D 01
GEOCENTRIC REFERENCE FLIGHT TIME 2.7486297D 05
X-1.1129395D 08 Y 3.3444277D 08 Z 1.8483907D 08
DX 1.4573224D 03 DY 3.4772120D 02 DZ 3.5731693D 02
R 3.9799973D 08 DEC 2.7672696D 01 RA 1.0840611D 02
V 1.5402512D 03 PTH 1.8834514D 00 AZ-7.5827255D 01
ALT 3.9162618D 08 LTGD 2.7675226D 01 LON 2.2489850D 02
VE 2.7198071D 04 PTE 1.0667746D-01 AZE-8.9205947D 01

FREE-RETURN VACUUM PERIGEE

TIME 9 APRIL 1968 2 HRS., 22 MIN., 10.129 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.3082545D 05
X 9.8956538D 05 Y-5.8312745D 06 Z-2.4718386D 06
DX 7.7427938D 03 DY 4.1922434D 03 DZ-6.7449380D 03
R 6.4103813D 06 DEC-2.2680950D 01 RA-8.0368675D 01
V 1.1091436D 04 PTH-9.0031516D-02 AZ 1.3128070D 02
ALT 3.5409972D 04 LTGD-2.2817413D 01 LON 4.6693432D 01
VE 1.0771078D 04 PTE 4.8382095D-12 AZE 1.3279461D 02

TABLE 10-XCIX TRANSUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 99 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 23 HRS..33 MIN..31.520 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.719778E 06 | YYY | -9.449821E 03 |
| DXX | -3.840527E 03 | DYY | -1.664494E 01 |
| R | 6.572262E 06 | WT | 2.978539E 05 |
| V | 7.792916E 03 | PTH | 1.907769E-02 |
| ALT | 1.991054E 05 | LAT | -2.888868E 01 |
| VE | 7.377103E 03 | PTE | 2.015286E-02 |
| ANG | 3.894436E 00 | NFA | 9.619524E 01 |
| CPA | 1.156564E 02 | VPA | 1.156564E 02 |
| VYA | -1.165420E-01 | CRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.571212E 06 | YYY | -1.660893E 04 |
| DXX | 2.306940E 02 | DYY | -1.369716E 01 |
| R | 6.574251E 06 | WT | 2.967190E 05 |
| V | 7.797588E 03 | PTH | 4.119595E-02 |
| ALT | 2.008726E 05 | LAT | -2.818029E 01 |
| VE | 7.381818E 03 | PTE | 4.351625E-02 |
| ANG | 3.914066E 00 | NFA | 8.146200E 01 |
| CPA | 8.443465E 01 | VPA | 8.443465E 01 |
| VYA | -9.065095E-02 | CRA | -0.000000E-39 |

TRANSUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.553617E 06 | YYY | -2.023676E 04 |
| DXX | 3.792496E 03 | DYY | -8.289110E 00 |
| R | 6.690438E 06 | WT | 1.396214E 05 |
| V | 1.085055E 04 | PTH | 6.684699E 00 |
| ALT | 3.150680E 05 | LAT | -2.115007E 01 |
| VE | 1.043136E 04 | PTE | 6.954623E 00 |
| ANG | 2.531621E 00 | NFA | 6.899524E 01 |
| CPA | 6.744697E 01 | VPA | 6.744646E 01 |
| VYA | -5.128420E-02 | CRA | -0.000000E-39 |

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TABLE 10- XCIX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH OF 99 DEGREES - SECOND OPPORTUNITY (CONTINUED)

TRANSLUNAR INJECTION
 TIME 3 APRIL 1968 3 HRS., 25 MIN., 7.953 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.3896433D 04

| | | |
|-------------------|--------------------|-------------------|
| X 4.2554702D 06 | Y-4.5634166D 06 | Z-2.4141594D 06 |
| DX 9.1089386D 03 | DY 4.9393037D 03 | DZ 3.2194508D 03 |
| R 6.6904382D 06 | DEC-2.1151623D 01 | RA-4.6999894D 01 |
| V 1.0850546D 04 | PTH 6.6846998D 00 | AZ 6.8551430D 01 |
| ALT 3.1506959D 05 | LTGD-2.1275296D 01 | LON 7.0191935D 01 |
| VE 1.0431374D 04 | PTE 6.9075369D 00 | AZE 6.7616849D 01 |

PERISELENUM
 TIME 6 APRIL 1968 4 HRS., 15 MIN., 25.508 SEC.,GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-5.9542373D 05 | YSC 1.6423629D 06 | ZSC 7.3384438D 05 |
| DXSC 2.3889918D 03 | DYSC 6.6396770D 02 | DZSC 4.5239355D 02 |
| RSC 1.8948385D 06 | DESC 2.2785729D 01 | RASC 1.0992765D 02 |
| VSC 2.5204751D 03 | PTSC 8.6731735D-13 | AZSC-7.8773945D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8863225D 06 | YSG 1.6463775D 05 | ZSG 7.1377646D 04 |
| DXSG 2.2481170D 02 | DYSG 2.5110484D 03 | DZSG 1.4926232D 02 |
| HSG 1.5674900D 05 | LTSG 2.1588148D 00 | LNSG 1.7501187D 02 |
| VRSG 2.5255066D 03 | PTSG-4.6414287D-08 | AZSG-8.6609320D 01 |
| LTS-1.0405786D-01 | LNS 8.2982933D 01 | LTE-6.8464766D 00 |
| LNE-6.5018301D 00 | DSMP 2.1026749D-01 | RSMP 8.9476029D 01 |
| LIN 1.7597540D 02 | LAN-1.5259145D 02 | LAP 3.2460692D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7611399D 05

| | | |
|-------------------|--------------------|-------------------|
| X-1.1460245D 08 | Y 3.3335903D 08 | Z 1.8436456D 08 |
| DX 1.4602526D 03 | DY 3.5576463D 02 | DZ 3.1662566D 02 |
| R 3.9780932D 08 | DEC 2.7609926D 01 | RA 1.0897198D 02 |
| V 1.5359550D 03 | PTH 9.0243241D-01 | AZ-7.7030943D 01 |
| ALT 3.9143574D 08 | LTGD 2.7612453D 01 | LON 2.1059937D 02 |
| VE 2.7204080D 04 | PTE 5.0981671D-02 | AZE-8.9274066D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 9 APRIL 1968 2 HRS., 57 MIN., 6.766 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3061525D 05

| | | |
|-------------------|--------------------|-------------------|
| X 9.7693875D 05 | Y-5.8263999D 06 | Z-2.5414898D 06 |
| DX 8.4923253D 03 | DY 4.0026288D 03 | DZ-5.8724417D 03 |
| R 6.4312141D 06 | DEC-2.3277225D 01 | RA-8.0481498D 01 |
| V 1.1073671D 04 | PTH-8.0197836D-02 | AZ 1.2530292D 02 |
| ALT 5.6403245D 04 | LTGD-2.3415999D 01 | LON 3.7820707D 01 |
| VE 1.0724983D 04 | PTE 3.8873389D-12 | AZE 1.2663312D 02 |

TABLE 10-C TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 23 HRS., 46 MIN., 12.290 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.573699E 06 | YYY | -3.311989E 04 | ZZZ 3.480668E 06 |
| DXX | -4.130043E 03 | DYY | 3.702579E 01 | DZZ -6.608323E 03 |
| R | 6.571321E 06 | WT | 2.966803E 05 | F 1.874605E 01 |
| V | 7.792853E 03 | PTH | 1.902736E-02 | AZ 9.188029E 01 |
| ALT | 1.595430E 05 | LAT | -3.306679E 01 | LON 7.659667E 00 |
| VE | 7.391504E 03 | PTE | 2.006111E-02 | AZE 9.198243E 01 |
| ANG | 3.872381E 00 | NFA | 9.124270E 01 | IAC 9.232280E 00 |
| CPA | 1.181344E 02 | VPA | 1.181344E 02 | CYA 2.911044E-01 |
| VYA | 2.911044E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.572858E 06 | YYY | -1.342942E 04 | ZZZ 8.435756E 04 |
| DXX | -1.061472E 02 | DYY | 4.661372E 01 | DZZ -7.797243E 03 |
| R | 6.573413E 06 | WT | 2.955453E 05 | F 2.073030E 05 |
| V | 7.798105E 03 | PTH | 4.393653E-02 | AZ 7.274564E 01 |
| ALT | 2.002035E 05 | LAT | -2.872173E 01 | LON 4.198187E 01 |
| VE | 7.397709E 03 | PTE | 4.631457E-02 | AZE 7.177989E 01 |
| ANG | 3.590824E 00 | NFA | 7.589099E 01 | IAC 1.188109E 01 |
| CPA | 8.690988E 01 | VPA | 8.690988E 01 | CYA 3.496288E-01 |
| VYA | 3.496288E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.081282E 06 | YYY | 4.837771E 03 | ZZZ -2.783804E 06 |
| DXX | 3.346275E 03 | DYY | 6.966134E 01 | DZZ -1.032265E 04 |
| R | 6.688167E 06 | WT | 1.391033E 05 | F 2.060472E 05 |
| V | 1.085170E 04 | PTH | 6.635775E 00 | AZ 6.225063E 01 |
| ALT | 3.122432E 05 | LAT | -1.884796E 01 | LON 6.623131E 01 |
| VE | 1.044828E 04 | PTE | 6.893211E 00 | AZE 6.106349E 01 |
| ANG | 2.630399E 00 | NFA | 6.357170E 01 | IAC 1.643701E 01 |
| CPA | 6.594273E 01 | VPA | 6.994225E 01 | CYA 3.599450E-01 |
| VYA | 3.599334E-01 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

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TABLE 10- C TRANSUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 2 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSUNAR INJECTION
TIME 3 APRIL 1968 3 HRS., 37 MIN., 11.744 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.3859454D 04
X 4.2404073D 06 Y-4.6990744D 06 Z-2.1608396D 06
DX 8.9634235D 03 DY 4.3058506D 03 DZ 4.3446677D 03
R 6.6881673D 06 DEC-1.8849532D 01 RA-4.7937155D 01
V 1.0851703D 04 PTH 6.6357749D 00 AZ 6.2249286D 01
ALT 3.1224463D 05 LTGD-1.8961963D 01 LON 6.6230623D 01
VE 1.0448290D 04 PTE 6.8387936D 00 AZE 6.1050256D 01

PERISELENUM
TIME 6 APRIL 1968 5 HRS., 0 MIN., 9.423 SEC.,GMT
SELENOCENTRIC REFERENCE
XSC-5.8566807D 05 YSC 1.6457377D 06 ZSC 7.3506525D 05
DXSC 2.3933146D 03 DYSC 6.8034508D 02 DZSC 3.8366450D 02
RSC 1.8951993D 06 DESC 2.2821185D 01 RASC 1.0958909D 02
VSC 2.5175430D 03 PTSC 2.1901792D-12 AZSC-8.0483056D 01
SELENOGRAPHIC REFERENCE
XSG-1.8844607D 06 YSG 1.8848232D 05 ZSG 7.1153422D 04
DXSG 2.5389627D 02 DYSG 2.5085171D 03 DZSG 7.9355256D 01
HSG 1.5710982D 05 LTSG 2.1516201D 00 LNSG 1.7428831D 02
VRSG 2.5225817D 03 PTSG-5.6310646D-08 AZSG-8.8196018D 01
LTS-1.0336496D-01 LNS 8.2604227D 01 LTE-6.8478704D 00
LNE-6.5251332D 00 DSMP 2.0744631D-01 RSMP 8.9123242D 01
LIN 1.7719017D 02 LAN-1.3576061D 02 LAP 4.9985012D 01
GEOCENTRIC REFERENCE FLIGHT TIME 2.7803713D 05
X-1.1708265D 08 Y 3.3252740D 08 Z 1.8399707D 08
DX 1.4665985D 03 DY 3.6632222D 02 DZ 2.4467411D 02
R 3.9766536D 08 DEC 2.7561032D 01 RA 1.0939712D 02
V 1.5313290D 03 PTH-4.5932085D-01 AZ-7.9372568D 01
ALT 3.9129177D 08 LTGD 2.7563557D 01 LON 1.9981091D 02
VE 2.7213935D 04 PTE-2.5819521D-02 AZE-8.9405420D 01

FREE-RETURN VACUUM PERIGEE
TIME 9 APRIL 1968 3 HRS., 10 MIN., 34.678 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.3066239D 05
X 9.2997664D 05 Y-5.7611265D 06 Z-2.6305701D 06
DX 9.4382743D 03 DY 3.6286615D 03 DZ-4.5796021D 03
R 6.4011979D 06 DEC-2.4264504D 01 RA-8.0830256D 01
V 1.1100494D 04 PTH-6.5183675D-02 AZ 1.1693950D 02
ALT 2.6659804D 04 LTGD-2.4408381D 01 LON 3.4096433D 01
VE 1.0722859D 04 PTE 2.2866872D-12 AZE 1.1796979D 02

TABLE 10-C1 TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 20 HRS..00 MIN..46.840 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.800000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.263634E 06 | YYY | -1.093114E 05 | ZZZ -3.942673E 06 |
| DXX | 4.664833E 03 | DYY | -1.086610E 02 | DZZ -6.232236E 03 |
| R | 6.577420E 06 | WT | 2.972965E 05 | F 1.612810E 01 |
| V | 7.785450E 03 | PTH | 3.308978E-02 | AZ 8.446407E 01 |
| ALT | 2.053256E 05 | LAT | -3.213542E 01 | LON 1.054174E 02 |
| VE | 7.381298E 03 | PTE | 3.490157E-02 | AZE 8.415993E 01 |
| ANG | 3.883724E 00 | NFA | 8.450141E 01 | IAC 9.215783E 00 |
| CPA | 4.931534E 01 | VPA | 4.931534E 01 | CYA -7.336340E-01 |
| VYA | -7.336340E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.260000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -2.460890E 06 | YYY | -1.422960E 05 | ZZZ -6.100106E 06 |
| DXX | 7.224616E 03 | DYY | -3.099091E 01 | DZZ -2.917299E 03 |
| R | 6.579325E 06 | WT | 2.961639E 05 | F 2.073030E 05 |
| V | 7.791448E 03 | PTH | 2.375858E-02 | AZ 6.768339E 01 |
| ALT | 2.048142E 05 | LAT | -2.436620E 01 | LON 1.379574E 02 |
| VE | 7.389009E 03 | PTE | 2.505258E-02 | AZE 6.639644E 01 |
| ANG | 4.079299E 00 | NFA | 7.034384E 01 | IAC 1.186272E 01 |
| CPA | 1.811974E 01 | VPA | 1.811974E 01 | CYA -1.437480E-01 |
| VYA | -1.437480E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.592210E 03 |
|----------------------|--------------|-------------|---------------|-------------------|
| XXX | 4.995285E 05 | YYY | -1.281794E 05 | ZZZ -6.684172E 06 |
| DXX | 1.082097E 04 | DYY | 2.307742E 02 | DZZ -5.146594E 02 |
| R | 6.704037E 06 | WT | 1.392939E 05 | F 2.060472E 05 |
| V | 1.083566E 04 | PTH | 6.970568E 00 | AZ 6.069508E 01 |
| ALT | 3.269009E 05 | LAT | -1.264117E 01 | LON 1.614006E 02 |
| VE | 1.042550E 04 | PTF | 7.246246E 00 | AZE 5.940150E 01 |
| ANG | 7.873483E 00 | NFA | 1.350062E 01 | IAC 1.630677E 01 |
| CPA | 1.140241E 00 | VPA | 1.139673E 00 | CYA 7.589741E 00 |
| VYA | 7.589832E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

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TABLE 10- CI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 4 APRIL 1968 22 HRS., 40 MIN., 39.051 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 9.5922108D 03
X 5.9220448D 06 Y-2.7786084D 06 Z-1.4672551D 06
DX 6.1886162D 03 DY 7.4563610D 03 DZ 4.8492462D 03
R 6.7040373D 06 DEC-1.2642167D 01 RA-2.5135850D 01
V 1.0835658D 04 PTH 6.9705671D 00 AZ 6.0693262D 01
ALT 3.2690207D 05 LTGD-1.2720549D 01 LON 1.6139987D 02
VE 1.0425508D 04 PTE 7.2063342D 00 AZE 5.9391062D 01

PERISELENUM
TIME 7 APRIL 1968 22 HRS., 40 MIN., 9.616 SEC., GMT
SELENOCENTRIC REFERENCE
XSC-1.1988452D 06 YSC 1.3080580D 06 ZSC 6.4947013D 05
DXSC 1.9506227D 03 DYSC 1.4075776D 03 DZSC 7.6570346D 02
RSC 1.8894594D 06 DESC 2.0104490D 01 RASC 1.3250549D 02
VSC 2.5243822D 03 PTSC 1.3036023D-12 AZSC-7.1155265D 01
SELENOGRAPHIC REFERENCE
XSG-1.8707939D 06 YSG 2.3438190D 05 ZSG 1.2349988D 05
DXSG 3.2449523D 02 DYSG 2.5030479D 03 DZSG 1.6513866D 02
HSG 1.5136994D 05 LTSG 3.7476697D 00 LNSG 1.7285891D 02
VRSG 2.5293906D 03 PTSG 2.7252304D-07 AZSG-8.6248577D 01
LTS-6.1378440D-02 LNS 6.1447821D 01 LTE-6.4197515D 00
LNE-7.3188912D 00 DSMP 4.9863833D-02 RSMP 6.8898890D 01
LIN 1.7469404D 02 LAN-1.4228729D 02 LAP 4.4976797D 01
GEOCENTRIC REFERENCE FLIGHT TIME 2.6876278D 05
X-2.4459756D 08 Y 2.6164374D 08 Z 1.4994907D 08
DX 1.2087231D 03 DY 7.8924052D 02 DZ 4.5554682D 02
R 3.8829131D 08 DEC 2.2716812D 01 RA 1.3307146D 02
V 1.5137487D 03 PTH-2.0320886D 00 AZ-7.0043406D 01
ALT 3.8191633D 08 LTGD 2.2719057D 01 LON 3.1677328D 02
VE 2.7544982D 04 PTE-1.1160905D-01 AZE-8.8925918D 01

FREE-RETURN VACUUM PERIGEE
TIME 10 APRIL 1968 17 HRS., 44 MIN., 30.663 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.1022382D 05
X 3.2112468D 06 Y-5.1475866D 06 Z-2.5659480D 06
DX 9.1091904D 03 DY 6.0219893D 03 DZ-6.7637260D 02
R 6.5874003D 06 DEC-2.2924860D 01 RA-5.8042621D 01
V 1.0940712D 04 PTH-8.9958321D-03 AZ 9.3852581D 01
ALT 2.1249378D 05 LTGD-2.3058747D 01 LON 1.9681698D 02
VE 1.0499334D 04 PTE-2.0163435D-12 AZE 9.4014810D 01

TABLE 10-C11 TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 21 HRS., 28 MIN., 25.900 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.524000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -6.236430E 06 | YYY | -5.203954E 04 | ZZZ | -2.077903E 06 |
| DXX | 2.457869E 03 | DYY | -9.021168E 01 | DZZ | -7.391091E 03 |
| R | 6.573693E 06 | WT | 2.986372E 05 | F | 1.697887E 01 |
| V | 7.789575E 03 | PTH | 3.842229E-02 | AZ | 8.795145E 01 |
| ALT | 2.006977E 05 | LAT | -2.939378E 01 | LON | 8.486684E 01 |
| VE | 7.372203E 03 | PTE | 4.059726E-02 | AZE | 8.783542E 01 |
| ANG | 3.873923E 00 | NFA | 8.778541E 01 | IAC | 9.228023E 00 |
| CPA | 6.773561E 01 | VPA | 6.773561E 01 | CYA | -6.314646E-01 |
| VYA | -6.314646E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.984000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -4.257490E 06 | YYY | -8.517914E 04 | ZZZ | -5.011304E 06 |
| DXX | 5.937045E 03 | DYY | -5.016544E 01 | DZZ | -5.049912E 03 |
| R | 6.576218E 06 | WT | 2.975038E 05 | F | 2.073030E 05 |
| V | 7.794398E 03 | PTH | 3.801540E-02 | AZ | 7.207667E 01 |
| ALT | 2.015471E 05 | LAT | -2.379186E 01 | LON | 1.174252E 02 |
| VE | 7.378136E 03 | PTE | 4.016016E-02 | AZE | 7.102797E 01 |
| ANG | 4.011436E 00 | NFA | 7.406839E 01 | IAC | 1.184881E 01 |
| CPA | 3.651398E 01 | VPA | 3.651398E 01 | CYA | -3.178505E-01 |
| VYA | -3.178505E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.317844E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -1.616770E 06 | YYY | -8.760447E 04 | ZZZ | -6.501860E 06 |
| DXX | 1.012393E 04 | DYY | 1.125073E 02 | DZZ | -3.869163E 03 |
| R | 6.700433E 06 | WT | 1.400747E 05 | F | 2.060472E 05 |
| V | 1.083868E 04 | PTH | 6.942945E 00 | AZ | 6.431595E 01 |
| ALT | 3.234789E 05 | LAT | -1.373698E 01 | LON | 1.418607E 02 |
| VE | 1.041624E 04 | PTE | 7.225993E 00 | AZE | 6.317530E 01 |
| ANG | 5.778350E 00 | NFA | 1.970680E 01 | IAC | 1.624731E 01 |
| CPA | 1.923907E 01 | VPA | 1.923826E 01 | CYA | 4.900734E 00 |
| VYA | 4.900848E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

TABLE 10- CII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 81 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 5 APRIL 1968 0 HRS., 3 MIN., 43.744 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 9.3178440D 03

| | | |
|-------------------|--------------------|-------------------|
| X 5.9529793D 06 | Y-2.6316981D 06 | Z-1.5912271D 06 |
| DX 6.0973614D 03 | DY 7.9057073D 03 | DZ 4.2188802D 03 |
| R 6.7004329D 06 | DEC-1.3737928D 01 | RA-2.3849302D 01 |
| V 1.0838680D 04 | PTH 6.9429432D 00 | AZ 6.4314109D 01 |
| ALT 3.2348005D 05 | LTGD-1.3822637D 01 | LON 1.4186000D 02 |
| VE 1.0416251D 04 | PTE 7.1877500D 00 | AZE 6.3163829D 01 |

PERISELENUM

TIME 7 APRIL 1968 23 HRS., 50 MIN., 58.974 SEC., GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2245794D 06 | YSC 1.2944867D 06 | ZSC 6.4631857D 05 |
| DXSC 1.9237430D 03 | DYSC 1.4139612D 03 | DZSC 8.1294603D 02 |
| RSC 1.8955259D 06 | DESC 1.9936017D 01 | RASC 1.3341037D 02 |
| VSC 2.5220932D 03 | PTSC 2.5861833D-12 | AZSC-6.9947733D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8775529D 06 | YSG 2.2796174D 05 | ZSG 1.2588530D 05 |
| DXSG 3.1722794D 02 | DYSG 2.4985786D 03 | DZSG 2.0679093D 02 |
| HSG 1.5743641D 05 | LTSG 3.8079188D 00 | LNSG 1.7307735D 02 |
| VRSG 2.5271112D 03 | PTSG 2.9634493D-07 | AZSG-8.5295883D 01 |
| LTS-6.0086475D-02 | LNS 6.0848735D 01 | LTE-6.3926991D 00 |
| LNE-7.3253467D 00 | DSMP 4.5407702D-02 | RSMP 6.8309496D 01 |
| LIN 1.7394330D 02 | LAN-1.4807190D 02 | LAP 3.9007502D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 26.6775307D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.4776050D 08 | Y 2.5898610D 08 | Z 1.4861847D 08 |
| DX 1.1891060D 03 | DY 7.8785372D 02 | DZ 4.9833325D 02 |
| R 3.8800324D 08 | DEC 2.2521748D 01 | RA 1.3373097D 02 |
| V 1.5109674D 03 | PTH-1.6136334D 00 | AZ-6.8354449D 01 |
| ALT 3.8162821D 08 | LTGD 2.2523980D 01 | LON 2.9967865D 02 |
| VE 2.7545336D 04 | PTE-8.8457183D-02 | AZE-8.8841072D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 10 APRIL 1968 18 HRS., 59 MIN., 56.714 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 56.0949081D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.2632996D 06 | Y-5.0678381D 06 | Z-2.4653925D 06 |
| DX 8.8951211D 03 | DY 6.3516313D 03 | DZ-1.2739870D 03 |
| R 6.5123166D 06 | DEC-2.2245368D 01 | RA-5.7221564D 01 |
| V 1.1004065D 04 | PTH-1.6563327D-02 | AZ 9.7192435D 01 |
| ALT 1.3722983D 05 | LTGD-2.2377660D 01 | LON 1.7872786D 02 |
| VE 1.0568126D 04 | PTE 2.8309129D-12 | AZE 9.7490813D 01 |

05-15481-1

TABLE 10-CIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 22 HRS., 48 MIN., 21.860 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.568371E 06 | YYY | -1.837218E 04 |
| DXX | 1.906702E 02 | DYY | -4.272245E 01 |
| R | 6.570464E 06 | WT | 2.991564E C5 |
| V | 7.792861E 03 | PTH | 3.606978E-C2 |
| ALT | 1.971657E 05 | LAT | -2.843839E 01 |
| VE | 7.371633E 03 | PTE | 3.813102E-02 |
| ANG | 3.872577E 00 | NFA | 8.889122E C1 |
| CPA | 8.472793E 01 | VPA | 8.472793E C1 |
| VYA | -3.025962E-01 | CRA | -0.000000E-39 |
| | | FLIGHT TIME | 8.271000E 03 |
| | | ZZZ | -1.647978E 05 |
| | | DZZ | -7.790411E 03 |
| | | F | 1.792441E 01 |
| | | AZ | 8.890343E 01 |
| | | LON | 6.647351E 01 |
| | | AZE | 8.884076E 01 |
| | | IAC | 9.237702E 00 |
| | | CYA | -3.025962E-01 |
| | | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.532091E 06 | YYY | -3.558545E 04 |
| DXX | 4.205937E 03 | DYY | -3.012791E 01 |
| R | 6.573128E 06 | WT | 2.980222E 05 |
| V | 7.797389E 03 | PTH | 4.476582E-C2 |
| ALT | 1.983677E 05 | LAT | -2.346779E 01 |
| VE | 7.377099E 03 | PTE | 4.731681E-02 |
| ANG | 3.593320E 00 | NFA | 7.552772E 01 |
| CPA | 5.348674E 01 | VPA | 5.348674E 01 |
| VYA | -1.999546E-01 | CRA | -0.000000E-39 |
| | | FLIGHT TIME | 8.731000E 03 |
| | | ZZZ | -3.549749E 06 |
| | | DZZ | -6.565704E 03 |
| | | F | 2.073030E 05 |
| | | AZ | 7.340499E 01 |
| | | LON | 9.898455E 01 |
| | | AZE | 7.242965E 01 |
| | | IAC | 1.184780E 01 |
| | | CYA | -1.999546E-01 |
| | | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -3.432723E 06 | YYY | -3.614239E 04 |
| DXX | 8.565700E 03 | DYY | 9.058406E 01 |
| R | 6.698315E 06 | WT | 1.403692E 05 |
| V | 1.084041E 04 | PTH | 6.964273E 00 |
| ALT | 3.213939E 05 | LAT | -1.392473E 01 |
| VE | 1.041432E 04 | PTE | -7.250705E 00 |
| ANG | 5.107139E 00 | NFA | 2.360869E 01 |
| CPA | 3.603486E 01 | VPA | 3.603410E 01 |
| VYA | 4.074738E 00 | CRA | -0.000000E-39 |
| | | FLIGHT TIME | 9.065941E 03 |
| | | ZZZ | -5.751742E 06 |
| | | DZZ | -6.643421E 03 |
| | | F | 2.060472E 05 |
| | | AZ | 6.545733E 01 |
| | | LON | 1.237303E 02 |
| | | AZE | 6.436512E 01 |
| | | IAC | 1.622737E 01 |
| | | CYA | 4.074658E 00 |
| | | VRA | 0.000000E-39 |

TABLE 10- CIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 5 APRIL 1968 1 HRS., 19 MIN., 27.801 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 9.0659408D 03

| | | |
|-------------------|--------------------|-------------------|
| X 5.9848615D 06 | Y-2.5397257D 06 | Z-1.6120338D 06 |
| DX 5.9882903D 03 | DY 8.0917802D 03 | DZ 4.8221812D 03 |
| R 6.6983152D 06 | DEC-1.3925648D 01 | RA-2.2994343D 01 |
| V 1.0840409D 04 | PTH 6.9642733D 00 | AZ 6.5455474D 01 |
| ALT 3.2139504D 05 | LTGD-1.4011449D 01 | LON 1.2372955D 02 |
| VE 1.0414331D 04 | PTE 7.2135706D 00 | AZE 6.4353377D 01 |

PERISELENUM
TIME 8 APRIL 1968 0 HRS., 59 MIN., 54.664 SEC., GMT
SELENCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2466954D 06 | YSC 1.2830857D 06 | ZSC 6.4319925D 05 |
| DXSC 1.9006229D 03 | DYSC 1.4284943D 03 | DZSC 8.3429411D 02 |
| RSC 1.9011217D 06 | DESC 1.9774928D 01 | RASC 1.3417586D 02 |
| VSC 2.5197242D 03 | PTSC 3.2224928D-12 | AZSC-6.9399205D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8834429D 06 | YSG 2.2508160D 05 | ZSG 1.2745520D 05 |
| DXSG 3.1319924D 02 | DYSG 2.4954550D 03 | DZSG 2.2134764D 02 |
| HSG 1.6303220D 05 | LTSG 3.8441129D 00 | LNSG 1.7318515D 02 |
| VRSG 2.5247543D 03 | PTSG 3.0018506D-07 | AZSG-8.4958991D 01 |
| LTS-5.8823273D-02 | LNS 6.0265686D 01 | LTE-6.2655651D 00 |
| LNE-7.3307123D 00 | DSMP 4.1071418D-02 | RSMP 6.7734904D 01 |
| LIN 1.7365560D 02 | LAN-1.4963373D 02 | LAP 3.7350709D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.6709280D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.5080605D 08 | Y 2.5636978D 08 | Z 1.4730529D 08 |
| DX 1.1731587D 03 | DY 7.9488343D 02 | DZ 5.1537289D 02 |
| R 3.8772153D 08 | DEC 2.2329066D 01 | RA 1.3437148D 02 |
| V 1.5078959D 03 | PTH-1.4245002D 00 | AZ-6.7677717D 01 |
| ALT 3.8134645D 08 | LTGD 2.2331285D 01 | LON 2.8303995D 02 |
| VE 2.7553542D 04 | PTE-7.7903136D-02 | AZE-8.8809334D 01 |

FREE-RETURN VACUUM PERIGEE
TIME 10 APRIL 1968 20 HRS., 8 MIN., 33.616 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.0881176D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.2800923D 06 | Y-4.9442253D 06 | Z-2.3911124D 06 |
| DX 8.8424008D 03 | DY 6.5621726D 03 | DZ-1.4294670D 03 |
| R 6.3970139D 06 | DEC-2.1949281D 01 | RA-5.6438951D 01 |
| V 1.1103762D 04 | PTH-1.8514818D-02 | AZ 9.7985823D 01 |
| ALT 2.1850133D 04 | LTGD-2.2082550D 01 | LON 1.6230976D 02 |
| VE 1.0675462D 04 | PTE 3.8312301D-12 | AZE 9.8308457D 01 |

TABLE 10-CIV TRANSUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 23 HRS..45 MIN..41.840 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.093000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.456405E 06 | YYY | -1.137982E C4 | ZZZ 1.207106E 06 |
| DXX | -1.436723E 03 | DYY | 1.673770E 01 | DZZ -7.661066E 03 |
| R | 6.568287E 06 | WT | 2.988321E 05 | F 1.859437E 01 |
| V | 7.794639E 03 | PTH | 3.151392E-C2 | AZ 8.702356E 01 |
| ALT | 1.953677E 05 | LAT | -2.963031E C1 | LON 5.351110E 01 |
| VE | 7.378898E 03 | PTE | 3.328945E-02 | AZE 8.685570E 01 |
| ANG | 3.875427E 00 | NFA | 8.742478E C1 | IAC 9.243078E 00 |
| CPA | 9.675163E 01 | VPA | 9.675163E 01 | CYA 1.294571E-01 |
| VYA | 1.294571E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.553000F 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.147556E 06 | YYY | -3.606671E 03 | ZZZ -2.320317E 06 |
| DXX | 2.748214E 03 | DYY | 1.641268E 01 | DZZ -7.299238E 03 |
| R | 6.570870E 06 | WT | 2.976973E 05 | F 2.073030E 05 |
| V | 7.799476E 03 | PTH | 4.660160E-02 | AZ 7.118399E 01 |
| ALT | 1.961222E 05 | LAT | -2.351578E C1 | LON 8.601118E 01 |
| VE | 7.384954E 03 | PTF | 4.921716E-C2 | AZE 7.008449E 01 |
| ANG | 4.025452E 00 | NFA | 7.411329E 01 | IAC 1.185771E 01 |
| CPA | 6.549829E 01 | VPA | 6.549829E 01 | CYA 1.224235E-01 |
| VYA | 1.224235E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TRANSUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.888296E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -4.550886E 06 | YYY | 1.305991E C4 | ZZZ -4.913848E 06 |
| DXX | 6.994546E 03 | DYY | 1.644836E C2 | DZZ -8.281018E 03 |
| R | 6.697510E 06 | WT | 1.401783E C5 | F 2.060472E 05 |
| V | 1.084094E 04 | PTH | 7.010991E C0 | AZ 6.370314E 01 |
| ALT | 3.204447E 05 | LAT | -1.307837E C1 | LON 1.103555E 02 |
| VE | 1.041990E 04 | PTE | -7.295796E C0 | AZE 6.253472E 01 |
| ANG | 6.099773E 00 | NFA | 2.001567E C1 | IAC 1.624077E 01 |
| CPA | 4.801655E 01 | VPA | 4.801596E 01 | CYA 5.444042E 00 |
| VYA | 5.444091E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10- CIV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 99 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION
 TIME 5 APRIL 1968 2 HRS., 13 MIN., 50.136 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 8.8882960D 03

| | | |
|-------------------|--------------------|-------------------|
| X 6.0167098D 06 | Y-2.5216421D 06 | Z-1.5156397D 06 |
| DX 5.9122545D 03 | DY 7.9812535D 03 | DZ 4.3440575D 03 |
| R 6.6975099D 06 | DEC-1.3079275D 01 | RA-2.2738873D 01 |
| V 1.0840941D 04 | PTH 7.0109900D 00 | AZ 6.3701283D 01 |
| ALT 3.2044573D 05 | LTGD-1.3160256D 01 | LON 1.1035474D 02 |
| VE 1.0419910D 04 | PTE 7.2584315D 00 | AZE 6.2523619D 01 |

PERISELENUM
 TIME 8 APRIL 1968 1 HRS., 56 MIN., 19.733 SEC.,GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2718001D 06 | YSC 1.2838801D 06 | ZSC 6.4225811D 05 |
| DXSC 1.8778212D 03 | DYSC 1.4472383D 03 | DZSC 8.2542017D 02 |
| RSC 1.9178945D 06 | DESC 1.9565037D 01 | RASC 1.9472917D 02 |
| VSC 2.5103844D 03 | PTSC 3.4357423D-12 | AZSC-6.0576891D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.9003678D 06 | YSG 2.2564807D 05 | ZSG 1.2650797D 05 |
| DXSG 3.0913939D 02 | DYSG 2.4878543D 03 | DZSG 2.0630377D 02 |
| HSG 1.7980497D 05 | LTSG 3.7820845D 00 | LNSG 1.7322844D 02 |
| VRSG 2.5154616D 03 | PTSG 2.9829405D-07 | AZSG-8.5285348D 01 |
| LTS-5.7785072D-02 | LNS 5.9788470D 01 | LTE-6.3427645D 00 |
| LNE-7.3344281D 00 | DSMP 3.7522642D-02 | RSMP 6.7263888D 01 |
| LIN 1.7395113D 02 | LAN-1.4817462D 02 | LAP 3.8752977D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.6703789D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.5328363D 08 | Y 2.5421542D 08 | Z 1.4621884D 08 |
| DX 1.1563042D 03 | DY 8.0753008D 02 | DZ 5.0299387D 02 |
| R 3.8750229D 08 | DEC 2.2168809D 01 | RA 1.3489479D 02 |
| V 1.4973800D 03 | PTH-1.3864326D 00 | AZ-6.8117881D 01 |
| ALT 3.8112717D 08 | LTGD 2.2171016D 01 | LON 2.8942019D 02 |
| VE 2.7563000D 04 | PTE-7.5266960D-02 | AZE-8.8840178D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 10 APRIL 1968 21 HRS., 5 MIN., 35.658 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.0879382D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.2260980D 06 | Y-4.7361498D 06 | Z-2.8203239D 06 |
| DX 9.0151064D 03 | DY 6.7093472D 03 | DZ-1.1525421D 03 |
| R 6.1824531D 06 | DEC-2.2043347D 01 | RA-5.5738688D 01 |
| V 1.1296718D 04 | PTH-1.5247080D-02 | AZ 9.6325595D 01 |
| ALT-1.9268564D 05 | LTGD-2.2181732D 01 | LON 1.4871248D 02 |
| VE 1.0881484D 04 | PTE 7.8337312D-13 | AZE 9.6568040D 01 |

TABLE 10-CV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 24 HRS., 21 MIN., 22.420 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -6.256097E 06 | YYY -1.904436E C4 | ZZZ 1.996916E 06 | 03 |
| DXX -2.374262E 03 | DYY 7.655513E C1 | DZZ -7.424295E 03 | |
| R 6.567098E 06 | WT 2.976728E C5 | F 1.899243E 01 | |
| V 7.795071E 03 | PTH 2.961727E-C2 | AZ 8.288003E 01 | |
| ALT 1.951019E 05 | LAT -3.242650E C1 | LON 4.591606E 01 | |
| VE 7.394145E 03 | PTE 3.122304E-02 | AZE 8.249180E 01 | |
| ANG 3.891003E 00 | NFA 8.414126E C1 | IAC 9.244594E 00 | |
| CPA 1.038639E 02 | VPA 1.038639E C2 | CYA 5.726610E-01 | |
| VYA 5.726610E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -6.386183E 06 | YYY 1.598454E C4 | ZZZ -1.541749E 06 | 03 |
| DXX 1.824339E 03 | DYY 7.225063E 01 | DZZ -7.583737E 03 | |
| R 6.569671E 06 | WT 2.965376E C5 | F 2.073030E 05 | |
| V 7.800417E 03 | PTH 4.786571E-C2 | AZ 6.625726E 01 | |
| ALT 1.950066E 05 | LAT -2.381680E C1 | LON 7.826465E 01 | |
| VE 7.401344E 03 | PTE 5.044658E-02 | AZE 6.489110E 01 | |
| ANG 4.106161E 00 | NFA 7.072566E C1 | IAC 1.187754E 01 | |
| CPA 7.260382E 01 | VPA 7.260382E C1 | CYA 5.201155E-01 | |
| VYA 5.201155E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -5.126560E 06 | YYY 5.705900E C4 | ZZZ -4.310702E 06 | 03 |
| DXX 5.899960E 03 | DYY 2.925097E 02 | DZZ -9.089132E 03 | |
| R 6.698286E 06 | WT 1.394862E C5 | F 2.060472E 05 | |
| V 1.084008E 04 | PTH 7.080939E C0 | AZ 5.974014E 01 | |
| ALT 3.209713E 05 | LAT -1.147793E 01 | LON 1.015421E 02 | |
| VE 1.043269E 04 | PTE 7.358947E C0 | AZE 5.840427E 01 | |
| ANG 8.220437E 00 | NFA 1.377566E C1 | IAC 1.626951E 01 | |
| CPA 5.534786E 01 | VPA 5.534719E C1 | CYA 8.209940E 00 | |
| VYA 8.210055E 00 | CRA -0.000000E-39 | VRA 0.000000E-39 | |

TABLE 10- CV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 108 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 5 APRIL 1968 2 HRS., 47 MIN., 46.347 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 8.7839269D 03

| | | |
|-------------------|--------------------|-------------------|
| X 6.040469D 06 | Y-2.5696064D 06 | Z-1.3329999D 06 |
| DX 5.8349769D 03 | DY 7.6151082D 03 | DZ 5.0468393D 03 |
| R 6.6982858D 06 | DEC-1.1478846D 01 | RA-2.3044826D 01 |
| V 1.0840084D 04 | PTH 7.0809390D 00 | AZ 5.9738295D 01 |
| ALT 3.2097235D 05 | LTGD-1.1550494D 01 | LON 1.0154135D 02 |
| VE 1.0432702D 04 | PTE 7.3213959D 00 | AZE 5.8394493D 01 |

PERISELENUM

TIME 8 APRIL 1968 2 HRS., 39 MIN., 20.846 SEC.,GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2995206D 06 | YSC 1.2956815D 06 | ZSC 6.4316696D 05 |
| DXSC 1.8559350D 03 | DYSC 1.4675334D 03 | DZSC 7.9352635D 02 |
| RSC 1.9445328D 06 | DESC 1.9314700D 01 | RASC 1.3508475D 02 |
| VSC 2.4955627D 03 | PTSC 2.0552797D-12 | AZSC-7.0309495D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.9270812D 06 | YSG 2.2889376D 05 | ZSG 1.2318082D 05 |
| DXSG 3.0494872D 02 | DYSG 2.4762712D 03 | DZSG 1.6932789D 02 |
| HSG 2.0644333D 05 | LTSG 3.6319620D 00 | LNSG 1.7322628D 02 |
| VRSG 2.5007169D 03 | PTSG 2.9475395D-07 | AZSG-8.6109602D 01 |
| LTS-5.6990857D-02 | LNS 5.9424599D 01 | LTE-6.3250210D 00 |
| LNE-7.3368511D 00 | DSMP 3.4816997D-02 | RSMP 6.6904306D 01 |
| LIN 1.7467386D 02 | LAN-1.4386276D 02 | LAP 4.3034585D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.6747843D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.5516776D 08 | Y 2.5257010D 08 | Z 1.4538410D 08 |
| DX 1.1389988D 03 | DY 8.2320311D 02 | DZ 4.6844058D 02 |
| R 3.8734839D 08 | DEC 2.2044809D 01 | RA 1.8529312D 02 |
| V 1.4813568D 03 | PTH-1.4595558D 00 | AZ-6.9415105D 01 |
| ALT 3.8097324D 08 | LTGD 2.2047007D 01 | LON 2.5903444D 02 |
| VE 2.7572118D 04 | PTE-7.8367044D-02 | AZE-8.8917961D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 10 APRIL 1968 21 HRS., 50 MIN., 15.249 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.0933283D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.1097072D 06 | Y-4.4563935D 06 | Z-2.2409332D 06 |
| DX 9.3647145D 03 | DY 6.8050664D 03 | DZ-5.3361244D 02 |
| R 5.8780528D 06 | DEC-2.2410346D 01 | RA-5.5092352D 01 |
| V 1.1588423D 04 | PTH-7.3543632D-03 | AZ 9.2858042D 01 |
| ALT-4.9698873D 05 | LTGD-2.2557841D 01 | LON 1.3816328D 02 |
| VE 1.1192671D 04 | PTE-4.0775439D-12 | AZE 9.2959196D 01 |

TABLE 10-CVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 20 HRS..00 MIN..46.840 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -5.189270E 06 | YYY -1.161828E 05 | ZZZ -4.048735E 06 | 04 |
| DXX 4.784362E 03 | DYY -1.396454E 02 | DZZ -6.136000E 03 | 03 |
| R 6.582878E 06 | WT 2.962717E 05 | F 1.408485E 01 | 01 |
| V 7.782038E 03 | PTH 3.569740E-02 | AZ 8.351659E 01 | 01 |
| ALT 2.107299E 05 | LAT -3.197652E 01 | LON 8.449164E 01 | 01 |
| VE 7.377592E 03 | PTE 3.765444E-02 | AZE 8.315951E 01 | 01 |
| ANG 3.888379E 00 | NFA 8.364903E 01 | IAC 9.200606E 00 | 00 |
| CPA 4.818581E 01 | VPA 4.818581E 01 | CYA -9.576420E-01 | 01 |
| VYA -9.576420E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -2.346514E 06 | YYY -1.617670E 05 | ZZZ -6.150473E 06 | 06 |
| DXX 7.275551E 03 | DYY -5.344688E 01 | DZZ -2.777852E 03 | 03 |
| R 6.584878E 06 | WT 2.951410E 05 | F 2.073030E 05 | 05 |
| V 7.788000E 03 | PTH 2.409169E-02 | AZ 6.707209E 01 | 01 |
| ALT 2.102083E 05 | LAT -2.379770E 01 | LON 1.167448E 02 | 02 |
| VE 7.385344E 03 | PTE 2.540555E-02 | AZE 6.574412E 01 | 01 |
| ANG 4.092450E 00 | NFA 6.961912E 01 | IAC 1.186533E 01 | 01 |
| CPA 1.702829E 01 | VPA 1.702829E 01 | CYA -2.973216E-01 | 01 |
| VYA -2.973216E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX 4.839651E 05 | YYY -1.684796E 05 | ZZZ -6.676306E 06 | 06 |
| DXX 1.083277E 04 | DYY 1.370687E 01 | DZZ -4.513657E 02 | 02 |
| R 6.695944E 06 | WT 1.389811E 05 | F 2.060472E 05 | 05 |
| V 1.084218E 04 | PTH 6.528147E 00 | AZ 5.963582E 01 | 01 |
| ALT 3.187710E 05 | LAT -1.240836E 01 | LON 1.389347E 02 | 02 |
| VE 1.043628E 04 | PTE 6.783217E 00 | AZE 5.830296E 01 | 01 |
| ANG 2.682823E 00 | NFA 6.010741E 01 | IAC 1.645380E 01 | 01 |
| CPA 2.820349E-01 | VPA 2.827931E-01 | CYA 7.950840E-02 | 02 |
| VYA 7.953672E-02 | CRA -0.000000E-39 | VRA 0.000000E-39 | 39 |

TABLE 10- CVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - SECOND OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 5 APRIL 1968 0 HRS., 9 MIN., 5.930 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4899090D 04

| | | |
|-------------------|---------------------|-------------------|
| X 5.9059360D 06 | Y -2.8080390D 06 | Z -1.4389257D 06 |
| DX 6.1349109D 03 | DY 7.3742676D 03 | DZ 5.0533051D 03 |
| R 6.6959443D 06 | DEC -1.2409373D 01 | RA -2.5429238D 01 |
| V 1.0842179D 04 | PTH 6.5281445D 00 | AZ 5.9634010D 01 |
| ALT 3.1877205D 05 | LTGD -1.2486499D 01 | LON 1.3893395D 02 |
| VE 1.0436288D 04 | PTE 6.7426786D 00 | AZE 5.8293306D 01 |

PERISELENUM

TIME 8 APRIL 1968 0 HRS., 5 MIN., 51.790 SEC.,GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|---------------------|---------------------|
| XSC -1.2225891D 06 | YSC 1.2952245D 06 | ZSC 6.4695200D 05 |
| DXSC 1.2253662D 03 | DYSC 1.4368017D 03 | DZSC 7.6384865D 02 |
| RSC 1.2259611D 06 | DESC 1.9962587D 01 | RASC 1.3334755D 02 |
| VSC 2.5210563D 03 | PTSC 3.5915250D -13 | AZSC -7.1199169D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|---------------------|---------------------|---------------------|
| XSG -1.0761636D 06 | YSG 2.3445081D 05 | ZSG 1.2617623D 05 |
| DXSG 3.27184015D 02 | DYSG 2.5013144D 03 | DZSG 1.5268932D 02 |
| HSG 1.0087163D 05 | LTSG 3.8178715D 00 | LNSG 1.7287707D 02 |
| VRS 2.0000004D 03 | PTSG 3.0111884D -07 | AZSG -8.6527739D 01 |
| LTS -5.0000000D -02 | LNS 6.0722865D 01 | LTE -6.3869087D 00 |
| LNE -7.00000017D 00 | OSMP 4.4471528D -02 | RSMP 6.8185533D 01 |
| LIN 1.70000045D 02 | LAN -1.3952073D 02 | LAP 4.7718173D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7390495D 05

| | | |
|-------------------|---------------------|--------------------|
| X -2.4841372D 08 | Y 2.5842712D 08 | Z 1.4833780D 08 |
| DX 1.1932689D 03 | DY 8.0906947D 02 | DZ 4.4830336D 02 |
| R 3.8794078D 08 | DEC 2.2480703D 01 | RA 1.3386818D 02 |
| V 1.5097881D 03 | PTH -2.0389203D 00 | AZ -7.0349163D 01 |
| ALT 3.8156574D 08 | LTGD 2.2482932D 01 | LON 2.9608561D 02 |
| VE 2.7565034D 04 | PTE -1.1161092D -01 | AZE -8.8945262D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 10 APRIL 1968 19 HRS., 4 MIN., 2.015 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.1499518D 05

| | | |
|-------------------|---------------------|-------------------|
| X 3.1974127D 06 | Y -4.9389173D 06 | Z -2.5013699D 06 |
| DX 9.2567450D 03 | DY 6.1328354D 03 | DZ -2.7477526D 02 |
| R 6.3932155D 06 | DEC -2.3032537D 01 | RA -5.7081323D 01 |
| V 1.1107407D 04 | PTH -3.7261145D -03 | AZ 9.1541927D 01 |
| ALT 1.8338435D 04 | LTGD -2.3171010D 01 | LON 1.7784322D 02 |
| VE 1.0678533D 04 | PTE 4.9576407D -12 | AZE 9.1603875D 01 |

TABLE 10-CVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 21 HRS..28 MIN..25.900 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -6.190774E 06 | YYY -5.630443E 04 | ZZZ -2.225931E 06 | 04 |
| DXX 2.629776E 03 | DYY -1.208604E 02 | DZZ -7.327753E 03 | 03 |
| R 6.579029E 06 | WT 2.976061E 05 | F 1.509349E 01 | 01 |
| V 7.786289E 03 | PTH 4.197419E-02 | AZ 8.695689E 01 | 01 |
| ALT 2.060080E 05 | LAT -2.931486E 01 | LON 6.416413E 01 | 01 |
| VE 7.368597E 03 | PTE 4.435347E-02 | AZE 8.678421E 01 | 01 |
| ANG 3.876235E 00 | NFA 8.689614E 01 | IAC 9.213101E 00 | 00 |
| CPA 6.638772E 01 | VPA 6.638772E 01 | CYA -8.543098E-01 | 01 |
| VYA -8.543098E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -4.145209E 06 | YYY -1.022509E 05 | ZZZ -5.111348E 06 | 06 |
| DXX 6.048242E 03 | DYY -7.383291E 01 | DZZ -4.910497E 03 | 03 |
| R 6.581724E 06 | WT 2.964746E 05 | F 2.073030E 05 | 05 |
| V 7.790999E 03 | PTH 3.975890E-02 | AZ 7.136123E 01 | 01 |
| ALT 2.069044E 05 | LAT -2.325024E 01 | LON 9.648658E 01 | 01 |
| VE 7.374503E 03 | PTE 4.200410E-02 | AZE 7.026618E 01 | 01 |
| ANG 4.023895E 00 | NFA 7.327175E 01 | IAC 1.185126E 01 | 01 |
| CPA 3.520307E 01 | VPA 3.520307E 01 | CYA -4.816906E-01 | 01 |
| VYA -4.816906E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -1.603859E 06 | YYY -1.210741E 05 | ZZZ -6.499696E 06 | 06 |
| DXX 1.015740E 04 | DYY -4.331272E 01 | DZZ -3.792572E 03 | 03 |
| R 6.695750E 06 | WT 1.396079E 05 | F 2.060472E 05 | 05 |
| V 1.084243E 04 | PTH 6.616327E 00 | AZ 6.352221E 01 | 01 |
| ALT 3.187443E 05 | LAT -1.343424E 01 | LON 1.196467E 02 | 02 |
| VE 1.042244E 04 | PTE 6.884208E 00 | AZE 6.234970E 01 | 01 |
| ANG 2.630380E 00 | NFA 6.325496E 01 | IAC 1.638650E 01 | 01 |
| CPA 1.837452E 01 | VPA 1.837379E 01 | CYA -2.143544E-01 | 01 |
| VYA -2.143326E-01 | CRA -0.000000E-39 | VRA 0.000000E-39 | 39 |

TABLE 10- CVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 5 APRIL 1968 1 HRS., 32 MIN., 11.826 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.4625926D 04

| | | |
|-------------------|--------------------|-------------------|
| X 5.9547447D 06 | Y-2.6370062D 06 | Z-1.5557264D 06 |
| DX 6.0347353D 03 | DY 7.8709010D 03 | DZ 4.3805365D 03 |
| R 6.6957502D 06 | DEC-1.3435191D 01 | RA-2.3885734D 01 |
| V 1.0842427D 04 | PTH 6.6163260D 00 | AZ 6.3520374D 01 |
| ALT 3.1874555D 05 | LTGD-1.3518234D 01 | LON 1.1964601D 02 |
| VE 1.0422445D 04 | PTE 6.8456556D 00 | AZE 6.2338931D 01 |

PERISELENUM

TIME 8 APRIL 1968 1 HRS., 15 MIN., 44.438 SEC.,GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2421874D 06 | YSC 1.2775876D 06 | ZSC 6.4150631D 05 |
| DXSC 1.9036670D 03 | DYSC 1.4419013D 03 | DZSC 8.1457634D 02 |
| RSC 1.8938822D 06 | DESC 1.9799246D 01 | RASC 1.3419510D 02 |
| VSC 2.5232047D 03 | PTSC 2.8204443D-14 | AZSC-6.9933083D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8756793D 06 | YSG 2.2860131D 05 | ZSG 1.2790049D 05 |
| DXSG 3.1822826D 02 | DYSG 2.5002828D 03 | DZSG 1.9801534D 02 |
| HSG 1.5579275D 05 | LTSG 3.8723313D 00 | LNSG 1.7305125D 02 |
| VRSG 2.5282194D 03 | PTSG 2.9997859D-07 | AZSG-8.5497571D 01 |
| LTS-5.8532366D-02 | LNS 6.0131789D 01 | LTF-6.3592215D 00 |
| LNE-7.3318164D 00 | DSMP 4.0075667D-02 | RSMP 6.7602812D 01 |
| LIN 1.7405730D 02 | LAN-1.4638716D 02 | LAP 4.0714157D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7283854D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.5149168D 08 | Y 2.5576168D 08 | Z 1.4700023D 08 |
| DX 1.1778644D 03 | DY 8.0657567D 02 | DZ 4.9466971D 02 |
| R 3.8764825D 08 | DEC 2.2284777D 01 | RA 1.3451769D 02 |
| V 1.5108366D 03 | PTH-1.6844065D 00 | AZ-6.8527948D 01 |
| ALT 3.8127316D 08 | LTGD 2.2286993D 01 | LON 2.7921794D 02 |
| VE 2.7567402D 04 | PTE-9.2256531D-02 | AZE-8.8850983D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 10 APRIL 1968 20 HRS., 16 MIN., 9.763 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.1406386D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.2871035D 06 | Y-4.9440424D 06 | Z-2.4359105D 06 |
| DX 8.9808258D 03 | DY 6.4327495D 03 | DZ-9.3094686D 02 |
| R 6.4173410D 06 | DEC-2.2307824D 01 | RA-5.6381593D 01 |
| V 1.1086125D 04 | PTH-1.2225089D-02 | AZ 9.5212781D 01 |
| ALT 4.2270822D 04 | LTGD-2.2442381D 01 | LON 1.6046130D 02 |
| VE 1.0655051D 04 | PTE 3.7140651D-12 | AZE 9.5424310D 01 |

TABLE 10-CVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 22 HRS..48 MIN..21.860 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.567595E 06 | YYY | -2.093289E 04 |
| ZZZ | -3.248204E 05 | DDZ | -7.780135E 03 |
| DXX | 3.795572E 02 | DYY | -7.373095E 01 |
| R | 6.575660E 06 | WT | 2.981207E 05 |
| F | 1.639437E 01 | PTH | 4.016776E-02 |
| V | 7.789737E 03 | AZ | 8.791718E 01 |
| ALT | 2.023455E 05 | LAT | -2.838795E 01 |
| LON | 4.581376E 01 | VE | 7.368188E 03 |
| AZE | 8.779796E 01 | PTE | 4.246570E-02 |
| ANG | 3.874132E 00 | NFA | 8.801701E 01 |
| IAC | 9.223131E 00 | CPA | 8.333687E 01 |
| CYA | -5.288001E-01 | VPA | 8.333687E 01 |
| VYA | -5.288001E-01 | CRA | -0.000000E-39 |
| VRA | -0.000000E-39 | | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.450977E 06 | YYY | -5.134166E 04 |
| ZZZ | -3.682596E 06 | DDZ | -6.461596E 03 |
| DXX | 4.358049E 03 | DYY | -5.507732E 01 |
| R | 6.578549E 06 | WT | 2.969880E 05 |
| F | 2.073030E 05 | PTH | 4.766202E-02 |
| V | 7.794091E 03 | AZ | 7.267263E 01 |
| ALT | 2.036473E 05 | LAT | -2.294820E 01 |
| LON | 7.811077E 01 | VE | 7.373562E 03 |
| AZE | 7.165024E 01 | PTE | 5.038006E-02 |
| ANG | 4.005219E 00 | NFA | 7.472611E 01 |
| IAC | 1.185031E 01 | CPA | 5.213219E 01 |
| CYA | -3.738060E-01 | VPA | 5.213219E 01 |
| VYA | -3.738060E-01 | CRA | -0.000000E-39 |
| VRA | -0.000000E-39 | | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -3.415592E 06 | YYY | -6.734854E 04 |
| ZZZ | -5.756767E 06 | DDZ | -6.577161E 03 |
| DXX | 8.621259E 03 | DYY | -4.461430E 01 |
| R | 6.654114E 06 | WT | 1.398629E 05 |
| F | 2.060472E 05 | PTH | 6.660605E 00 |
| V | 1.084376E 04 | AZ | 6.476096E 01 |
| ALT | 3.171402E 05 | LAT | -1.361992E 01 |
| LON | 1.015783E 02 | VE | 1.041961E 04 |
| AZE | 6.364034E 01 | PTE | 6.933041E 00 |
| ANG | 2.616973E 00 | NFA | 6.440848E 01 |
| IAC | 1.635984E 01 | CPA | 3.524232E 01 |
| CYA | -2.209003E-01 | VPA | 3.524232E 01 |
| VYA | -2.208500E-01 | CRA | -0.000000E-39 |
| VRA | 0.000000E-39 | | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|--------------|-----------------|----------|----------------|---------------|
| TIME | 6 APRIL 1968 | 8 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.8413009D 05 |
| X-1.6597305D | 06 | Y 1.3437956D | 08 | Z 8.3975420D | 07 |
| DX-4.3794637D | 02 | DY-1.6644513D | 03 | DZ-8.6672125D | 02 |
| R 1.5846921D | 08 | DEC 3.1999798D | 01 | RA 9.0707623D | 01 |
| V 1.9270186D | 03 | PTH-7.5558836D | 01 | AZ 7.2555853D | 01 |
| ALT 1.5209705D | 08 | LTGD 3.2006742D | 01 | LON 1.3145577D | 02 |
| VE 9.5270551D | 03 | PTE-1.1295865D | 01 | AZE-8.9115059D | 01 |
| | | | | | |
| TIME | 6 APRIL 1968 | 8 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.8593009D 05 |
| X-2.4477538D | 06 | Y 1.3136148D | 08 | Z 8.2401508D | 07 |
| DX-4.3760618D | 02 | DY-1.6891381D | 03 | DZ-8.8218778D | 02 |
| R 1.5508656D | 08 | DEC 3.2095085D | 01 | RA 9.1067505D | 01 |
| V 1.9552345D | 03 | PTH-7.5453405D | 01 | AZ 7.2749302D | 01 |
| ALT 1.4871442D | 08 | LTGD 3.2102192D | 01 | LON 1.2429512D | 02 |
| VE 9.3073059D | 03 | PTE-1.1732286D | 01 | AZE-8.9082824D | 01 |
| | | | | | |
| TIME | 6 APRIL 1968 | 9 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.8773009D 05 |
| X-3.2350021D | 06 | Y 1.2829801D | 08 | Z 8.0799099D | 07 |
| DX-4.3708137D | 02 | DY-1.7149080D | 03 | DZ-8.9839493D | 02 |
| R 1.5165533D | 08 | DEC 3.2193556D | 01 | RA 9.1444388D | 01 |
| V 1.9847073D | 03 | PTH-7.5341697D | 01 | AZ 7.2952169D | 01 |
| ALT 1.4528323D | 08 | LTGD 3.2200836D | 01 | LON 1.1715147D | 02 |
| VE 9.0848908D | 03 | PTE-1.2201471D | 01 | AZE-8.9048309D | 01 |
| | | | | | |
| TIME | 6 APRIL 1968 | 9 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.8953009D 05 |
| X-4.0211212D | 06 | Y 1.2518711D | 08 | Z 7.9166803D | 07 |
| DX-4.3634712D | 02 | DY-1.7418503D | 03 | DZ-9.1540745D | 02 |
| R 1.4817343D | 08 | DEC 3.2295416D | 01 | RA 9.1839754D | 01 |
| V 2.0155426D | 03 | PTH-7.5223155D | 01 | AZ 7.3165317D | 01 |
| ALT 1.4180136D | 08 | LTGD 3.2302880D | 01 | LON 1.1002630D | 02 |
| VE 8.8597415D | 03 | PTE-1.2707170D | 01 | AZE-8.9011274D | 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 10 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.9133009D 05 |
| X- | 4.8057088D 06 | Y | 1.2202659D 08 | Z | 7.7503106D 07 |
| DX- | 4.3537452D 02 | DY- | 1.7700650D 03 | DZ- | 9.3329843D 02 |
| R | 1.4463856D 08 | DEC | 3.2400884D 01 | RA | 9.2255279D 01 |
| V | 2.0478591D 03 | PTH- | 7.5097149D 01 | AZ | 7.3389722D 01 |
| ALT | 1.3826653D 08 | LTGD | 3.2408543D 01 | LON | 1.0292129D 02 |
| VE | 8.6317912D 03 | PTE- | 1.3253722D 01 | AZE- | 8.8971448D 01 |

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|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 10 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.9313009D 05 |
| X- | 5.5883063D 06 | Y | 1.1881405D 08 | Z | 7.5806352D 07 |
| DX- | 4.3412973D 02 | DY- | 1.7996652D 03 | DZ- | 9.5215076D 02 |
| R | 1.4104825D 08 | DEC | 3.2510200D 01 | RA | 9.2692863D 01 |
| V | 2.0817912D 03 | PTH- | 7.4962965D 01 | AZ | 7.3626495D 01 |
| ALT | 1.3467626D 08 | LTGD | 3.2518069D 01 | LON | 9.5838344D 01 |
| VE | 8.4009763D 03 | PTE- | 1.3846161D 01 | AZE- | 8.8928518D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 11 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.9493009D 05 |
| X- | 6.3683887D 06 | Y | 1.1554689D 08 | Z | 7.4074730D 07 |
| DX- | 4.3257289D 02 | DY- | 1.8307789D 03 | DZ- | 9.7205885D 02 |
| R | 1.3739980D 08 | DEC | 3.2623628D 01 | RA | 9.3154671D 01 |
| V | 2.1174912D 03 | PTH- | 7.4819790D 01 | AZ | 7.3876901D 01 |
| ALT | 1.3102784D 08 | LTGD | 3.2631720D 01 | LON | 8.8779618D 01 |
| VE | 8.1672385D 03 | PTE- | 1.4490367D 01 | AZE- | 8.8882127D 01 |

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|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 11 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.9673009D 05 |
| X- | 7.1453533D 06 | Y | 1.1222225D 08 | Z | 7.2306242D 07 |
| DX- | 4.3065684D 02 | DY- | 1.8635515D 03 | DZ- | 9.9313086D 02 |
| R | 1.3369025D 08 | DEC | 3.2741454D 01 | RA | 9.3643182D 01 |
| V | 2.1551331D 03 | PTH- | 7.4666695D 01 | AZ | 7.4142392D 01 |
| ALT | 1.2731833D 08 | LTGD | 3.2749787D 01 | LON | 8.1747597D 01 |
| VE | 7.9305279D 03 | PTE- | 1.5193242D 01 | AZE- | 8.8831865D 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 12 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 4.9853009D 05 |
| X-7.9185044D 06 | | Y 1.0883700D 08 | | Z 7.0498686D 07 | |
| DX-4.2832540D 02 | | DY-1.8981498D 03 | | DZ-1.0154913D 03 | |
| R 1.2991636D 08 | | DEC 3.2863992D 01 | | RA 9.4161253D 01 | |
| V 2.1949164D 03 | | PTH-7.4502607D 01 | | AZ 7.4424644D 01 | |
| ALT 1.2354449D 08 | | LTGD 3.2872584D 01 | | LON 7.4745134D 01 | |
| VE 7.6908070D 03 | | PTE-1.5962939D 01 | | AZE-8.8777256D 01 | |

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|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 12 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.0033009D 05 |
| X-8.6870354D 06 | | Y 1.0538770D 08 | | Z 6.8649614D 07 | |
| DX-4.2551120D 02 | | DY-1.9347653D 03 | | DZ-1.0392845D 03 | |
| R 1.2607459D 08 | | DEC 3.2991585D 01 | | RA 9.4712193D 01 | |
| V 2.2370715D 03 | | PTH-7.4326287D 01 | | AZ 7.4725605D 01 | |
| ALT 1.1970276D 08 | | LTGD 3.3000456D 01 | | LON 6.7775541D 01 | |
| VE 7.4480569D 03 | | PTE-1.6809143D 01 | | AZE-8.8717746D 01 | |

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|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 13 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.0213009D 05 |
| X-9.4500065D 06 | | Y 1.0187051D 08 | | Z 6.6756301D 07 | |
| DX-4.2213284D 02 | | DY-1.9736196D 03 | | DZ-1.0646788D 03 | |
| R 1.2216099D 08 | | DEC 3.3124607D 01 | | RA 9.5299864D 01 | |
| V 2.2818658D 03 | | PTH-7.4136287D 01 | | AZ 7.5047547D 01 | |
| ALT 1.1578920D 08 | | LTGD 3.3133781D 01 | | LON 6.0842679D 01 | |
| VE 7.2022846D 03 | | PTE-1.7743441D 01 | | AZE-8.8652695D 01 | |

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|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 13 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.0393009D 05 |
| X-1.0206316D 07 | | Y 9.8281171D 07 | | Z 6.4815692D 07 | |
| DX-4.1809122D 02 | | DY-2.0149713D 03 | | DZ-1.0918719D 03 | |
| R 1.1817120D 08 | | DEC 3.3263465D 01 | | RA 9.5928802D 01 | |
| V 2.3296124D 03 | | PTH-7.3930907D 01 | | AZ 7.5393149D 01 | |
| ALT 1.1179946D 08 | | LTGD 3.3272969D 01 | | LON 5.3951084D 01 | |
| VE 6.9535349D 03 | | PTE-1.8779793D 01 | | AZE-8.8581350D 01 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | | | | |
|----------------------|------------|---------------|----------------|---------------|----------------|------------|------------|-------------|------------|-----|
| TIME | 6 | APRIL | 1968 | 14 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 5.0573009D | 05 |
| X-1.0954665D | 07 | Y | 9.4614931D | 07 | Z | 6.2824344D | 07 | | | |
| DX-4.1326458D | 02 | DY-2.0591236D | 03 | DZ-1.1210978D | 03 | | | | | |
| R | 1.1410034D | 08 | DEC | 3.3408602D | 01 | RA | 9.6604383D | 01 | | |
| V | 2.3806802D | 03 | PTH-7.3708134D | 01 | AZ | 7.5765591D | 01 | | | |
| ALT | 1.0772865D | 08 | LTGD | 3.3418467D | 01 | LON | 4.7106132D | 01 | | |
| VE | 6.7019061D | 03 | PTE-1.9935137D | 01 | AZE-8.8502831D | 01 | | | | |

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|----------------------|------------|---------------|----------------|---------------|----------------|------------|------------|-------------|------------|-----|
| TIME | 6 | APRIL | 1968 | 14 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 5.0753009D | 05 |
| X-1.1693508D | 07 | Y | 9.0866432D | 07 | Z | 6.0778353D | 07 | | | |
| DX-4.0750184D | 02 | DY-2.1064353D | 03 | DZ-1.1526363D | 03 | | | | | |
| R | 1.0994296D | 08 | DEC | 3.3560494D | 01 | RA | 9.7333026D | 01 | | |
| V | 2.4355077D | 03 | PTH-7.3465564D | 01 | AZ | 7.6168678D | 01 | | | |
| ALT | 1.0357133D | 08 | LTGD | 3.3570755D | 01 | LON | 4.0314242D | 01 | | |
| VE | 6.4475721D | 03 | PTE-2.1230184D | 01 | AZE-8.8416108D | 01 | | | | |

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|----------------------|------------|---------------|----------------|---------------|----------------|------------|------------|-------------|------------|-----|
| TIME | 6 | APRIL | 1968 | 15 | HRS., | 18 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 5.0933009D | 05 |
| X-1.2420997D | 07 | Y | 8.7029613D | 07 | Z | 5.8673265D | 07 | | | |
| DX-4.0061348D | 02 | DY-2.1573347D | 03 | DZ-1.1868246D | 03 | | | | | |
| R | 1.0569289D | 08 | DEC | 3.3719649D | 01 | RA | 9.8122480D | 01 | | |
| V | 2.4946216D | 03 | PTH-7.3200297D | 01 | AZ | 7.6607014D | 01 | | | |
| ALT | 9.9321308D | 07 | LTGD | 3.3730348D | 01 | LON | 3.3583163D | 01 | | |
| VE | 6.1908150D | 03 | PTE-2.2690464D | 01 | AZE-8.8319970D | 01 | | | | |

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|----------------------|------------|---------------|----------------|---------------|----------------|------------|------------|-------------|------------|-----|
| TIME | 6 | APRIL | 1968 | 15 | HRS., | 48 | MIN., | 16.634 | SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | | | | | FLIGHT TIME | 5.1113009D | 05 |
| X-1.3134898D | 07 | Y | 8.3097567D | 07 | Z | 5.6503950D | 07 | | | |
| DX-3.9235892D | 02 | DY-2.2123382D | 03 | DZ-1.2240737D | 03 | | | | | |
| R | 1.0134312D | 08 | DEC | 3.3886596D | 01 | RA | 9.8982193D | 01 | | |
| V | 2.5586602D | 03 | PTH-7.2908795D | 01 | AZ | 7.7086225D | 01 | | | |
| ALT | 9.4971595D | 07 | LTGD | 3.3897780D | 01 | LON | 2.6922343D | 01 | | |
| VE | 5.9320718D | 03 | PTE-2.4347691D | 01 | AZE-8.8213008D | 01 | | | | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|--------------|-----------------|-------------|----------------|-----|
| TIME | 6 APRIL 1968 | 16 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 5.1293009D | 05 |
| X-1.3832485D | 07 | Y 7.9062358D | 07 | Z 5.4264461D | 07 |
| DX-3.8242846D | 02 | DY-2.2720750D | 03 | DZ-1.2648912D | 03 |
| R 9.6885633D | 07 | DEC 3.4061868D | 01 | RA 9.9923830D | 01 |
| V 2.6284075D | 03 | PTH-7.2586692D | 01 | AZ 7.7613270D | 01 |
| ALT 9.0514171D | 07 | LTGD 3.4073597D | 01 | LON 2.0343446D | 01 |
| VE 5.6720028D | 03 | PTE-2.6241581D | 01 | AZE-8.8093596D | 01 |

| | | | | | |
|----------------------|--------------|-----------------|-------------|----------------|-----|
| TIME | 6 APRIL 1968 | 16 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 5.1473009D | 05 |
| X-1.4510395D | 07 | Y 7.4914795D | 07 | Z 5.1947824D | 07 |
| DX-3.7041725D | 02 | DY-2.3373218D | 03 | DZ-1.3099115D | 03 |
| R 9.2311182D | 07 | DEC 3.4245970D | 01 | RA 1.0096199D | 02 |
| V 2.7048383D | 03 | PTH-7.2228521D | 01 | AZ 7.8196878D | 01 |
| ALT 8.5939784D | 07 | LTGD 3.4258312D | 01 | LON 1.9861070D | 01 |
| VE 5.4115935D | 03 | PTE-2.8422220D | 01 | AZE-8.7959903D | 01 |

| | | | | | |
|----------------------|--------------|-----------------|-------------|----------------|-----|
| TIME | 6 APRIL 1968 | 17 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 5.1653009D | 05 |
| X-1.5164419D | 07 | Y 7.0644116D | 07 | Z 4.9545779D | 07 |
| DX-3.5578666D | 02 | DY-2.4090501D | 03 | DZ-1.3599408D | 03 |
| R 8.7608989D | 07 | DEC 3.4439313D | 01 | RA 1.0211522D | 02 |
| V 2.7891837D | 03 | PTH-7.1827334D | 01 | AZ 7.8848165D | 01 |
| ALT 8.1237658D | 07 | LTGD 3.4452352D | 01 | LON 7.4937677D | 00 |
| VE 5.1523073D | 03 | PTE-3.0953164D | 01 | AZE-8.7809982D | 01 |

| | | | | | |
|----------------------|--------------|-----------------|-------------|----------------|-----|
| TIME | 6 APRIL 1968 | 17 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | FLIGHT TIME | 5.1833009D | 05 |
| X-1.5789222D | 07 | Y 6.6237591D | 07 | Z 4.7048413D | 07 |
| DX-3.3780532D | 02 | DY-2.4884954D | 03 | DZ-1.4160215D | 03 |
| R 8.2766365D | 07 | DEC 3.4642101D | 01 | RA 1.0340753D | 02 |
| V 2.8830259D | 03 | PTH-7.1374131D | 01 | AZ 7.9581539D | 01 |
| ALT 7.6395104D | 07 | LTGD 3.4655940D | 01 | LON 1.2655433D | 00 |
| VE 4.8963179D | 03 | PTE-3.3915336D | 01 | AZE-8.7642028D | 01 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 18 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.2013009D 05 |
| X- | 1.6377907D 07 | Y | 6.1679953D 07 | Z | 4.4443654D 07 |
| DX- | 3.1545648D 02 | DY- | 2.5772568D 03 | DZ- | 1.4795296D 03 |
| R | 7.7768187D 07 | DEC | 3.4854114D 01 | RA | 1.0487062D 02 |
| V | 2.9884399D 03 | PTH- | 7.0857013D 01 | AZ | 8.0416052D 01 |
| ALT | 7.1397001D 07 | LTGD | 3.4868883D 01 | LON | 3.5520806D 02 |
| VE | 4.6468658D 03 | PTE- | 3.7411678D 01 | AZE- | 8.7455074D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 18 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.2193009D 05 |
| X- | 1.6921386D 07 | Y | 5.6952623D 07 | Z | 4.1716547D 07 |
| DX- | 2.8728672D 02 | DY- | 2.6774491D 03 | DZ- | 1.5523258D 03 |
| R | 7.2596177D 07 | DEC | 3.5074308D 01 | RA | 1.0654738D 02 |
| V | 3.1082121D 03 | PTH- | 7.0259851D 01 | AZ | 8.1377509D 01 |
| ALT | 6.6225068D 07 | LTGD | 3.5090175D 01 | LON | 3.4936430D 02 |
| VE | 4.4088097D 03 | PTE- | 4.1571977D 01 | AZE- | 8.7250795D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 19 HRS., | 18 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.2373009D 05 |
| X- | 1.7407380D 07 | Y | 5.2032580D 07 | Z | 3.8848177D 07 |
| DX- | 2.5114844D 02 | DY- | 2.7919386D 03 | DZ- | 1.6369991D 03 |
| R | 6.7227875D 07 | DEC | 3.5300037D 01 | RA | 1.0849754D 02 |
| V | 3.2461920D 03 | PTH- | 6.9560123D 01 | AZ | 8.2501832D 01 |
| ALT | 6.0856846D 07 | LTGD | 3.5317219D 01 | LON | 3.4379392D 02 |
| VE | 4.1894801D 03 | PTE- | 4.6556117D 01 | AZE- | 8.7038353D 01 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 19 HRS., | 48 MIN., | 16.634 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.2553009D 05 |
| X- | 1.7818795D 07 | Y | 4.6890700D 07 | Z | 3.5814023D 07 |
| DX- | 2.0373763D 02 | DY- | 2.9247259D 03 | DZ- | 1.7372789D 03 |
| R | 6.1635147D 07 | DEC | 3.5525477D 01 | RA | 1.1080714D 02 |
| V | 3.4078833D 03 | PTH- | 6.8725230D 01 | AZ | 8.3840721D 01 |
| ALT | 5.5264198D 07 | LTGD | 3.5544270D 01 | LON | 3.3858298D 02 |
| VE | 3.9999905D 03 | PTE- | 5.2551566D 01 | AZE- | 8.6848527D 01 |

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TIME 6 APRIL 1968 20 HRS., 18 MIN., 16.634 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.2733009D 05
X-1.8130938D 07 Y 4.1489175D 07 Z 3.2581308D 07
DX-1.3971066D 02 DY-3.0815937D 03 DZ-1.8587702D 03
R 5.5781935D 07 DEC 3.5738269D 01 RA 1.1360552D 02
V 3.6014948D 03 PTH-6.7705824D 01 AZ 8.5471632D 01
ALT 4.9411061D 07 LTGD 3.5759087D 01 LON 3.9386083D 02
VE 3.8572228D 03 PTE-5.9756827D 01 AZE-8.6781299D 01

TIME 6 APRIL 1968 20 HRS., 48 MIN., 16.634 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.2913009D 05
X-1.8306405D 07 Y 3.5777380D 07 Z 2.9104507D 07
DX-4.9856853D 01 DY-3.2712607D 03 DZ-2.0103599D 03
R 4.9620739D 07 DEC 3.5911798D 01 RA 1.1709770D 02
V 3.8399452D 03 PTH-6.6422822D 01 AZ 8.7516509D 01
ALT 4.3249927D 07 LTGD 3.5935249D 01 LON 3.2983248D 02
VE 3.7867915D 03 PTE-6.8338328D 01 AZE-8.7211825D 01

TIME 6 APRIL 1968 21 HRS., 18 MIN., 16.634 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.9093009D 05
X-1.8284904D 07 Y 2.9684837D 07 Z 2.5317131D 07
DX 8.3089069D 01 DY-3.5075573D 03 DZ-2.2071476D 03
R 4.3086940D 07 DEC 3.5985639D 01 RA 1.2163173D 02
V 4.1450407D 03 PTH-6.4739547D 01 AZ 9.0179671D 01
ALT 3.6716155D 07 LTGD 3.6012670D 01 LON 3.2684597D 02
VE 3.8276615D 03 PTE-7.8340633D 01 AZE-9.0279857D 01

TIME 6 APRIL 1968 21 HRS., 48 MIN., 16.634 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.3273009D 05
X-1.7960533D 07 Y 2.3108587D 07 Z 2.1115322D 07
DX 2.9545432D 02 DY-3.8137322D 03 DZ-2.4772753D 03
R 3.6089395D 07 DEC 3.5808913D 01 RA 1.2785518D 02
V 4.5572733D 03 PTH-6.2393775D 01 AZ 9.3831713D 01
ALT 2.9718548D 07 LTGD 3.5841121D 01 LON 3.2554889D 02
VE 4.0409987D 03 PTE-8.7993585D 01 AZE-1.6894193D 02

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | | | |
|----------------------|--------------|----------|------------|--------------|------------|------------|----|
| TIME | 6 APRIL 1968 | 22 HRS., | 30 MIN., | 3.786 SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.35237250 | 05 | |
| X-1.6560936D | 07 | Y | 1.2825946D | 07 | Z | 1.4208313D | 07 |
| DX 9.2303119D | 02 | DY- | 4.4386275D | 03 | DZ- | 3.1019355D | 03 |
| R 2.5310979D | 07 | DEC | 3.4149196D | 01 | RA | 1.4224329D | 02 |
| V 5.4932144D | 03 | PTH- | 5.6759801D | 01 | AZ | 1.0211193D | 02 |
| ALT 1.8939552D | 07 | LTGD | 3.4194167D | 01 | LON | 3.2946194D | 02 |
| VE 4.8491854D | 03 | PTE- | 7.1363145D | 01 | AZE | 1.1391471D | 02 |
| | | | | | | | |
| TIME | 6 APRIL 1968 | 22 HRS., | 31 MIN., | 56.286 SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3534975D | 05 | |
| X-1.6454471D | 07 | Y | 1.2324590D | 07 | Z | 1.3857108D | 07 |
| DX 9.7011978D | 02 | DY- | 4.4744924D | 03 | DZ- | 3.1419688D | 03 |
| R 2.4792430D | 07 | DEC | 3.3981482D | 01 | RA | 1.4316635D | 02 |
| V 5.5528535D | 03 | PTH- | 5.6385322D | 01 | AZ | 1.0262911D | 02 |
| ALT 1.8420945D | 07 | LTGD | 3.4027286D | 01 | LON | 3.2991497D | 02 |
| VE 4.9079156D | 03 | PTE- | 7.0445282D | 01 | AZE | 1.1401020D | 02 |
| | | | | | | | |
| TIME | 6 APRIL 1968 | 22 HRS., | 33 MIN., | 48.786 SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3546225D | 05 | |
| X-1.6342557D | 07 | Y | 1.1819155D | 07 | Z | 1.3501313D | 07 |
| DX 1.0199369D | 03 | DY- | 4.5111586D | 03 | DZ- | 3.1835299D | 03 |
| R 2.4270497D | 07 | DEC | 3.3799265D | 01 | RA | 1.4412504D | 02 |
| V 5.6147739D | 03 | PTH- | 5.5994406D | 01 | AZ | 1.0316383D | 02 |
| ALT 1.7898950D | 07 | LTGD | 3.3845933D | 01 | LON | 3.3040362D | 02 |
| VE 4.9693794D | 03 | PTE- | 6.9514933D | 01 | AZE | 1.1414395D | 02 |
| | | | | | | | |
| TIME | 6 APRIL 1968 | 22 HRS., | 35 MIN., | 41.286 SEC., | GMT | | |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3557475D | 05 | |
| X-1.6224874D | 07 | Y | 1.1309549D | 07 | Z | 1.3140753D | 07 |
| DX 1.0727139D | 03 | DY- | 4.5486319D | 03 | DZ- | 3.2267098D | 03 |
| R 2.3745143D | 07 | DEC | 3.3601131D | 01 | RA | 1.4512156D | 02 |
| V 5.6791218D | 03 | PTH- | 5.5585846D | 01 | AZ | 1.0371691D | 02 |
| ALT 1.7373528D | 07 | LTGD | 3.3648696D | 01 | LON | 3.3093011D | 02 |
| VE 5.0337278D | 03 | PTE- | 6.8571193D | 01 | AZE | 1.1431401D | 02 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|--------------|-----------------|----------|----------------|---------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 37 MIN., | 33.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3568725D 05 |
| X-1.6101075D | 07 | Y 1.0795683D | 07 | Z 1.2775239D | 07 |
| DX 1.1287077D | 03 | DY-4.5869132D | 03 | DZ-3.2716062D | 03 |
| R 2.3216333D | 07 | DEC 3.3385499D | 01 | RA 1.4615836D | 02 |
| V 5.7460561D | 03 | PTH-5.5158313D | 01 | AZ 1.0428922D | 02 |
| ALT 1.6844644D | 07 | LTGD 3.3433993D | 01 | LON 3.3149687D | 02 |
| VE 5.1011245D | 03 | PTE-6.7613029D | 01 | AZE 1.1451887D | 02 |

| | | | | | |
|----------------------|--------------|-----------------|----------|----------------|---------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 39 MIN., | 26.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3579975D 05 |
| X-1.5970783D | 07 | Y 1.0277464D | 07 | Z 1.2404573D | 07 |
| DX 1.1882047D | 03 | DY-4.6259968D | 03 | DZ-3.3183236D | 03 |
| R 2.2684039D | 07 | DEC 3.3150591D | 01 | RA 1.4723804D | 02 |
| V 5.8157501D | 03 | PTH-5.4710337D | 01 | AZ 1.0488167D | 02 |
| ALT 1.6312269D | 07 | LTGD 3.3200047D | 01 | LON 3.3210652D | 02 |
| VE 5.1717472D | 03 | PTE-6.6639269D | 01 | AZE 1.1475737D | 02 |

| | | | | | |
|----------------------|--------------|-----------------|----------|----------------|---------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 41 MIN., | 18.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3591225D 05 |
| X-1.5833586D | 07 | Y 9.7548037D | 06 | Z 1.2028544D | 07 |
| DX 1.2515244D | 03 | DY-4.6658688D | 03 | DZ-3.3669743D | 03 |
| R 2.2148239D | 07 | DEC 3.2894409D | 01 | RA 1.4836347D | 02 |
| V 5.8883921D | 03 | PTH-5.4240289D | 01 | AZ 1.0549518D | 02 |
| ALT 1.5776383D | 07 | LTGD 3.2944862D | 01 | LON 3.3276192D | 02 |
| VE 5.2457892D | 03 | PTE-6.5648583D | 01 | AZE 1.1502869D | 02 |

| | | | | | |
|----------------------|--------------|-----------------|----------|----------------|---------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 43 MIN., | 11.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3602475D 05 |
| X-1.5689034D | 07 | Y 9.2276147D | 06 | Z 1.1646927D | 07 |
| DX 1.3190249D | 03 | DY-4.7065047D | 03 | DZ-3.4176782D | 03 |
| R 2.1608923D | 07 | DEC 3.2614699D | 01 | RA 1.4953778D | 02 |
| V 5.9641879D | 03 | PTH-5.3746362D | 01 | AZ 1.0613074D | 02 |
| ALT 1.5236972D | 07 | LTGD 3.2666182D | 01 | LON 3.3346620D | 02 |
| VE 5.3234610D | 03 | PTE-6.4639463D | 01 | AZE 1.1533223D | 02 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|-------------|----------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 45 MIN., | 3.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3613725D 05 |
| X | -1.5536634D 07 | Y | 8.6958129D 06 | Z | 1.1259484D 07 |
| DX | 1.3911073D 03 | DY | -4.7478666D 03 | DZ | -3.4705635D 03 |
| R | 2.1066090D 07 | DEC | 3.2308911D 01 | RA | 1.5076437D 02 |
| V | 6.0433622D 03 | PTH | -5.3226541D 01 | AZ | 1.0678931D 02 |
| ALT | 1.4694035D 07 | LTGD | 3.2361459D 01 | LON | 3.3422275D 02 |
| VE | 5.4049920D 03 | PTE | -6.3610199D 01 | AZE | 1.1566765D 02 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 46 MIN., | 56.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3624975D 05 |
| X | -1.5375846D 07 | Y | 8.1593196D 06 | Z | 1.0865963D 07 |
| DX | 1.4682233D 03 | DY | -4.7898994D 03 | DZ | -3.5257666D 03 |
| R | 2.0519753D 07 | DEC | 3.1974157D 01 | RA | 1.5204697D 02 |
| V | 6.1261608D 03 | PTH | -5.2678577D 01 | AZ | 1.0747191D 02 |
| ALT | 1.4147587D 07 | LTGD | 3.2027803D 01 | LON | 3.3503531D 02 |
| VE | 5.4906323D 03 | PTE | -6.2558854D 01 | AZE | 1.1603475D 02 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 48 MIN., | 48.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3636225D 05 |
| X | -1.5206076D 07 | Y | 7.6180632D 06 | Z | 1.0466094D 07 |
| DX | 1.5508817D 03 | DY | -4.8325265D 03 | DZ | -3.5834323D 03 |
| R | 1.9969946D 07 | DEC | 3.1607154D 01 | RA | 1.5338967D 02 |
| V | 6.2128523D 03 | PTH | -5.2099950D 01 | AZ | 1.0817953D 02 |
| ALT | 1.3597657D 07 | LTGD | 3.1661929D 01 | LON | 3.3590798D 02 |
| VE | 5.5806554D 03 | PTE | -6.1483227D 01 | AZE | 1.1643348D 02 |

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 22 HRS., | 50 MIN., | 41.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3647475D 05 |
| X | -1.5026668D 07 | Y | 7.0719827D 06 | Z | 1.0059593D 07 |
| DX | 1.6396578D 03 | DY | -4.8756436D 03 | DZ | -3.6437133D 03 |
| R | 1.9416722D 07 | DEC | 3.1204160D 01 | RA | 1.5479697D 02 |
| V | 6.3037310D 03 | PTH | -5.1487833D 01 | AZ | 1.0891314D 02 |
| ALT | 1.3044299D 07 | LTGD | 3.1260092D 01 | LON | 3.3684525D 02 |
| VE | 5.6753596D 03 | PTE | -6.0380817D 01 | AZE | 1.1686391D 02 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 6 APRIL 1968 22 HRS., 52 MIN., 33.786 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3658725D 05
 X-1.4836899D 07 Y 6.5210302D 06 Z 9.6461549D 06
 DX 1.7352032D 03 DY-4.9191113D 03 DZ-3.7067692D 03
 R 1.8860162D 07 DEC 3.0760902D 01 RA 1.5627381D 02
 V 6.3991190D 03 PTH-5.0839037D 01 AZ 1.0967369D 02
 ALT 1.2487593D 07 LTGD 3.0818015D 01 LON 3.3785206D 02
 VE 5.7750712D 03 PTE-5.9248774D 01 AZE 1.1732616D 02

TIME 6 APRIL 1968 22 HRS., 54 MIN., 26.286 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3669975D 05
 X-1.4635966D 07 Y 5.9651763D 06 Z 9.2254595D 06
 DX 1.8382578D 03 DY-4.9627454D 03 DZ-3.7727654D 03
 R 1.8300381D 07 DEC 3.0272486D 01 RA 1.5782567D 02
 V 6.4993686D 03 PTH-5.0149960D 01 AZ 1.1046204D 02
 ALT 1.1927653D 07 LTGD 3.0330795D 01 LON 3.3893389D 02
 VE 5.8801463D 03 PTE-5.8083849D 01 AZE 1.1782036D 02

TIME 6 APRIL 1968 22 HRS., 56 MIN., 18.786 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3681225D 05
 X-1.4422978D 07 Y 5.4044152D 06 Z 8.7971661D 06
 DX 1.9496633D 03 DY-5.0063052D 03 DZ-3.8418705D 03
 R 1.7737534D 07 DEC 2.9733290D 01 RA 1.5945858D 02
 V 6.6048655D 03 PTH-4.9416521D 01 AZ 1.1127892D 02
 ALT 1.1364633D 07 LTGD 2.9792802D 01 LON 3.4009676D 02
 VE 5.9909734D 03 PTE-5.6882325D 01 AZE 1.1834664D 02

TIME 6 APRIL 1968 22 HRS., 58 MIN., 11.286 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3692475D 05
 X-1.4196943D 07 Y 4.8387721D 06 Z 8.3609157D 06
 DX 2.0703795D 03 DY-5.0494767D 03 DZ-3.9142526D 03
 R 1.7171832D 07 DEC 2.9136841D 01 RA 1.6117924D 02
 V 6.7160300D 03 PTH-4.8634078D 01 AZ 1.1212491D 02
 ALT 1.0798740D 07 LTGD 2.9197549D 01 LON 3.4134739D 02
 VE 6.1079756D 03 PTE-5.5639943D 01 AZE 1.1890500D 02

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 0 MIN., | 3.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3703725D 05 |
| X- | 1.3956752D 07 | Y | 4.2683126D 06 | Z | 7.9163303D 06 |
| DX | 2.2015020D 03 | DY- | 5.0918531D 03 | DZ- | 3.9900731D 03 |
| R | 1.6603545D 07 | DEC | 2.8475669D 01 | RA | 1.6299509D 02 |
| V | 6.8333200D 03 | PTH- | 4.7797335D 01 | AZ | 1.1300031D 02 |
| ALT | 1.0230245D 07 | LTGD | 2.8537545D 01 | LON | 3.4269321D 02 |
| VE | 6.2316117D 03 | PTE- | 5.4351810D 01 | AZE | 1.1949528D 02 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 1 MIN., | 56.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3714975D 05 |
| X- | 1.3701168D 07 | Y | 3.6931545D 06 | Z | 7.4630148D 06 |
| DX | 2.3442830D 03 | DY- | 5.1329078D 03 | DZ- | 4.0694787D 03 |
| R | 1.6033028D 07 | DEC | 2.7741132D 01 | RA | 1.6491443D 02 |
| V | 6.9572310D 03 | PTH- | 4.6900236D 01 | AZ | 1.1390507D 02 |
| ALT | 9.6594999D 06 | LTGD | 2.7804126D 01 | LON | 3.4414251D 02 |
| VE | 6.3623775D 03 | PTE- | 5.3012293D 01 | AZE | 1.2011703D 02 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 3 MIN., | 48.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3726225D 05 |
| X- | 1.3428798D 07 | Y | 3.1134832D 06 | Z | 7.0005587D 06 |
| DX | 2.5001543D 03 | DY- | 5.1719608D 03 | DZ- | 4.1525882D 03 |
| R | 1.5460731D 07 | DEC | 2.6923218D 01 | RA | 1.6694653D 02 |
| V | 7.0882960D 03 | PTH- | 4.5935833D 01 | AZ | 1.1483863D 02 |
| ALT | 9.0869550D 06 | LTGD | 2.6987239D 01 | LON | 3.4570458D 02 |
| VE | 6.5008039D 03 | PTE- | 5.1614887D 01 | AZE | 1.2076937D 02 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 5 MIN., | 41.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3737475D 05 |
| X- | 1.3138081D 07 | Y | 2.5295710D 06 | Z | 6.5285407D 06 |
| DX | 2.6707515D 03 | DY- | 5.2081337D 03 | DZ- | 4.2394749D 03 |
| R | 1.4887234D 07 | DEC | 2.6010305D 01 | RA | 1.6910178D 02 |
| V | 7.2270823D 03 | PTH- | 4.4896134D 01 | AZ | 1.1579976D 02 |
| ALT | 8.5131862D 06 | LTGD | 2.6075216D 01 | LON | 3.4738979D 02 |
| VE | 6.6474536D 03 | PTE- | 5.0152069D 01 | AZE | 1.2145085D 02 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TIME 6 APRIL 1968 23 HRS., 7 MIN., 33.786 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3748725D 05
 X-1.2827257D 07 Y 1.9418032D 06 Z 6.0465350D 06
 DX 2.8579392D 03 DY-5.2402926D 03 DZ-4.3301396D 03
 R 1.4313270D 07 DEC 2.4988893D 01 RA 1.7139186D 02
 V 7.3741842D 03 PTH-4.3771930D 01 AZ 1.1678630D 02
 ALT 7.9389263D 06 LTGD 2.5054493D 01 LON 3.4920984D 02
 VE 6.8029128D 03 PTE-4.8615121D 01 AZE 1.2215913D 02

TIME 6 APRIL 1968 23 HRS., 9 MIN., 26.286 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3759975D 05
 X-1.2494344D 07 Y 1.3507101D 06 Z 5.5541215D 06
 DX 3.0638342D 03 DY-5.2669735D 03 DZ-4.4244737D 03
 R 1.3739771D 07 DEC 2.3843311D 01 RA 1.7382995D 02
 V 7.5302096D 03 PTH-4.2552587D 01 AZ 1.1779483D 02
 ALT 7.3651049D 06 LTGD 2.3909308D 01 LON 3.5117790D 02
 VE 6.9677767D 03 PTE-4.6993926D 01 AZE 1.2289075D 02

TIME 6 APRIL 1968 23 HRS., 11 MIN., 18.786 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3771225D 05
 X-1.2137104D 07 Y 7.5700978D 05 Z 5.0509007D 06
 DX 3.2908215D 03 DY-5.2862863D 03 DZ-4.5222056D 03
 R 1.3167914D 07 DEC 2.2555387D 01 RA 1.7643099D 02
 V 7.6957568D 03 PTH-4.1225830D 01 AZ 1.1882026D 02
 ALT 6.7928998D 06 LTGD 2.2621373D 01 LON 3.5330890D 02
 VE 7.1426245D 03 PTE-4.5276742D 01 AZE 1.2364067D 02

TIME 6 APRIL 1968 23 HRS., 13 MIN., 11.286 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3782475D 05
 X-1.1753018D 07 Y 1.6166251D 05 Z 4.5365165D 06
 DX 3.5415571D 03 DY-5.2957934D 03 DZ-4.6228257D 03
 R 1.2599189D 07 DEC 2.1104136D 01 RA 1.7921194D 02
 V 7.8713768D 03 PTH-3.9777492D 01 AZ 1.1985524D 02
 ALT 6.2238010D 06 LTGD 2.1169544D 01 LON 3.5561982D 02
 VE 7.3279795D 03 PTE-4.3449952D 01 AZE 1.2440170D 02

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TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

| | | | | | |
|----------------------|--------------|-----------------|----------|---------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 15 MIN., | 3.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3793725D 05 |
| X-1.1339254D | 07 | Y-4.3405943D | 05 | Z | 4.0106880D 06 |
| DX 3.8189424D | 03 | DY-5.2923561D | 03 | DZ-4.7254821D | 03 |
| R 1.2035477D | 07 | DEC 1.9465474D | 01 | RA-1.7780781D | 02 |
| V 8.0575141D | 03 | PTH-3.8191281D | 01 | AZ | 1.2088943D 02 |
| ALT 5.6596917D | 06 | LTGD 1.9529530D | 01 | LON | 3.5813000D 02 |
| VE 7.5242475D | 03 | PTE-4.1497816D | 01 | AZE | 1.2516381D 02 |

| | | | | | |
|----------------------|--------------|-----------------|----------|---------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 16 MIN., | 56.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3804975D 05 |
| X-1.0892642D | 07 | Y-1.0284826D | 06 | Z | 3.4732560D 06 |
| DX 4.1260502D | 03 | DY-5.2719486D | 03 | DZ-4.8288363D | 03 |
| R 1.1479152D | 07 | DEC 1.7612075D | 01 | RA-1.7460612D | 02 |
| V 8.2544165D | 03 | PTH-3.6448565D | 01 | AZ | 1.2190847D 02 |
| ALT 5.1029490D | 06 | LTGD 1.7673733D | 01 | LON | 8.6169800D-01 |
| VE 7.7316224D | 03 | PTE-3.9402242D | 01 | AZE | 1.2591309D 02 |

| | | | | | |
|----------------------|--------------|-----------------|----------|---------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 18 MIN., | 48.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3816225D 05 |
| X-1.0409662D | 07 | Y-1.6194208D | 06 | Z | 2.9242481D 06 |
| DX 4.4659695D | 03 | DY-5.2294428D | 03 | DZ-4.9308712D | 03 |
| R 1.0933198D | 07 | DEC 1.5513476D | 01 | RA-1.7115742D | 02 |
| V 8.4620001D | 03 | PTH-3.4528263D | 01 | AZ | 1.2289275D 02 |
| ALT 4.5565668D | 06 | LTGD 1.5571342D | 01 | LON | 3.8403585D 00 |
| VE 7.9499464D | 03 | PTE-3.7142655D | 01 | AZE | 1.2663054D 02 |

| | | | | | |
|----------------------|--------------|-----------------|----------|---------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 20 MIN., | 41.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3827475D 05 |
| X-9.8864617D | 06 | Y-2.2040383D | 06 | Z | 2.3639684D 06 |
| DX 4.8415191D | 03 | DY-5.1583797D | 03 | DZ-5.0286397D | 03 |
| R 1.0401358D | 07 | DEC 1.3136690D | 01 | RA-1.6743227D | 02 |
| V 8.6796547D | 03 | PTH-3.2406931D | 01 | AZ | 1.2381568D 02 |
| ALT 4.0243013D | 06 | LTGD 1.3188940D | 01 | LON | 7.0954766D 00 |
| VE 8.1785102D | 03 | PTE-3.4696052D | 01 | AZE | 1.2729036D 02 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - FIRST OPPORTUNITY (CONTINUED)

| | | | | | |
|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 22 MIN., | 33.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3838725D 05 |
| X-9.3189051D 06 | | Y-2.7786879D 06 | | Z | 1.7931190D 06 |
| DX 5.2547646D 03 | | DY-5.0507720D 03 | | DZ-5.1179594D 03 | |
| R 9.8882949D 06 | | DEC 1.0447677D 01 | | RA-1.6339659D 02 | |
| V 8.9059731D 03 | | PTH-3.0059215D 01 | | AZ 1.2464168D 02 | |
| ALT 3.5108357D 06 | | LTGD 1.0491974D 01 | | LON 1.0661121D 01 | |
| VE 8.4157735D 03 | | PTE-3.2037427D 01 | | AZE 1.2785790D 02 | |

| | | | | | |
|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 24 MIN., | 26.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3849975D 05 |
| X-8.7027021D 06 | | Y-3.3387335D 06 | | Z | 1.2129579D 06 |
| DX 5.7062577D 03 | | DY-4.8970240D 03 | | DZ-5.1930739D 03 | |
| R 9.3997571D 06 | | DEC 7.4142022D 00 | | RA-1.5901101D 02 | |
| V 9.1383936D 03 | | PTH-2.7458938D 01 | | AZ 1.2532371D 02 | |
| ALT 3.0219501D 06 | | LTGD 7.4476500D 00 | | LON 1.4576668D 01 | |
| VE 8.6590006D 03 | | PTE-2.9140812D 01 | | AZE 1.2828716D 02 | |

| | | | | | |
|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 26 MIN., | 18.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3861225D 05 |
| X-8.0336354D 06 | | Y-3.8783762D 06 | | Z | 6.2549368D 05 |
| DX 6.1939288D 03 | | DY-4.6861261D 03 | | DZ-5.2463537D 03 | |
| R 8.9427257D 06 | | DEC 4.0107942D 00 | | RA-1.5423026D 02 | |
| V 9.3727669D 03 | | PTH-2.4581136D 01 | | AZ 1.2580053D 02 | |
| ALT 2.5646665D 06 | | LTGD 4.0299698D 00 | | LON 1.8887386D 01 | |
| VE 8.9038183D 03 | | PTE-2.5981303D 01 | | AZE 1.2851796D 02 | |

| | | | | | |
|----------------------|--------------|--------------------|----------|-------------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 28 MIN., | 11.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3872475D 05 |
| X-7.3079347D 06 | | Y-4.3905285D 06 | | Z | 3.3705490D 04 |
| DX 6.7116347D 03 | | DY-4.4063600D 03 | | DZ-5.2681841D 03 | |
| R 8.5254787D 06 | | DEC 2.2651951D-01 | | RA-1.4900300D 02 | |
| V 9.6029064D 03 | | PTH-2.1405465D 01 | | AZ 1.2599422D 02 | |
| ALT 2.1473149D 06 | | LTGD 2.2765951D-01 | | LON 2.3644619D 01 | |
| VE 9.1437602D 03 | | PTE-2.2538457D 01 | | AZE 1.2847334D 02 | |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|---------------|----------|---------------|-------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 30 MIN., | 3.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3883725D 05 |
| X | 6.5228261D 06 | Y | 4.8668110D 06 | Z | 5.5824636D 05 |
| DX | 7.2475439D 03 | DY | 4.0468023D 03 | DZ | 5.2472876D 03 |
| R | 8.1574965D 06 | DEC | 3.9240196D 00 | RA | 1.4327264D 02 |
| V | 9.8202612D 03 | PTH | 1.7921206D 01 | AZ | 1.2580887D 02 |
| ALT | 1.7794329D 06 | LTGD | 3.9445986D 00 | LON | 2.8904946D 01 |
| VE | 9.3699398D 03 | PTE | 1.8801336D 01 | AZE | 1.2805803D 02 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 31 MIN., | 56.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3894975D 05 |
| X | 5.6772500D 06 | Y | 5.2977726D 06 | Z | 1.1448855D 06 |
| DX | 7.7828745D 03 | DY | 3.5998265D 03 | DZ | 5.1718033D 03 |
| R | 7.8490971D 06 | DEC | 8.3872019D 00 | RA | 1.3698029D 02 |
| V | 1.0013962D 04 | PTH | 1.4133721D 01 | AZ | 1.2513221D 02 |
| ALT | 1.4713896D 06 | LTGD | 8.4324101D 00 | LON | 3.4727260D 01 |
| VE | 9.5711084D 03 | PTE | 1.4774974D 01 | AZE | 1.2715977D 02 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 33 MIN., | 48.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3906225D 05 |
| X | 4.7726600D 06 | Y | 5.6734434D 06 | Z | 1.7194604D 06 |
| DX | 8.2918889D 03 | DY | 3.0644236D 03 | DZ | 5.0313525D 03 |
| R | 7.6107021D 06 | DEC | 1.3057373D 01 | RA | 1.3007148D 02 |
| V | 1.0171559D 04 | PTH | 1.0071213D 01 | AZ | 1.2384280D 02 |
| ALT | 1.2336336D 06 | LTGD | 1.3128478D 01 | LON | 4.1166033D 01 |
| VE | 9.7344210D 03 | PTE | 1.0487078D 01 | AZE | 1.2565633D 02 |

| | | | | | |
|----------------------|---------------|----------|---------------|--------------|---------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 35 MIN., | 41.286 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3917475D 05 |
| X | 3.8137020D 06 | Y | 5.9842690D 06 | Z | 2.2742691D 06 |
| DX | 8.7441874D 03 | DY | 2.4494426D 03 | DZ | 4.8189289D 03 |
| R | 7.4517178D 06 | DEC | 1.7770234D 01 | RA | 1.2250886D 02 |
| V | 1.0280676D 04 | PTH | 5.7894718D 00 | AZ | 1.2182607D 02 |
| ALT | 1.0755527D 06 | LTGD | 1.7866115D 01 | LON | 4.8258622D 01 |
| VE | 9.8471373D 03 | PTE | 5.9924758D 00 | AZE | 1.2343135D 02 |

TABLE 10- LXXXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

| | | | | | |
|----------------------|----------------|----------|----------------|--------------|----------------|
| TIME | 6 APRIL 1968 | 23 HRS., | 37 MIN., | 33.786 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3928725D 05 |
| X | -2.8084805D 06 | Y | -6.2223297D 06 | Z | -2.8013173D 06 |
| DX | 9.1097156D 03 | DY | -1.7751094D 03 | DZ | -4.5387456D 03 |
| R | 7.3791821D 06 | DEC | -2.2310415D 01 | RA | -1.1429227D 02 |
| V | 1.0331415D 04 | PTH | -1.3714557D 00 | AZ | 1.1900087D 02 |
| ALT | 1.0041103D 06 | LTGD | -2.2427371D 01 | LON | 5.6005174D 01 |
| VE | 9.8990916D 03 | PTE | -1.3721807D 00 | AZE | 1.2040086D 02 |

| | | | | | |
|----------------------------|----------------|----------|----------------|-------------|----------------|
| FREE-RETURN VACUUM PERIGEE | | | | | |
| TIME | 6 APRIL 1968 | 23 HRS., | 38 MIN., | 6.959 SEC., | GMT |
| GEOCENTRIC REFERENCE | | | | FLIGHT TIME | 5.3932042D 05 |
| X | -2.5048040D 06 | Y | -6.2778048D 06 | Z | -2.9503194D 06 |
| DX | 9.1972722D 03 | DY | -1.5691195D 03 | DZ | -4.4437335D 03 |
| R | 7.3749075D 06 | DEC | -2.3581198D 01 | RA | -1.1175168D 02 |
| V | 1.0334347D 04 | PTH | -5.7363717D-02 | AZ | 1.1800916D 02 |
| ALT | 1.0001772D 06 | LTGD | -2.3703349D 01 | LON | 5.8407172D 01 |
| VE | 9.9019037D 03 | PTE | -1.1801096D-13 | AZE | 1.1934865D 02 |

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TABLE 10-LXXXII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 19 HRS., 51 MIN., 30.750 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.179000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -6.547033E 06 | YYY | -1.819294E 04 | ZZZ | 5.728163E 05 |
| DXX | -6.828665E 02 | DYY | -1.033035E 02 | DZZ | -7.760954E 03 |
| R | 6.572069E 06 | WT | 2.987048E 05 | F | 1.827262E 01 |
| V | 7.791623E 03 | PTH | 3.024160E-02 | AZ | 1.008589E 02 |
| ALT | 1.984973E 05 | LAT | -2.755671E 01 | LON | 5.967919E 01 |
| VE | 7.374791E 03 | PTE | 3.195100E-02 | AZE | 1.014808E 02 |
| ANG | 3.921264E 00 | NFA | 9.892298E 01 | IAC | 9.233731E 00 |
| CPA | 9.115804E 01 | VPA | 9.115804E 01 | CYA | -7.472551E-01 |
| VYA | -7.472551E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.639000E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -5.896814E 06 | YYY | -6.197980E 04 | ZZZ | -2.906072E 06 |
| DXX | 3.441960E 03 | DYY | -8.244363E 01 | DZZ | -6.994147E 03 |
| R | 6.574307E 06 | WT | 2.975703E 05 | F | 2.073030E 05 |
| V | 7.795638E 03 | PTH | 3.801602E-02 | AZ | 8.359871E 01 |
| ALT | 2.011274E 05 | LAT | -2.881677E 01 | LON | 9.330030E 01 |
| VE | 7.378366E 03 | PTE | 4.016570E-02 | AZE | 8.323505E 01 |
| ANG | 3.889172E 00 | NFA | 8.405110E 01 | IAC | 1.184875E 01 |
| CPA | 5.992726E 01 | VPA | 5.992726E 01 | CYA | -5.681360E-01 |
| VYA | -5.681360E-01 | CRA | -0.000000E-39 | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 8.974567E 03 | |
|----------------------|---------------|-------------|---------------|--------------|---------------|
| XXX | -4.056415E 06 | YYY | -7.442786E 04 | ZZZ | -5.335643E 06 |
| DXX | 7.753389E 03 | DYY | 1.120377E 02 | DZZ | -7.577156E 03 |
| R | 6.702919E 06 | WT | 1.398039E 05 | F | 2.060472E 05 |
| V | 1.084163E 04 | PTH | 7.090077E 00 | AZ | 7.179459E 01 |
| ALT | 3.280103E 05 | LAT | -2.292104E 01 | LON | 1.207148E 02 |
| VE | 1.041832E 04 | PTE | 7.379723E 00 | AZE | 7.101459E 01 |
| ANG | 6.939849E 00 | NFA | 1.551299E 01 | IAC | 1.623453E 01 |
| CPA | 4.277106E 01 | VPA | 4.277010E 01 | CYA | 6.504043E 00 |
| VYA | 6.504258E 00 | CRA | -0.000000E-39 | VRA | 0.000000E-39 |

TABLE 10- LXXXII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 31 MARCH 1968 22 HRS., 21 MIN., 5.317 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 8.9745671D 03

| | | |
|-------------------|--------------------|-------------------|
| X 1.6323382D 06 | Y-5.9538727D 06 | Z-2.6107471D 06 |
| DX 1.0528473D 04 | DY 2.5099714D 02 | DZ 2.5747128D 03 |
| R 6.7029194D 06 | DEC-2.2923019D 01 | RA-7.4668280D 01 |
| V 1.0841627D 04 | PTH 7.0900770D 00 | AZ 7.1794104D 01 |
| ALT 3.2801203D 05 | LTGD-2.3054580D 01 | LCN 1.2071388D 02 |
| VE 1.0418332D 04 | PTE 7.3368586D 00 | AZE 7.0998035D 01 |

PERISELENUM
TIME 4 APRIL 1968 0 HRS., 58 MIN., 59.069 SEC.,GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC 2.9435635D 05 | YSC 1.6922220D 06 | ZSC 7.4757127D 05 |
| DXSC 2.4900268D 03 | DYSC-3.3893242D 02 | DZSC-2.1323227D 02 |
| RSC 1.8732655D 06 | DESC 2.3520292D 01 | RASC 8.0132319D 01 |
| VSC 2.5220183D 03 | PTSC-7.569505D-13 | AZSC-9.5290703D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8673344D 06 | YSG 1.3733732D 05 | ZSG 5.7655680D 04 |
| DXSG 1.8236230D 02 | DYSG 2.5186836D 03 | DZSG-9.3275573D 01 |
| HSG 1.3517601D 05 | LTSG 1.7637376D 00 | LNSG 1.7579362D 02 |
| VRSG 2.5269989D 03 | PTSG 2.0021018D-08 | AZSG-9.2116357D 01 |
| LTS-1.4822365D-01 | LNS 1.0904135D 02 | LTE-6.0603215D 00 |
| LNE-4.3284909D 00 | DSMP 4.0380563D-01 | RSMP 1.1321505D 02 |
| LIN 1.7724210D 02 | LAN-4.3940561D 01 | LAP 1.4023276D 02 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7764832D 05

| | | |
|-------------------|--------------------|-------------------|
| X 6.3926673D 07 | Y 3.5277437D 08 | Z 1.8889227D 08 |
| DX 1.5285682D 03 | DY-2.4065619D 02 | DZ-1.2759617D 02 |
| R 4.0523656D 08 | DEC 2.7783273D 01 | RA 7.9728816D 01 |
| V 1.5526483D 03 | PTH-1.0275153D 00 | AZ-9.4787093D 01 |
| ALT 3.9886303D 08 | LTGD 2.7785765D 01 | LCN 2.3257207D 02 |
| VE 2.7690970D 04 | PTE-5.7621942D-02 | AZE-9.0268054D 01 |

FREE-RETURN VACUUM PERIGEE
TIME 7 APRIL 1968 1 HRS., 33 MIN., 9.919 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.3889917D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.2591590D 06 | Y-6.1450963D 06 | Z-2.7868090D 06 |
| DX 9.0155018D 03 | DY-8.7094817D 02 | DZ-5.3557099D 03 |
| R 7.1156386D 06 | DEC-2.3056935D 01 | RA-1.1018524D 02 |
| V 1.0522426D 04 | PTH-6.8909963D-02 | AZ 1.2361999D 02 |
| ALT 7.4076622D 05 | LTGD-2.3181393D 01 | LCN 3.1132529D 01 |
| VE 1.0128307D 04 | PTE-1.6541554D-13 | AZE 1.2511562D 02 |

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TABLE 10-LXXXIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 21 HRS., 41 MIN., 41.280 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -5.763204E 06 | YYY 1.055231E 03 | ZZZ 3.152004E 06 | 7.828000E 03 |
| DXX -3.742440E 03 | DYY -4.306422E 01 | DZZ -6.837845E 03 | |
| R 6.568840E 06 | WT 2.992489E 05 | F 1.958566E 01 | |
| V 7.795116E 03 | PTH 1.732631E-02 | AZ 1.043505E 02 | |
| ALT 1.944658E 05 | LAT -2.484954E 01 | LON 3.476540E 01 | |
| VE 7.374807E 03 | PTE 1.831399E-02 | AZE 1.051875E 02 | |
| ANG 3.960321E 00 | NFA 1.021987E 02 | IAC 9.244411E 00 | |
| CPA 1.148224E 02 | VPA 1.148224E 02 | CYA -3.164392E-01 | |
| VYA -3.164392E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -6.563790E 06 | YYY -1.909679E 04 | ZZZ -2.972678E 05 | 8.288000E 03 |
| DXX 3.482810E 02 | DYY -4.251093E 01 | DZZ -7.791479E 03 | |
| R 6.570545E 06 | WT 2.981131E 05 | F 2.073030E 05 | |
| V 7.799375E 03 | PTH 3.457526E-02 | AZ 8.827650E 01 | |
| ALT 1.972382E 05 | LAT -2.840995E 01 | LON 6.771642E 01 | |
| VE 7.378149E 03 | PTE 3.654907E-02 | AZE 8.817807E 01 | |
| ANG 3.873235E 00 | NFA 8.835568E 01 | IAC 1.184954E 01 | |
| CPA 8.357053E 01 | VPA 8.357053E 01 | CYA -3.003576E-01 | |
| VYA -3.003576E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -5.844970E 06 | YYY -2.537889E 04 | ZZZ -3.270914E 06 | 8.624826E 03 |
| DXX 4.095364E 03 | DYY 6.841659E 01 | DZZ -1.004271E 04 | |
| R 6.698000E 06 | WT 1.402261E 05 | F 2.060472E 05 | |
| V 1.084587E 04 | PTH 7.044951E 00 | AZ 7.550221E 01 | |
| ALT 3.235228E 05 | LAT -2.448870E 01 | LON 9.581414E 01 | |
| VE 1.041951E 04 | PTE 7.334778E 00 | AZE 7.488526E 01 | |
| ANG 4.665177E 00 | NFA 2.556074E 01 | IAC 1.622046E 01 | |
| CPA 6.609184E 01 | VPA 6.609098E 01 | CYA 3.958249E 00 | |
| VYA 3.958352E 00 | CRA -0.000000E-39 | VRA 0.000000E-39 | |

TABLE 10-LXXXIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 1 APRIL 1968 0 HRS., 5 MIN., 26.106 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 8.6248260D 03

| | | |
|-------------------|--------------------|-------------------|
| X 1.7402693D 06 | Y-5.8416638D 06 | Z-2.7766218D 06 |
| DX 1.0651997D 04 | DY 7.4455636D 02 | DZ 1.9008918D 03 |
| R 6.6979998D 06 | DEC-2.4490660D 01 | RA-7.3410862D 01 |
| V 1.0845865D 04 | PTH 7.0449506D 00 | AZ 7.5501666D 01 |
| ALT 3.2352450D 05 | LTGD-2.4629085D 01 | LGN 9.5813259D 01 |
| VE 1.0419515D 04 | PTE 7.2986562D 00 | AZE 7.4867549D 01 |

PERISELENUM
TIME 4 APRIL 1968 2 HRS., 25 MIN., 2.022 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC 2.6026754D 05 | YSC 1.6878759D 06 | ZSC 7.5430997D 05 |
| DXSC 2.5017668D 03 | DYSC-3.1482769D 02 | DZSC-1.5873925D 02 |
| RSC 1.8669890D 06 | DESC 2.3830033D 01 | RASC 8.1234126D 01 |
| VSC 2.5264900D 03 | PTSC-3.0287924D-13 | AZSC-9.3938487D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8613520D 06 | YSG 1.2916222D 05 | ZSG 6.5830188D 04 |
| DXSG 1.7337767D 02 | DYSG 2.5249784D 03 | DZSG-5.1875212D 01 |
| HSG 1.2889948D 05 | LTSG 2.0206727D 00 | LNSG 1.7603051D 02 |
| VRSG 2.5314555D 03 | PTSG 1.3085222D-08 | AZSG-9.1174927D 01 |
| LTS-1.4705791D-01 | LNS 1.0831216D 02 | LTE-6.0995349D 00 |
| LNE-4.4015029D 00 | DSMP 3.9841199D-01 | RSMP 1.1256153D 02 |
| LIN 1.7766153D 02 | LAN-6.3736159D 01 | LAP 1.2021251D 02 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7620074D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.8923748D 07 | Y 3.5324850D 08 | Z 1.8932564D 08 |
| DX 1.5384474D 03 | DY-2.2775911D 02 | DZ-7.9114308D 01 |
| R 4.0509346D 08 | DEC 2.7863248D 01 | RA 8.0529941D 01 |
| V 1.5572263D 03 | PTH-4.3441620D-01 | AZ-9.3064510D 01 |
| ALT 3.9871996D 08 | LTGD 2.7865745D 01 | LGN 2.1180199D 02 |
| VE 2.7670275D 04 | PTE-2.4455331D-02 | AZE-9.0172372D 01 |

FREE-RETURN VACUUM PERIGEE
TIME 7 APRIL 1968 3 HRS., 4 MIN., 17.825 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.3775654D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.1112790D 06 | Y-6.1123340D 06 | Z-2.7257748D 06 |
| DX 8.8700401D 03 | DY-4.7153392D 02 | DZ-5.7776616D 03 |
| R 7.0176900D 06 | DEC-2.2855899D 01 | RA-1.0905557D 02 |
| V 1.0596288D 04 | PTH-7.4239545D-02 | AZ 1.2631743D 02 |
| ALT 6.4276388D 05 | LTGD-2.2981249D 01 | LGN 9.4168910D 00 |
| VE 1.0220148D 04 | PTE 1.6561670D-12 | AZE 1.2788341D 02 |

TABLE 10-LXXXIV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 22 HRS., 10 MIN., 41.580 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.410404E 06 | YYY | -1.686529E 04 |
| DXX | -4.420187E 03 | DYY | 1.394018E 01 |
| R | 6.567233E 06 | WT | 2.989075E 05 |
| V | 7.795949E 03 | PTH | 1.223240E-02 |
| ALT | 1.938110E 05 | LAT | -2.804024E 01 |
| VE | 7.380655E 03 | PTE | 1.292090E-02 |
| ANG | 3.915966E 00 | NFA | 9.859315E 01 |
| CPA | 1.206703E 02 | VPA | 1.206703E 02 |
| VYA | 1.121512E-01 | CRA | -0.000000E-39 |
| | | ZZZ | 3.722337E 06 |
| | | DZZ | -6.421727E 03 |
| | | F | 1.987944E 01 |
| | | AZ | 1.004315E 02 |
| | | LON | 2.765309E 01 |
| | | AZE | 1.010257E 02 |
| | | IAC | 9.247048E 00 |
| | | CYA | 1.121512E-01 |
| | | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.558238E 06 | YYY | -9.554107E 03 |
| DXX | -4.464975E 02 | DYY | 1.704175E 01 |
| R | 6.568787E 06 | WT | 2.977715E 05 |
| V | 7.800826E 03 | PTH | 3.462311E-02 |
| ALT | 1.956605E 05 | LAT | -2.898418E 01 |
| VE | 7.385209E 03 | PTE | 3.657156E-02 |
| ANG | 3.892701E 00 | NFA | 8.399713E 01 |
| CPA | 8.941125E 01 | VPA | 8.941125E 01 |
| VYA | 1.305130E-01 | CRA | -0.000000E-39 |
| | | ZZZ | 3.719956E 05 |
| | | DZZ | -7.788018E 03 |
| | | F | 2.073030E 05 |
| | | AZ | 8.290121E 01 |
| | | LON | 6.145042E 01 |
| | | AZE | 8.249947E 01 |
| | | IAC | 1.185886E 01 |
| | | CYA | 1.305130E-01 |
| | | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.147741E 06 | YYY | 1.195766E 04 |
| DXX | 3.036031E 03 | DYY | 2.168037E 02 |
| R | 6.699549E 06 | WT | 1.399227E 05 |
| V | 1.084430E 04 | PTH | 7.156145E 00 |
| ALT | 3.245878E 05 | LAT | -2.272760E 01 |
| VE | 1.042250E 04 | PTE | 7.447361E 00 |
| ANG | 7.057538E 00 | NFA | 1.630963E 01 |
| CPA | 7.205316E 01 | VPA | 7.205248E 01 |
| VYA | 7.118749E 00 | CRA | -0.000000E-39 |
| | | ZZZ | -2.662535E 06 |
| | | DZZ | -1.040838E 04 |
| | | F | 2.060472E 05 |
| | | AZ | 7.108520E 01 |
| | | LON | 8.892899E 01 |
| | | AZE | 7.027536E 01 |
| | | IAC | 1.622542E 01 |
| | | CYA | 7.118670E 00 |
| | | VRA | 0.000000E-39 |

TABLE 10- LXXXIV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
 OF 99 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION
 TIME 1 APRIL 1968 0 HRS., 32 MIN., 59.702 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 8.5381218D 03

| | | |
|-------------------|--------------------|-------------------|
| X 1.7666656D 06 | Y-5.9213236D 06 | Z-2.5885849D 06 |
| DX 1.0495451D 04 | DY 4.2469580D 02 | DZ 2.6951656D 03 |
| R 6.6995487D 06 | DEC-2.2729561D 01 | RA-7.3387180D 01 |
| V 1.0844297D 04 | PTH 7.1561463D 00 | AZ 7.1084662D 01 |
| ALT 3.2458953D 05 | LTGD-2.2860326D 01 | LON 8.8928096D 01 |
| VE 1.0422511D 04 | PTE 7.4032046D 00 | AZE 7.0258766D 01 |

PERISELENUM
 TIME 4 APRIL 1968 3 HRS., 11 MIN., 4.202 SEC., GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC 2.5690605D 05 | YSC 1.7101110D 06 | ZSC 7.5753938D 05 |
| DXSC 2.4900860D 03 | DYSC-2.9020709D 02 | DZSC-1.8933907D 02 |
| RSC 1.8879476D 06 | DESC 2.3656357D 01 | RASC 8.1456471D 01 |
| VSC 2.5140799D 03 | PTSC-6.8149897D-14 | AZSC-9.4716212D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8819200D 06 | YSG 1.3805378D 05 | ZSG 6.0534844D 04 |
| DXSG 1.8132546D 02 | DYSG 2.5109754D 03 | DZSG-8.9363990D 01 |
| HSG 1.4985816D 05 | LTSG 1.8374373D 00 | LNSG 1.7580441D 02 |
| VRSG 2.5190995D 03 | PTSG 8.5749008D-09 | AZSG-9.2034011D 01 |
| LTS-1.4643316D-01 | LNS 1.0792204D 02 | LTE-6.1201381D 00 |
| LNE-4.4403466D 00 | DSMP 3.9552583D-01 | RSMP 1.1221173D 02 |
| LIN 1.7725619D 02 | LAN-4.6215302D 01 | LAP 1.3794759D 02 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7722262D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.6258227D 07 | Y 3.5350294D 08 | Z 1.8954435D 08 |
| DX 1.5258345D 03 | DY-2.0914556D 02 | DZ-1.1293818D 02 |
| R 4.0503874D 08 | DEC 2.7902343D 01 | RA 8.0957490D 01 |
| V 1.5442369D 03 | PTH-8.7023238D-01 | AZ-9.4285256D 01 |
| ALT 3.9866525D 08 | LTGD 2.7904843D 01 | LON 2.0068895D 02 |
| VE 2.7642232D 04 | PTE-4.8624215D-02 | AZE-9.0239140D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 7 APRIL 1968 3 HRS., 45 MIN., 4.228 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.3846265D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.0290048D 06 | Y-5.9488358D 06 | Z-2.7127409D 06 |
| DX 9.2540497D 03 | DY-6.8393953D 02 | DZ-5.3879778D 03 |
| R 6.8457630D 06 | DEC-2.3344933D 01 | RA-1.0883327D 02 |
| V 1.0730122D 04 | PTH-7.1510508D-02 | AZ 1.2319203D 02 |
| ALT 4.7096941D 05 | LTGD-2.3475559D 01 | LON 3.5941790D 02 |
| VE 1.0349612D 04 | PTE 2.9899859D-12 | AZE 1.2458131D 02 |

TABLE 10-LXXXV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 22 HRS., 16 MIN., 13.130 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.375691E 06 | YYY | -3.781996E 04 |
| DXX | -4.478260E 03 | DYY | 6.958690E 01 |
| R | 6.566347E 06 | WT | 2.977280E 05 |
| V | 7.795713E 03 | PTH | 1.342583E-02 |
| ALT | 1.945072E 05 | LAT | -3.288617E 01 |
| VE | 7.394715E 03 | PTE | 1.415432E-02 |
| ANG | 3.877208E 00 | NFA | 9.301751E 01 |
| CPA | 1.211927E 02 | VPA | 1.211927E 02 |
| VYA | 5.325635E-01 | CRA | -0.000000E-39 |
| | | ZZZ | 3.770601E 06 |
| | | DZZ | -6.380712E 03 |
| | | F | 1.990993E 01 |
| | | AZ | 9.412032E 01 |
| | | LON | 2.635510E 01 |
| | | AZE | 9.434417E 01 |
| | | IAC | 9.246400E 00 |
| | | CYA | 5.325635E-01 |
| | | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.553925E 06 | YYY | -3.203790E 03 |
| DXX | -5.171496E 02 | DYY | 7.731725E 01 |
| R | 6.568081E 06 | WT | 2.965919E 05 |
| V | 7.801161E 03 | PTH | 3.853561E-02 |
| ALT | 1.951782E 05 | LAT | -2.968183E 01 |
| VE | 7.400857E 03 | PTE | 4.062002E-02 |
| ANG | 3.965553E 00 | NFA | 7.752633E 01 |
| CPA | 8.993100E 01 | VPA | 8.993100E 01 |
| VYA | 5.684843E-01 | CRA | -0.000000E-39 |
| | | ZZZ | 4.309886E 05 |
| | | DZZ | -7.783616E 03 |
| | | F | 2.073030E 05 |
| | | AZ | 7.458057E 01 |
| | | LON | 6.103152E 01 |
| | | AZE | 7.372402E 01 |
| | | IAC | 1.187786E 01 |
| | | CYA | 5.684843E-01 |
| | | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.178813E 06 | YYY | 4.814565E 04 |
| DXX | 2.892915E 03 | DYY | 3.840877E 02 |
| R | 6.705388E 06 | WT | 1.390762E 05 |
| V | 1.083915E 04 | PTH | 7.374890E 00 |
| ALT | 3.297324E 05 | LAT | -1.998959E 01 |
| VE | 1.043037E 04 | PTE | 7.665627E 00 |
| ANG | 9.944517E 00 | NFA | 9.491692E 00 |
| CPA | 7.317188E 01 | VPA | 7.317336E 01 |
| VYA | 1.075036E 01 | CRA | -0.000000E-39 |
| | | ZZZ | -2.604263E 06 |
| | | DZZ | -1.043891E 04 |
| | | F | 2.060472E 05 |
| | | AZ | 6.435464E 01 |
| | | LON | 8.704574E 01 |
| | | AZE | 6.325227E 01 |
| | | IAC | 1.621597E 01 |
| | | CYA | 1.075037E 01 |
| | | VRA | 0.000000E-39 |

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TABLE 10- LXXXV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 1 APRIL 1968 0 HRS., 38 MIN., 23.857 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 8.5307267D 03
X 1.7457504D 06 Y-6.0546897D 06 Z-2.2924489D 06
DX 1.0114097D 04 DY-9.9937287D 01 DZ 3.8964481D 03
R 6.7053884D 06 DEC-1.9991552D 01 RA-7.3916122D 01
V 1.0839154D 04 PTH 7.3748898D 00 AZ 6.4354129D 01
ALT 3.2973391D 05 LTGD-2.0109372D 01 LON 8.7044811D 01
VE 1.0430379D 04 PTE 7.6125811D 00 AZE 6.3237644D 01

PERISELENUM
TIME 4 APRIL 1968 3 HRS., 41 MIN., 40.654 SEC., GMT
SELENOCENTRIC REFERENCE
XSC 2.6776089D 05 YSC 1.7011805D 06 ZSC 7.4409611D 05
DXSC 2.4921358D 03 DYSC-2.8171031D 02 DZSC-2.5273135D 02
RSC 1.8760037D 06 DESC 2.3368228D 01 RASC 8.1055190D 01
VSC 2.5207092D 03 PTSC-1.6340816D-12 AZSC-9.6270399D 01
SELENOGRAPHIC REFERENCE
XSG-1.8685674D 06 YSG 1.5878712D 05 ZSG 5.1309059D 04
DXSG 2.0934665D 02 DYSG 2.5124462D 03 DZSG-1.5135293D 02
HSG 1.3791423D 05 LTSG 1.5672458D 00 LNSG 1.7514278D 02
VRSG 2.5256919D 03 PTSG 4.3227743D-09 AZSG-9.3436809D 01
LTS-1.4601735D-01 LNS 1.0766268D 02 LTE-6.1336905D 00
LNE-4.4660865D 00 DSMP 3.9360672D-01 RSMP 1.1197909D 02
LIN 1.7621692D 02 LAN-2.9299684D 01 LAP 1.5551040D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.7872752D 05
X 5.4497731D 07 Y 3.5363921D 08 Z 1.8966924D 08
DX 1.5272891D 03 DY-2.0464669D 02 DZ-1.7847704D 02
R 4.0497545D 08 DEC 2.7927082D 01 RA 8.1239320D 01
V 1.5512403D 03 PTH-2.0971530D 00 AZ-9.6366948D 01
ALT 3.9860197D 08 LTGD 2.7929583D 01 LON 1.9329795D 02
VE 2.7633424D 04 PTE-1.1771593D-01 AZE-9.0356437D 01

FREE-RETURN VACUUM PERIGEE
TIME 7 APRIL 1968 3 HRS., 47 MIN., 24.415 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.3827128D 05
X-2.1473944D 06 Y-6.1414469D 06 Z-2.8880447D 06
DX 9.4394056D 03 DY-1.1735881D 03 DZ-4.4958751D 03
R 7.1182494D 06 DEC-2.3936504D 01 RA-1.0927248D 02
V 1.0521054D 04 PTH-5.9910099D-02 AZ 1.1790428D 02
ALT 7.4361783D 05 LTGD-2.4064518D 01 LON 3.5839297D 02
VE 1.0104227D 04 PTE-2.0367773D-13 AZE 1.1916346D 02

TABLE 10-LXXXVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 17 HRS..49 MIN..26.540 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -6.120369E 06 | YYY -7.849366E 04 | TIME 1.388200E 04 | |
| DXX 2.857982E 03 | DYY -1.697057E 02 | ZZZ -2.419424E 06 | |
| R 6.581693E 06 | WT 2.963106E 05 | DZZ -7.237554E 03 | |
| V 7.783255E 03 | PTH 3.594028E-02 | F 1.493597E 01 | |
| ALT 2.096697E 05 | LAT -3.234578E 01 | AZ 9.393029E 01 | |
| VE 7.378787E 03 | PTE 3.791042E-02 | LON 6.611556E 01 | |
| ANG 3.877978E 00 | NFA 9.242707E 01 | AZE 9.414610E 01 | |
| CPA 6.458124E 01 | VPA 6.458124E 01 | IAC 9.203675E 00 | |
| VYA -1.200448E 00 | CRA -0.000000E-39 | CYA -1.200448E 00 | |
| | | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -3.986305E 06 | YYY -1.427448E 05 | TIME 1.434200E 04 | |
| DXX 6.195812E 03 | DYY -1.027792E 02 | 777 -5.238009E 06 | |
| R 6.583900E 06 | WT 2.951793E 05 | DZZ -4.717699E 03 | |
| V 7.788153E 03 | PTH 3.085706E-02 | F 2.073030E 05 | |
| ALT 2.108378E 05 | LAT -2.918546E 01 | AZ 7.487067E 01 | |
| VE 7.384337E 03 | PTE 3.254450E-02 | LON 1.004410E 02 | |
| ANG 3.963534E 00 | NFA 7.633342E 01 | AZE 7.402180E 01 | |
| CPA 3.341751E 01 | VPA 3.341751E 01 | IAC 1.186326E 01 | |
| VYA -6.702354E-01 | CRA -0.000000E-39 | CYA -6.702354E-01 | |
| | | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -1.410221E 06 | YYY -1.701138E 05 | TIME 1.465809E 04 | |
| DXX 1.027391E 04 | DYY -7.970306E 01 | 777 -6.543387E 06 | |
| R 6.695788E 06 | WT 1.388191E 05 | DZZ -3.478618E 03 | |
| V 1.084713E 04 | PTH 6.551661E 00 | F 2.060472E 05 | |
| ALT 3.201743E 05 | LAT -2.016644E 01 | AZ 6.378263E 01 | |
| VE 1.044071E 04 | PTE 6.807882E 00 | LON 1.249854E 02 | |
| ANG 2.456815E 00 | NFA 7.915419E 01 | AZE 6.266351E 01 | |
| CPA 1.652237E 01 | VPA 1.652168E 01 | IAC 1.647342E 01 | |
| VYA -1.077062E 00 | CRA -0.000000E-39 | CYA -1.077069E 00 | |
| | | VRA 0.000000E-39 | |

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TABLE 10-LXXXVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 31 MARCH 1968

21 HRS., 53 MIN., 44.676 SEC., GMT

GEOCENTRIC REFERENCE

FLIGHT TIME 1.46580860 04

| | | |
|-------------------|--------------------|-------------------|
| X 1.38685190 06 | Y-6.13030700 06 | Z-2.30858210 06 |
| DX 1.00478950 04 | DY-6.00905140 02 | DZ 4.04215630 03 |
| R 6.69578770 06 | DEC-2.01684420 01 | RA-7.72526180 01 |
| V 1.08471330 04 | PTH 6.55166140 00 | AZ 6.37822540 01 |
| ALT 3.20175950 05 | LTGD-2.02872970 01 | LON 1.24984470 02 |
| VE 1.04407140 04 | PTE 6.75328620 00 | AZE 6.26505810 01 |

PERISELENUM

TIME 4 APRIL 1968

0 HRS., 59 MIN., 50.284 SEC., GMT

SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC 3.09974470 05 | YSC 1.70972220 06 | ZSC 7.59086300 05 |
| DXSC 2.47184490 03 | DYSC-3.11695360 02 | DZSC-3.07338350 02 |
| RSC 1.89616620 06 | DESC 2.35986140 01 | RASC 7.97238320 01 |
| VSC 2.51030430 03 | PTSC 2.72770120-12 | AZSC-9.76778790 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.88910220 06 | YSG 1.51455070 05 | ZSG 6.16483240 04 |
| DXSG 1.94259300 02 | DYSG 2.50057060 03 | DZSG-1.90571580 02 |
| HSG 1.58076720 05 | LTSG 1.86313370 00 | LNSG 1.75416220 02 |
| VRSG 2.51533450 03 | PTSG 1.87604890-08 | AZSG-9.43474140 01 |
| LTS-1.48212100-01 | LNS 1.09034120 02 | LTE-6.06071500 00 |
| LNE-4.32921780 00 | DSMP 4.03752130-01 | RSMP 1.13208570 02 |
| LIN 1.75262860 02 | LAN-2.76968030 01 | LAP 1.56816090 02 |

GEOCENTRIC REFERENCE

FLIGHT TIME 2.85023740 05

| | | |
|-------------------|--------------------|-------------------|
| X 6.38930490 07 | Y 3.52796900 08 | Z 1.88908170 08 |
| DX 1.51036700 03 | DY-2.13530170 02 | DZ-2.21761780 02 |
| R 4.05258280 08 | DEC 2.77841960 01 | RA 7.97347460 01 |
| V 1.54142210 03 | PTH-1.90112490 00 | AZ-9.83498370 01 |
| ALT 3.98884760 08 | LTGD 2.77866870 01 | LON 2.32364020 02 |
| VE 2.76700440 04 | PTE-1.05907210-01 | AZE-9.04632430 01 |

FREE-RETURN VACUUM PERIGEE

TIME 7 APRIL 1968

1 HRS., 11 MIN., 21.778 SEC., GMT

GEOCENTRIC REFERENCE

FLIGHT TIME 5.44915240 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.02275370 06 | Y-5.42098800 06 | Z-2.63545210 06 |
| DX 1.01864960 04 | DY-1.77243650 03 | DZ-4.14449630 03 |
| R 6.35800680 06 | DEC-2.44884090 01 | RA-1.10462240 02 |
| V 1.11392590 04 | PTH-5.96989490-02 | AZ 1.14161740 02 |
| ALT-1.64681020 04 | LTGD-2.46342590 01 | LON 3.63210470 01 |
| VE 1.07556820 04 | PTE 3.58443780-12 | AZE 1.15081840 02 |

TABLE 10-LXXXVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH OF 81 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 19 HRS..51 MIN..30.750 SEC. G. M. T.

RESTART SEQUENCE INITIATION
GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -6.561483E 06 | YYY -1.116511F 04 | TIME 1.349900F 04 | |
| DXX -5.423004E 02 | DYY -1.334163E 02 | 777 4.543141F 05 | |
| R 6.577207E 06 | WT 2.976684E 05 | DZ7 -7.768481F 03 | |
| V 7.788529E 03 | PTH 3.406248F-02 | F 1.689210F 01 | |
| ALT 2.037117E 05 | LAT -2.782148E 01 | AZ 1.001063F 02 | |
| VE 7.371310E 03 | PTF 3.599053E-02 | LON 3.858906F 01 | |
| ANG 3.914860E 00 | NFA 9.834240E 01 | AZE 1.006848F 02 | |
| CPA 9.012266F 01 | VPA 9.012266F 01 | IAC 9.219153F 00 | |
| VYA -9.727521E-01 | CRA -0.000000F-39 | CYA -9.727521F-01 | |
| | | VRA -0.000000F-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL
GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -5.849902E 06 | YYY -6.915867E 04 | TIME 1.395900E 04 | |
| DXX 3.561802F 03 | DYY -1.125900E 02 | 777 -3.010959E 06 | |
| R 6.579666E 06 | WT 2.965352F 05 | DZ7 -6.929789F 03 | |
| V 7.792374E 03 | PTH 4.124205F-02 | F 2.073030E 05 | |
| ALT 2.064344E 05 | LAT -2.864927E 01 | AZ 8.282534E 01 | |
| VE 7.374803E 03 | PTF 4.357748F-02 | LON 7.219939E 01 | |
| ANG 3.893807E 00 | NFA 8.331625F 01 | AZE 8.741677E 01 | |
| CPA 5.892740E 01 | VPA 5.892740F 01 | IAC 1.185137E 01 | |
| VYA -7.853830E-01 | CRA -0.000000E-39 | CYA -7.853830F-01 | |
| | | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)
GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -4.071902F 06 | YYY -1.050375F 05 | TIME 1.427779F 04 | |
| DXX 7.791357E 03 | DYY -1.137180E 02 | 777 -5.312343F 06 | |
| R 6.694207E 06 | WT 1.394575E 05 | DZ7 -7.548319F 03 | |
| V 1.084875E 04 | PTH 6.630500F 00 | F 2.060472F 05 | |
| ALT 3.192510E 05 | LAT -2.274521E 01 | AZ 7.074744F 01 | |
| VE 1.042775E 04 | PTF 6.899466E 00 | LON 9.823531E 01 | |
| ANG 2.529300E 00 | NFA 7.286023F 01 | AZE 6.992584F 01 | |
| CPA 4.193307E 01 | VPA 4.193246E 01 | IAC 1.640612F 01 | |
| VYA -6.755089E-01 | CRA -0.000000E-39 | CYA -6.755074F-01 | |
| | | VRA 0.000000F-39 | |

D5-15481-1

TABLE 10-LXXXVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION
TIME 31 MARCH 1968 23 HRS., 49 MIN., 28.037 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.4277287D 04
X 1.5985966D 06 Y-5.9629669D 06 Z-2.5884210D 06
DX 1.0481413D 04 DY 1.9143876D 02 DZ 2.7926049D 03
R 6.6942071D 06 DEC-2.2747193D 01 RA-7.4992605D 01
V 1.0848747D 04 PTH 6.6305000D 00 AZ 7.0746964D 01
ALT 3.1925269D 05 LTGD-2.2878142D 01 LON 9.8234400D 01
VE 1.0427758D 04 PTE 6.8544985D 00 AZE 6.9910527D 01

PERISELENUM
TIME 4 APRIL 1968 2 HRS., 27 MIN., 17.145 SEC.,GMT
SELENOCENTRIC REFERENCE
XSC 2.6676936D 05 YSC 1.7135214D 06 ZSC 7.6559473D 05
DXSC 2.4841896D 03 DYSC-2.9226740D 02 DZSC-2.1146861D 02
RSC 1.8956415D 06 DE SC 2.3820400D 01 RASC 8.1150947D 01
VSC 2.5102465D 03 PTSC-7.2131093D-13 AZSC-9.5283646D 01
SELENOGRAPHIC REFERENCE
XSG-1.8896999D 06 YSG 1.3434844D 05 ZSG 6.6644047D 04
DXSG 1.7437954D 02 DYSG 2.5068615D 03 DZSG-1.0905605D 02
HSG 1.5755200D 05 LTSG 2.0147319D 00 LNSG 1.7593338D 02
VRSG 2.5152845D 03 PTSG 1.2088176D-08 AZSG-9.2486505D 01
LTS-1.4702737D-01 LNS 1.0829307D 02 LTE-6.1005489D 00
LNE-4.4034067D 00 DSMP 3.9827081D-01 RSMP 1.1254442D 02
LIN 1.7679623D 02 LAN-4.3003831D 01 LAP 1.4101895D 02
GEOCENTRIC REFERENCE FLIGHT TIME 2.8294640D 05
X 5.8800080D 07 Y 3.5328589D 08 Z 1.8934767D 08
DX 1.5208236D 03 DY-2.0549251D 02 DZ-1.3200125D 02
R 4.0511839D 08 DEC 2.7864909D 01 RA 8.0550440D 01
V 1.5403103D 03 PTH-7.4992371D-01 AZ-9.5165076D 01
ALT 3.9874489D 08 LTGD 2.7867405D 01 LON 2.1125794D 02
VE 2.7650679D 04 PTE-4.1786625D-02 AZE-9.0287307D 01

FREF-RETURN VACUUM PERIGEE
TIME 7 APRIL 1968 3 HRS., 1 MIN., 21.939 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 5.4419119D 05
X-1.9124061D 06 Y-5.5237459D 06 Z-2.5663316D 06
DX 9.7439489D 03 DY-9.0775507D 02 DZ-5.2717839D 03
R 6.3839740D 06 DEC-2.3703012D 01 RA-1.0909664D 02
V 1.1115767D 04 PTH-7.3500783D-02 AZ 1.2123299D 02
ALT 9.2797788D 03 LTGD-2.3844763D 01 LON 1.0110686D 01
VE 1.0753562D 04 PTE-1.9558996D-12 AZE 1.2241077D 02

TABLE 10-LXXXVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 31 MARCH 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - SECCND OPPORTUNITY

LAUNCH TIME = 21 HRS..41 MIN..41.280 SEC. G. M. T.

RESTART SEQUENCE INITIATION

GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|------------------|
| XXX -5.833715E 06 | YYY 1.216313E 04 | 777 3.030224E 06 | 04 1.314900E 04 |
| DXX -3.594373E 03 | DYY -7.130588E 01 | DZ7 -6.913338E 03 | 06 3.030224E 06 |
| R 6.573784E C6 | WT 2.982077E 05 | F 1.852970E 01 | 03 -6.913338E 03 |
| V 7.792229E C3 | PTH 2.093175E-02 | AZ 1.036000E 02 | 01 1.852970E 01 |
| ALT 1.995240E 05 | IAT -2.524819E 01 | LON 1.381832E 01 | 02 1.036000E 02 |
| VE 7.371518E 03 | PTF 2.212652E-02 | A7E 1.043925E 02 | 01 1.381832E 01 |
| ANG 3.951374E C0 | NFA 1.016488E 02 | IAC 9.230273E 00 | 02 1.043925E 02 |
| CPA 1.136006E 02 | VPA 1.136006E 02 | CYA -5.302882E-01 | 00 9.230273E 00 |
| VYA -5.302882E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 02 1.136006E 02 |

S-IVB STAGE AT OPERATING THRUST LEVEL

GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|------------------|
| XXX -6.561375E C6 | YYY -2.196408E 04 | Z7Z -4.337708E 05 | 04 1.360900E 04 |
| DXX 5.092714E 02 | DYY -7.353619E 01 | DZ7 -7.779298E 03 | 05 -4.337708E 05 |
| R 6.575735E 06 | WT 2.970729E 05 | F 2.073030E 05 | 03 -7.779298E 03 |
| V 7.796297E 03 | PTH 3.85F741E-02 | AZ 8.740290E 01 | 05 2.073030E 05 |
| ALT 2.024085E C5 | LAT -2.834912E 01 | LON 4.683506E 01 | 01 8.740290E 01 |
| VE 7.374753E 03 | PTF 4.079295E-02 | AZE 8.725434E 01 | 01 4.683506E 01 |
| ANG 3.875080E C0 | NFA 8.757412E 01 | IAC 1.185240E 01 | 01 8.725434E 01 |
| CPA 8.238434E 01 | VPA 8.238434E 01 | CYA -5.263088E-01 | 01 1.185240E 01 |
| VYA -5.263088E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 01 8.238434E 01 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|------------------|
| XXX -5.840696E 06 | YYY -4.739726E 04 | Z7Z -3.265528E C6 | 04 1.392877E 04 |
| DXX 4.157850E 03 | DYY -8.717086E 01 | DZ7 -1.007240E 04 | 06 -3.265528E C6 |
| R 6.691760E C6 | WT 1.397224E 05 | F 2.060472E 05 | 04 -1.007240E 04 |
| V 1.085098E 04 | PTH 6.681012E 00 | A7 7.472720E 01 | 05 2.060472E 05 |
| ALT 3.172333E 05 | LAT -2.431204E 01 | LON 7.357691E 01 | 01 7.472720E 01 |
| VE 1.042568E 04 | PTF 6.954873E 00 | A7E 7.407865E 01 | 01 7.357691E 01 |
| ANG 2.426746E 00 | NFA 7.691181E 01 | IAC 1.636948E 01 | 01 7.407865E 01 |
| CPA 6.537578E 01 | VPA 6.537488E 01 | CYA -5.568756E-01 | 01 1.636948E 01 |
| VYA -5.568404E-01 | CRA -0.000000E-39 | VRA 0.000000E-39 | 01 6.537578E 01 |

TABLE 10- CVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 90 DEGREES - SECOND OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 5 APRIL 1968 2 HRS., 47 MIN., 54.874 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4373014D 04

| | | |
|-------------------|--------------------|-------------------|
| X 5.9898608D 06 | Y-2.5392101D 06 | Z-1.5764348D 06 |
| DX 5.9235955D 03 | DY 8.0703347D 03 | DZ 4.1674756D 03 |
| R 6.6941143D 06 | DEC-1.3620841D 01 | RA-2.2972964D 01 |
| V 1.0843760D 04 | PTH 6.6606042D 00 | AZ 6.4759105D 01 |
| ALT 3.1714136D 05 | LTGD-1.3704964D 01 | LON 1.0157758D 02 |
| VE 1.0419621D 04 | PTE 6.8956742D 00 | AZE 6.3629274D 01 |

PERISELENUM

TIME 8 APRIL 1968 2 HRS., 24 MIN., 28.358 SEC., GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2585551D 06 | YSC 1.2629484D 06 | ZSC 6.3654275D 05 |
| DXSC 1.8844045D 03 | DYSC 1.4557898D 03 | DZSC 8.3739796D 02 |
| RSC 1.8931947D 06 | DESC 1.9647153D 01 | RASC 1.3490016D 02 |
| VSC 2.5241909D 03 | PTSC 3.8639017D-12 | AZSC-6.9374565D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8751361D 06 | YSG 2.2678286D 05 | ZSG 1.2892006D 05 |
| DXSG 3.1708909D 02 | DYSG 2.5000908D 03 | DZSG 2.1414418D 02 |
| HSG 1.5510523D 05 | LTSG 3.9046672D 00 | LNSG 1.7310401D 02 |
| VRSG 2.5292009D 03 | PTSG 2.9378295D-07 | AZSG-8.5131693D 01 |
| LTS-5.7265731D-02 | LNS 5.9550416D 01 | LTE-6.3311913D 00 |
| LNE-7.3360535D 00 | DSMP 3.5752517D-02 | RSMP 6.7028683D 01 |
| LIN 1.7375474D 02 | LAN-1.4830844D 02 | LAP 3.8753903D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7216650D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.5448623D 08 | Y 2.5311171D 08 | Z 1.4566720D 08 |
| DX 1.1658798D 03 | DY 8.1305501D 02 | DZ 5.1323048D 02 |
| R 3.8735992D 08 | DEC 2.2089303D 01 | RA 1.3515514D 02 |
| V 1.5112047D 03 | PTH-1.5805145D 00 | AZ-6.7798977D 01 |
| ALT 3.8098478D 08 | LTGD 2.2091505D 01 | LON 2.6262535D 02 |
| VE 2.7577966D 04 | PTE-8.6551793D-02 | AZE-8.8814011D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 10 APRIL 1968 21 HRS., 22 MIN., 7.539 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.1322568D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.3485606D 06 | Y-4.9095681D 06 | Z-2.4006302D 06 |
| DX 8.8654196D 03 | DY 6.5794202D 03 | DZ-1.0823418D 03 |
| R 6.4093481D 06 | DEC-2.1996588D 01 | RA-5.5704136D 01 |
| V 1.1093056D 04 | PTH-1.4033798D-02 | AZ 9.6046077D 01 |
| ALT 3.4196542D 04 | LTGD-2.2129826D 01 | LON 1.4460288D 02 |
| VE 1.0662210D 04 | PTE 3.6637463D-12 | AZE 9.6291375D 01 |

TABLE 10-CIX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 23 HRS..45 MIN..41.840 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -6.487604E 06 | YYY -1.425442E C4 | ZZZ 1.341500E 04 | |
| DXX -1.259272E 03 | DYY -1.527707E C1 | DZZ -7.689204E 03 | |
| R 6.573380E 06 | WT 2.977940E 05 | F 1.732275E 01 | |
| V 7.791654E 03 | PTH 3.573936E-02 | AZ 8.603607E 01 | |
| ALT 2.004265F 05 | LAT -2.952507E C1 | LON 3.279387F 01 | |
| VE 7.375616E 03 | PTE 3.775534E-C2 | AZE 8.581209E 01 | |
| ANG 3.878495E 00 | NFA 8.655532E C1 | IAC 9.228821E 00 | |
| CPA 9.543085E 01 | VPA 9.543085E C1 | CYA -1.037024E-01 | |
| VYA -1.037024E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -6.058797E 06 | YYY -2.006323E C4 | ZZZ -2.459840E 06 | |
| DXX 2.909925E 03 | DYY -9.161756E C0 | DZZ -7.232864E 03 | |
| R 6.576211E 06 | WT 2.966604E 05 | F 2.073030F 05 | |
| V 7.796285E 03 | PTH 5.009526E-C2 | AZ 7.049205E 01 | |
| ALT 2.013116F 05 | LAT -2.295723E C1 | LON 6.504741E 01 | |
| VE 7.381543E 03 | PTE 5.290936E-02 | AZE 6.934743F 01 | |
| ANG 4.038196E 00 | NFA 7.334200E C1 | IAC 1.186042E 01 | |
| CPA 6.421411E 01 | VPA 6.421411E C1 | CYA -5.538329E-02 | |
| VYA -5.538329E-02 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -4.541263E 06 | YYY -2.172347E 04 | ZZZ -4.915374F 06 | |
| DXX 7.057224E 03 | DYY -1.697947E-01 | DZZ -8.235006E 03 | |
| R 6.692118F 06 | WT 1.397281E C5 | F 2.060472E 05 | |
| V 1.084526E 04 | PTH 6.669576E 00 | AZ 6.287881E 01 | |
| ALT 3.150048E 05 | LAT -1.278182E 01 | LON 8.811510E 01 | |
| VE 1.042693E 04 | PTE 6.938454E C0 | AZE 6.167778E 01 | |
| ANG 2.695025E 00 | NFA 6.335546E C1 | IAC 1.637910E 01 | |
| CPA 4.726211E 01 | VPA 4.726145E C1 | CYA 1.424628E-02 | |
| VYA 1.424176E-02 | CRA -0.000000E-39 | VRA 0.000000E-39 | |

TABLE 10- CIX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 99 DEGREES - SECOND OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 5 APRIL 1968 3 HRS., 42 MIN., 15.038 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4193198D 04

| | | |
|-------------------|--------------------|-------------------|
| X 6.0156585D 06 | Y-2.5306011D 06 | Z-1.4806620D 06 |
| DX 5.8513657D 03 | DY 7.9395503D 03 | DZ 4.5105199D 03 |
| R 6.6921185D 06 | DEC-1.2782732D 01 | RA-2.2814980D 01 |
| V 1.0845263D 04 | PTH 6.6695764D 00 | AZ 6.2876954D 01 |
| ALT 3.1500583D 05 | LTGD-1.2862068D 01 | LON 8.8114362D 01 |
| VE 1.0426936D 04 | PTE 6.9008017D 00 | AZE 6.1667376D 01 |

PERISELENIUM

TIME 8 APRIL 1968 3 HRS., 20 MIN., 33.001 SEC.,GMT

SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2681778D 06 | YSC 1.2548575D 06 | ZSC 6.3201856D 05 |
| DXSC 1.8729191D 03 | DYSC 1.4762051D 03 | DZSC 8.2713959D 02 |
| RSC 1.8927202D 06 | DESC 1.9506922D 01 | RASC 1.3530248D 02 |
| VSC 2.5241172D 03 | PTSC 9.0088906D-13 | AZSC-6.9656395D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8743012D 06 | YSG 2.3030994D 05 | ZSG 1.2783523D 05 |
| DXSG 3.2075367D 02 | DYSG 2.5009532D 03 | DZSG 1.9708703D 02 |
| HSG 1.5463068D 05 | LTSG 3.8727323D 00 | LNSG 1.7299473D 02 |
| VRSG 2.5291289D 03 | PTSG 2.8459302D-07 | AZSG-8.5520335D 01 |
| LTS-5.6228064D-02 | LNS 5.9076092D 01 | LTE-6.3077362D 00 |
| LNE-7.3388379D 00 | DSMP 3.2225809D-02 | RSMP 6.6559550D 01 |
| LIN 1.7407432D 02 | LAN-1.4629656D 02 | LAP 4.0860519D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7209116D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.5690333D 08 | Y 2.5093094D 08 | Z 1.4456615D 08 |
| DX 1.1604075D 03 | DY 8.2747011D 02 | DZ 4.9951747D 02 |
| R 3.8712405D 08 | DEC 2.1927695D 01 | RA 1.3567379D 02 |
| V 1.5102219D 03 | PTH-1.7899311D 00 | AZ-6.8327154D 01 |
| ALT 3.8074887D 08 | LTGD 2.1929885D 01 | LON 2.4908627D 02 |
| VE 2.7595737D 04 | PTE-9.7896783D-02 | AZE-8.8842477D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 10 APRIL 1968 22 HRS., 10 MIN., 59.128 SEC.,GMT

GEOCENTRIC REFERENCE FLIGHT TIME 5.1271729D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.3970392D 06 | Y-4.8941030D 06 | Z-2.4271113D 06 |
| DX 8.9170219D 03 | DY 6.5287676D 03 | DZ-6.7980819D 02 |
| R 6.4329611D 06 | DEC-2.2166105D 01 | RA-5.5235147D 01 |
| V 1.1072499D 04 | PTH-8.8625945D-03 | AZ 9.3804868D 01 |
| ALT 5.7853733D 04 | LTGD-2.2299661D 01 | LON 1.3282347D 02 |
| VE 1.0639066D 04 | PTE-4.5297637D-12 | AZE 9.3960131D 01 |

TABLE 10-CX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 24 HRS..21 MIN..22.420 SEC. G. M. T.

RESTART SEQUENCE INITIATION
GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -6.297211E 06 | YYY -2.399825E C4 | ZZZ 1.330700E 04 | |
| DXX -2.234510E 03 | DYY 4.322467E 01 | DZZ -7.464797E 03 | |
| R 6.577136E 06 | WT 2.966341E C5 | F 1.788879E 01 | |
| V 7.792181F 03 | PTH 3.368641E-02 | AZ 8.196288F 01 | |
| ALT 2.000745F 05 | LAT -3.223415E C1 | LON 2.494757E 01 | |
| VE 7.390997E 03 | PTE 3.551484E-C2 | AZE 8.152350E 01 | |
| ANG 3.896654F 00 | NFA 8.333317E 01 | IAC 9.230551F 00 | |
| CPA 1.027945F 02 | VPA 1.027945E 02 | CYA 3.312411F-01 | |
| VYA 3.312411E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL
GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -6.362353E 06 | YYY -2.822910E C3 | ZZZ -1.658468E 06 | |
| DXX 1.959554E 03 | DYY 4.684605E 01 | DZZ -7.546813E 03 | |
| R 6.574957E 06 | WT 2.955000E C5 | F 2.073030E 05 | |
| V 7.797307F 03 | PTH 5.152235E-02 | AZ 6.569036F 01 | |
| ALT 2.001337E 05 | LAT -2.323787E C1 | LON 5.700156F 01 | |
| VE 7.398035E 03 | PTE 5.430272E-C2 | AZE 6.428561E 01 | |
| ANG 4.119333E 00 | NFA 7.004385E C1 | IAC 1.188051E 01 | |
| CPA 7.157149E 01 | VPA 7.157149E C1 | CYA 3.451303E-01 | |
| VYA 3.451303E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)
GEOCENTRIC REFERENCE

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--|
| XXX -5.135811E 06 | YYY 1.464505E C4 | ZZZ -4.287362E 06 | |
| DXX 5.946481E 03 | DYY 6.473453E 01 | DZZ -9.071115E 03 | |
| R 6.690160E 06 | WT 1.391992E C5 | F 2.060472E 05 | |
| V 1.084666F 04 | PTH 6.609211E 00 | AZ 5.864449E 01 | |
| ALT 3.128162F 05 | LAT -1.127670E C1 | LON 7.902456E 01 | |
| VF 1.044388E 04 | PTE 6.865302E C0 | AZE 5.726872F 01 | |
| ANG 2.976805E 00 | NFA -6.240154E C1 | IAC 1.646855E 01 | |
| CPA 5.437482E 01 | VPA 5.437538E C1 | CYA 3.553773E-01 | |
| VYA 3.553978E-01 | CRA -0.000000E-39 | VRA 0.000000F-39 | |

TABLE 10- CX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 4 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 108 DEGREES - SECOND OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION
 TIME 5 APRIL 1968 4 HRS., 16 MIN., 6.891 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4084471D 04

| | | |
|-------------------|--------------------|-------------------|
| X 6.0206274D 06 | Y-2.6073945D 06 | Z-1.3083492D 06 |
| DX 5.7861506D 03 | DY 7.5207494D 03 | DZ 5.2544031D 03 |
| R 6.6901598D 06 | DEC-1.1277627D 01 | RA-2.3416319D 01 |
| V 1.0846657D 04 | PTH 6.6092105D 00 | AZ 5.8642648D 01 |
| ALT 3.1281720D 05 | LTGD-1.1348173D 01 | LON 7.9023792D 01 |
| VE 1.0443892D 04 | PTE 6.8271460D 00 | AZE 5.7259693D 01 |

PERISELENUM
 TIME 8 APRIL 1968 4 HRS., 2 MIN., 26.338 SEC., GMT
 SELENCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.2730228D 06 | YSC 1.2527345D 06 | ZSC 6.2895709D 05 |
| DXSC 1.8676261D 03 | DYSC 1.5009933D 03 | DZSC 7.9049032D 02 |
| RSC 1.8935463D 06 | DESC 1.9399825D 01 | RASC 1.3546022D 02 |
| VSC 2.5230702D 03 | PTSC 3.4868734D-12 | AZSC-7.0599823D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8743972D 06 | YSG 2.3731738D 05 | ZSG 1.2583031D 05 |
| DXSG 3.2712142D 02 | DYSG 2.5021106D 03 | DZSG 1.5386742D 02 |
| HSG 1.5545684D 05 | LTSG 3.8102380D 00 | LNSG 1.7278417D 02 |
| VRSG 2.5280904D 03 | PTSG 2.7516397D-07 | AZSG-8.6502900D 01 |
| LTS-5.5450452D-02 | LNS 5.8721785D 01 | LTE-6.2898721D 00 |
| LNE-7.3405219D 00 | DSMP 2.9591700D-02 | RSMP 6.6208697D 01 |
| LIN 1.7482530D 02 | LAN-1.3987451D 02 | LAP 4.7457886D 01 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.7246392D 05

| | | |
|-------------------|--------------------|-------------------|
| X-2.5869327D 08 | Y 2.4929272D 08 | Z 1.4373644D 08 |
| DX 1.1596501D 03 | DY 8.4780294D 02 | DZ 4.6030061D 02 |
| R 3.8694862D 08 | DEC 2.1805766D 01 | RA 1.3606016D 02 |
| V 1.5084545D 03 | PTH-2.2072552D 00 | AZ-6.9859206D 01 |
| ALT 3.8057340D 08 | LTGD 2.1807948D 01 | LON 2.3897173D 02 |
| VE 2.7617886D 04 | PTE-1.2048680D-01 | AZE-8.8923175D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 10 APRIL 1968 22 HRS., 42 MIN., 46.430 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 5.1248401D 05

| | | |
|-------------------|--------------------|-------------------|
| X 3.4159714D 06 | Y-4.8579698D 06 | Z-2.4860819D 06 |
| DX 9.0858367D 03 | DY 6.3192628D 03 | DZ 1.3512406D 02 |
| R 6.4381157D 06 | DEC-2.2715184D 01 | RA-5.4886317D 01 |
| V 1.1068142D 04 | PTH 1.8021725D-03 | AZ 8.9240913D 01 |
| ALT 6.3153436D 04 | LTGD-2.2851217D 01 | LON 1.2520345D 02 |
| VE 1.0635121D 04 | PTE 1.2564471D-12 | AZE 8.9210002D 01 |

TABLE 10-CXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 20 HRS..13 MIN..04.350 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.108000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.512480E 06 | YYY | -1.354355E 05 | ZZZ -5.560945E 06 |
| DXX | 6.580105E 03 | DYY | -5.901681E 01 | DZZ -4.159540E 03 |
| R | 6.578751E 06 | WT | 2.972428E 05 | F 1.518699E 01 |
| V | 7.784795E 03 | PTH | 2.961323E-02 | AZ 7.246171E 01 |
| ALT | 2.052823E 05 | LAT | -2.789017E 01 | LON 1.277996E 02 |
| VE | 7.381604E 03 | PTE | 3.123060E-02 | AZE 7.146990E 01 |
| ANG | 3.996469E 00 | NFA | 7.441340E 01 | IAC 9.214763E 00 |
| CPA | 2.842931E 01 | VPA | 2.842931E 01 | CYA -3.537790E-01 |
| VYA | -3.537790E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.568000E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -1.246621E 05 | YYY | -1.426832E 05 | ZZZ -6.577442E 06 |
| DXX | 7.790317E 03 | DYY | 2.870188E 01 | DZZ -1.498715E 02 |
| R | 6.580170E 06 | WT | 2.961111E 05 | F 2.073030E 05 |
| V | 7.791811E 03 | PTH | 1.175449E-02 | AZ 6.082105E 01 |
| ALT | 2.034813E 05 | LAT | -1.519731E 01 | LON 1.566467E 02 |
| VE | 7.390967E 03 | PTE | 1.239206E-02 | AZE 5.907068E 01 |
| ANG | 4.247482E 00 | NFA | 6.441822E 01 | IAC 1.186586E 01 |
| CPA | -2.767009E 00 | VPA | -2.767009E 00 | CYA 2.944298E-01 |
| VYA | 2.544298E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 9.899376E 03 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | 2.842922E 06 | YYY | -1.033403E 05 | ZZZ -6.071676E 06 |
| DXX | 1.029434E 04 | DYY | 3.347001E 02 | DZZ 3.359081E 03 |
| R | 6.705083E 06 | WT | 1.392512E 05 | F 2.060472E 05 |
| V | 1.083369E 04 | PTH | 6.986863E 00 | AZ 5.859903E 01 |
| ALT | 3.269367E 05 | LAT | -1.706291E 00 | LON 1.779972E 02 |
| VE | 1.042287E 04 | PTE | 7.263706E 00 | AZE 5.718779E 01 |
| ANG | 8.202662E 00 | NFA | 1.140129E 01 | IAC 1.627501E 01 |
| CPA | -1.943558E 01 | VPA | -1.943607E 01 | CYA 8.408340E 00 |
| VYA | 8.408411E 00 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10- CXI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 72 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 6 APRIL 1968 22 HRS., 58 MIN., 3.726 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 9.8993758D 03
 X 6.6971520D 06 Y-2.5771268D 05 Z-1.9968104D 05
 DX 1.8359300D 03 DY 9.1142875D 03 DZ 5.5612869D 03
 R 6.7050827D 06 DEC-1.7065520D 00 RA-2.2037078D 00
 V 1.0833688D 04 PTH 6.9868623D 00 AZ 5.8597016D 01
 ALT 3.2693765D 05 LTGD-1.7174808D 00 LON 1.7799603D 02
 VE 1.0422881D 04 PTE 7.2577752D 00 AZE 5.7184525D 01

PERISELENUM

TIME 9 APRIL 1968 19 HRS., 24 MIN., 39.752 SEC.,GMT
 SELENOCENTRIC REFERENCE
 XSC-1.7098841D 06 YSC 7.3699333D 05 ZSC 2.9149578D 05
 DXSC 1.0569011D 03 DYSC 1.9776424D 03 DZSC 1.1995683D 03
 RSC 1.8846306D 06 DESC 8.8976560D 00 RASC 1.5668301D 02
 VSC 2.5430441D 03 PTSC 2.1504961D-12 AZSC-6.1480928D 01
 SELENOGRAPHIC REFERENCE
 XSG-1.8742361D 06 YSG 1.9742518D 05 ZSG 9.7498063D 03
 DXSG 2.6607850D 02 DYSG 2.5081237D 03 DZSG 3.6176660D 02
 HSG 1.4654116D 05 LTSG 2.9641098D-01 LNSG 1.7398684D 02
 VRSG 2.5480105D 03 PTSG-1.3244678D-07 AZSG-8.1837447D 01
 LTS-8.1136489D-03 LNS 3.8748843D 01 LTE-4.8126083D 00
 LNE-6.8673161D 00 DSMP-1.1854951D-01 RSMP 4.5812461D 01
 LIN 1.7181622D 02 LAN 1.7604838D 02 LAP 2.0827385D 00
 GEOCENTRIC REFERENCE FLIGHT TIME 2.5629540D 05
 X-3.3858542D 08 Y 1.4044861D 08 Z 8.7360620D 07
 DX 6.6150742D 02 DY 1.1183595D 03 DZ 7.4715486D 02
 R 3.7682592D 08 DEC 1.3405001D 01 RA 1.5747083D 02
 V 1.4988531D 03 PTH-1.6563827D-01 AZ-5.9127001D 01
 ALT 3.7044891D 08 LTGD 1.3406466D 01 LON 2.8209676D 01
 VE 2.8026969D 04 PTE-8.8179664D-03 AZE-8.8427492D 01

FREE-RETURN VACUUM PERIGEE

TIME 12 APRIL 1968 12 HRS., 30 MIN., 54.521 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 4.9067017D 05
 X 5.5334434D 06 Y-3.5668442D 06 Z-1.4809731D 06
 DX 5.3694993D 03 DY 9.1626660D 03 DZ-1.9927399D 03
 R 6.7479371D 06 DEC-1.2677934D 01 RA-3.2805728D 01
 V 1.0805415D 04 PTH-1.4762976D-02 AZ 1.0089951D 02
 ALT 3.7080748D 05 LTGD-1.2756009D 01 LON 2.9869786D 02
 VE 1.0334403D 04 PTE 1.0119131D-12 AZE 1.0140280D 02

TABLE 10-CXII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 21 HRS., 26 MIN., 11.230 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -4.856395E 06 | YYY -7.920464E 04 | ZZZ -4.432613E 06 | 8.877000E 03 |
| DXX 5.246573E 03 | DYY -6.137237E 01 | DZZ -5.755334E 03 | |
| R 6.575629E 06 | WT 2.985726E 05 | F 1.588565E 01 | |
| V 7.788078E 03 | PTH 4.095104E-02 | AZ 7.531167E 01 | |
| ALT 2.015402E 05 | LAT -2.583390E 01 | LON 1.101937E 02 | |
| VE 7.371413E 03 | PTE 4.326541E-02 | AZE 7.446106E 01 | |
| ANG 3.964516E 00 | NFA 7.688208E 01 | IAC 9.224746E 00 | |
| CPA 4.377783E 01 | VPA 4.377783E 01 | CYA -4.039237E-01 | |
| VYA -4.039237E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX -1.857179E 06 | YYY -9.556875E 04 | ZZZ -6.309620E 06 | 9.337000E 03 |
| DXX 7.475455E 03 | DYY -7.664572E 00 | DZZ -2.204336E 03 | |
| R 6.577960E 06 | WT 2.974403E 05 | F 2.073030E 05 | |
| V 7.793689E 03 | PTH 2.905372E-02 | AZ 6.416793E 01 | |
| ALT 2.011842E 05 | LAT -1.473346E 01 | LON 1.394846E 02 | |
| VE 7.378913E 03 | PTE 3.068700E-02 | AZE 6.259817E 01 | |
| ANG 4.177330E 00 | NFA 6.707543E 01 | IAC 1.184984E 01 | |
| CPA 1.255996E 01 | VPA 1.255996E 01 | CYA -3.695656E-05 | |
| VYA -3.695656E-05 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|--------------|
| XXX 1.153026E 06 | YYY -7.739744E 04 | ZZZ -6.602261E 06 | 9.669901E 03 |
| DXX 1.081986E 04 | DYY 2.142427E 02 | DZZ 5.510816E 02 | |
| R 6.702635E 06 | WT 1.399941E 05 | F 2.060472E 05 | |
| V 1.083600E 04 | PTH 6.975575E 00 | AZ 6.150218E 01 | |
| ALT 3.245096E 05 | LAT -2.458566E 00 | LON 1.616767E 02 | |
| VE 1.041277E 04 | PTE 7.260599E 00 | AZE 6.020970E 01 | |
| ANG 6.657584E 00 | NFA 1.391195E 01 | IAC 1.620097E 01 | |
| CPA -4.243529E 00 | VPA -4.244256E 00 | CYA 6.310673E 00 | |
| VYA 6.310768E 00 | CRA -0.000000E-39 | VRA 0.000000E-39 | |

TABLE 10- CXII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 7 APRIL 1968 0 HRS., 7 MIN., 21.131 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 9.6699010D 03

| | | |
|-------------------|--------------------|-------------------|
| X 6.6951056D 06 | Y-1.3488372D 05 | Z-2.8754789D 05 |
| DX 1.7250390D 03 | DY 9.4195571D 03 | DZ 5.0710146D 03 |
| R 6.7026350D 06 | DEC-2.4587849D 00 | RA-1.1541599D 00 |
| V 1.0836005D 04 | PTH 6.9755753D 00 | AZ 6.1500155D 01 |
| ALT 3.2451046D 05 | LTGD-2.4745266D 00 | LON 1.6167563D 02 |
| VE 1.0412780D 04 | PTE 7.2527714D 00 | AZE 6.0205861D 01 |

PERISELENUM

TIME 9 APRIL 1968 20 HRS., 17 MIN., 56.678 SEC.,GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.7313760D 06 | YSC 7.1672755D 05 | ZSC 2.8344111D 05 |
| DXSC 1.0185880D 03 | DYSC 1.9744246D 03 | DZSC 1.2293005D 03 |
| RSC 1.8951781D 06 | DESC 8.6013756D 00 | RASC 1.5751219D 02 |
| VSC 2.5391049D 03 | PTSC 1.5512129D-12 | AZSC-6.0682125D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8860118D 06 | YSG 1.8589790D 05 | ZSG 1.0060892D 04 |
| DXSG 2.4865512D 02 | DYSG 2.5015553D 03 | DZSG 3.9087980D 02 |
| HSG 1.5708856D 05 | LTSG 3.0416632D-01 | LNSG 1.7437072D 02 |
| VRSG 2.5440903D 03 | PTSG-1.2421585D-07 | AZSG-8.1161810D 01 |
| LTS-6.9678314D-03 | LNS 3.8298490D 01 | LTE-4.7689538D 00 |
| LNE-6.8435215D 00 | DSMP-1.2188250D-01 | RSMP 4.5338107D 01 |
| LIN 1.7113929D 02 | LAN 1.7632224D 02 | LAP 1.9750688D 00 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.5510545D 05

| | | |
|-------------------|--------------------|-------------------|
| X-3.3985783D 08 | Y 1.3767577D 08 | Z 8.5902805D 07 |
| DX 6.3141102D 02 | DY 1.1117048D 03 | DZ 7.7474787D 02 |
| R 3.7661287D 08 | DEC 1.3184831D 01 | RA 1.5794721D 02 |
| V 1.4949253D 03 | PTH 5.1065979D-01 | AZ-5.7979923D 01 |
| ALT 3.7023582D 08 | LTGD 1.3186274D 01 | LON 1.5329067D 01 |
| VE 2.8017757D 04 | PTE 2.7287400D-02 | AZE-8.8378923D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 12 APRIL 1968 13 HRS., 36 MIN., 3.369 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 4.9019214D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.4597065D 06 | Y-3.4143338D 06 | Z-1.3709222D 06 |
| DX 5.1492545D 03 | DY 9.2915196D 03 | DZ-2.6168659D 03 |
| R 6.5837298D 06 | DEC-1.2018576D 01 | RA-3.2020602D 01 |
| V 1.0940528D 04 | PTH-1.8622751D-02 | AZ 1.0415936D 02 |
| ALT 2.0649708D 05 | LTGD-1.2094705D 01 | LON 2.8315153D 02 |
| VE 1.0485853D 04 | PTE 1.9423806D-12 | AZE 1.0478703D 02 |

TABLE 10-CXIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 22 HRS..40 MIN..19.190 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -5.874668E 06 | YYY -3.275311E 04 | ZZZ -2.947177E 06 | 03 |
| DXX 3.488171E 03 | DYY -3.346883E C1 | DZZ -6.966591E 03 | |
| R 6.572568E 06 | WT 2.990852E 05 | F 1.660109E 01 | |
| V 7.791139E 03 | PTH 4.589922E-02 | AZ 7.604307E 01 | |
| ALT 1.982546E C5 | LAT -2.506227E C1 | LON 9.295948E 01 | |
| VE 7.370546E 03 | PTE 4.851820E-02 | AZE 7.522903E 01 | |
| ANG 3.957149E 00 | NFA 7.781820E 01 | IAC 9.233793E 00 | |
| CPA 5.953290E 01 | VPA 5.953290E 01 | CYA -2.263106E-01 | |
| VYA -2.263106E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -3.496557E 06 | YYY -4.360848E 04 | ZZZ -5.568556E 06 | 03 |
| DXX 6.599359E 03 | DYY -1.222572E C1 | DZZ -4.150388E 03 | |
| R 6.575456E 06 | WT 2.979522E 05 | F 2.073030E 05 | |
| V 7.795987E 03 | PTH 4.153945E-02 | AZ 6.515961E 01 | |
| ALT 1.986208E 05 | LAT -1.440621E C1 | LON 1.223367E 02 | |
| VE 7.377121E 03 | PTE 4.389766E-02 | AZE 6.364419E 01 | |
| ANG 4.157929E 00 | NFA 6.822298E C1 | IAC 1.184705E 01 | |
| CPA 2.829619E 01 | VPA 2.829619E 01 | CYA -6.400477E-02 | |
| VYA -6.400477E-02 | CRA -0.000000E-39 | VRA -0.000000E-39 | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -6.689783E 05 | YYY -3.270363E C4 | ZZZ -6.667243E 06 | 03 |
| DXX 1.057055E 04 | DYY 1.651707E C2 | DZZ -2.385005E 03 | |
| R 6.700801E 06 | WT 1.402761E 05 | F 2.060472E 05 | |
| V 1.083753E 04 | PTH 6.979629E 00 | AZ 6.243217E 01 | |
| ALT 3.226765E 05 | LAT -2.494222E C0 | LON 1.448043E 02 | |
| VE 1.041058E 04 | PTE 7.267387E 00 | AZE 6.117861E 01 | |
| ANG 6.181020E 00 | NFA 1.624072E C1 | IAC 1.618820E 01 | |
| CPA 1.127069E 01 | VPA 1.126995E 01 | CYA 5.563732E 00 | |
| VYA 5.563812E 00 | CRA -0.000000E-39 | VRA 0.000000E-39 | |

TABLE 10- CXIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 90 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION
 TIME 7 APRIL 1968 1 HRS., 17 MIN., 35.101 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 9.4359107D 03
 X 6.6942716D 06 Y-4.9103753D 04 Z-2.9163170D 05
 DX 1.6022782D 03 DY 9.5242083D 03 DZ 4.9167241D 03
 R 6.7008008D 06 DEC-2.4944099D 00 RA-4.2026786D-01
 V 1.0837528D 04 PTH 6.9796284D 00 AZ 6.2430152D 01
 ALT 3.2267748D 05 LTGD-2.5103835D 00 LON 1.4480325D 02
 VE 1.0410585D 04 PTE 7.2596788D 00 AZE 6.1174724D 01

PERISELENUM
 TIME 9 APRIL 1968 21 HRS., 21 MIN., 40.859 SEC.,GMT
 SELENOCENTRIC REFERENCE
 XSC-1.7483028D 06 YSC 6.9894432D 05 ZSC 2.7680613D 05
 DXSC 9.8747163D 02 DYSC 1.9790570D 03 DZSC 1.2396718D 03
 RSC 1.9030784D 06 DESC 8.3634408D 00 RASC 1.5820923D 02
 VSC 2.5354591D 03 PTSC 7.5243149D-13 AZSC-6.0383686D 01
 SELENOGRAPHIC REFERENCE
 XSG-1.8943398D 06 YSG 1.8184953D 05 ZSG 1.0715215D 04
 DXSG 2.4198202D 02 DYSG 2.4972317D 03 DZSG 3.9903482D 02
 HSG 1.6498893D 05 LTSG 3.2260351D-01 LNSG 1.7451661D 02
 VRSG 2.5404626D 03 PTSG-1.1363548D-07 AZSG-8.0962882D 01
 LTS-5.5928277D-03 LNS 3.7759784D 01 LTE-4.7161662D 00
 LNE-6.8142977D 00 DSMP-1.2586900D-01 RSMP 4.4769844D 01
 LIN 1.7093936D 02 LAN 1.7654004D 02 LAP 2.0489678D 00
 GEOCENTRIC REFERENCE FLIGHT TIME 2.5448167D 05
 X-3.4133651D 08 Y 1.3435106D 08 Z 8.4153053D 07
 DX 6.1018199D 02 DY 1.1123072D 03 DZ 7.8260208D 02
 R 3.7635430D 08 DEC 1.2920602D 01 RA 1.5851525D 02
 V 1.4906426D 03 PTH 7.1703170D-01 AZ-5.7600521D 01
 ALT 3.6997720D 08 LTGD 1.2922019D 01 LON 3.5991935D 02
 VE 2.8019216D 04 PTE 3.8185998D-02 AZE-8.8366631D 01

FREE-RETURN VACUUM PERIGEE
 TIME 12 APRIL 1968 14 HRS., 41 MIN., 45.098 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 4.8968591D 05
 X 5.4132597D 06 Y-3.2925272D 06 Z-1.3119364D 06
 DX 5.0576079D 03 DY 9.4172925D 03 DZ-2.7475488D 03
 R 6.4703395D 06 DEC-1.1698496D 01 RA-3.1309377D 01
 V 1.1036930D 04 PTH-1.9206061D-02 AZ 1.0473160D 02
 ALT 9.3058633D 04 LTGD-1.1774024D 01 LON 2.6739392D 02
 VE 1.0590745D 04 PTE 1.6485485D-12 AZE 1.0536724D 02

TABLE 10-CXIV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 23 HRS., 44 MIN., 53.960 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.398273E 06 | YYY | -5.452740E 03 |
| DXX | 1.764829E 03 | DYY | 1.682910E 01 |
| R | 6.570156E 06 | WT | 2.987624E C5 |
| V | 7.793292E 03 | PTH | 4.594043E-C2 |
| ALT | 1.560408E 05 | LAT | -2.574501E 01 |
| VE | 7.378338E 03 | PTE | 4.852432E-02 |
| ANG | 3.974623E 00 | NFA | 7.693063E 01 |
| CPA | 7.304152E 01 | VPA | 7.304152E 01 |
| VYA | 1.266604E-01 | CRA | -0.000000E-39 |
| | | ZZZ | -1.492989E 06 |
| | | DZZ | -7.590816E 03 |
| | | F | 1.728562F 01 |
| | | AZ | 7.450239E 01 |
| | | LON | 7.854469E 01 |
| | | AZE | 7.360694E 01 |
| | | IAC | 9.240187E 00 |
| | | CYA | 1.266604E-01 |
| | | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -4.697473E 06 | YYY | 1.739819E 03 |
| DXX | 5.450021E 03 | DYY | 1.403439E 01 |
| R | 6.573259E C6 | WT | 2.976288E C5 |
| V | 7.798019E 03 | PTH | 4.806769E-C2 |
| ALT | 1.963973E 05 | LAT | -1.426133E 01 |
| VE | 7.384946E 03 | PTE | 5.075611E-02 |
| ANG | 4.191646E 00 | NFA | 6.749069E 01 |
| CPA | 4.179124E 01 | VPA | 4.179124E 01 |
| VYA | 1.018646E-01 | CRA | -0.000000E-39 |
| | | ZZZ | -4.597986E 06 |
| | | DZZ | -5.577291E 03 |
| | | F | 2.073030E 05 |
| | | AZ | 6.356132E 01 |
| | | LON | 1.076738E 02 |
| | | AZE | 6.195636E 01 |
| | | IAC | 1.185629E 01 |
| | | CYA | 1.018646E-01 |
| | | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -2.201784E 06 | YYY | 2.039667E 04 |
| DXX | 9.721781E 03 | DYY | 1.967941E 02 |
| R | 6.700259E 06 | WT | 1.400894E 05 |
| V | 1.083772E 04 | PTH | 7.027588E 00 |
| ALT | 3.221135E 05 | LAT | -1.735041E 00 |
| VE | 1.041583E 04 | PTE | 7.313768E C0 |
| ANG | 6.826711E 00 | NFA | 1.512504E 01 |
| CPA | 2.472250E 01 | VPA | 2.472193E 01 |
| VYA | 6.338020E 00 | CRA | -0.000000E-39 |
| | | ZZZ | -6.328128E 06 |
| | | DZZ | -4.785864E 03 |
| | | F | 2.060472E 05 |
| | | AZ | 6.118629E 01 |
| | | LON | 1.298310E 02 |
| | | AZE | 5.988079E 01 |
| | | IAC | 1.619988E 01 |
| | | CYA | 6.337970E 00 |
| | | VRA | 0.000000E-39 |

TABLE 10- CXIV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - FIRST OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 7 APRIL 1968 2 HRS., 18 MIN., 50.244 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 9.23628380 03
X 6.6971847D 06 Y-4.5175391D 03 Z-2.0288742D 05
DX 1.4887032D 03 DY 9.4233949D 03 DZ 5.1419486D 03
R 6.7002587D 06 DEC-1.7352120D 00 RA-3.8648460D-02
V 1.0837723D 04 PTH 7.0275884D 00 AZ 6.1184262D 01
ALT 3.2211435D 05 LTGD-1.7463322D 00 LON 1.2982984D 02
VE 1.0415835D 04 PTE 7.3081819D 00 AZE 5.9877453D 01

PERISELENUM

TIME 9 APRIL 1968 22 HRS., 26 MIN., 6.189 SEC.,GMT
SELENOCENTRIC REFERENCE
XSC-1.7681089D 06 YSC 6.8756669D 05 ZSC 2.7144211D 05
DXSC 9.6191312D 02 DYSC 1.9886401D 03 DZSC 1.2284185D 03
RSC 1.9164128D 06 DESC 8.1427988D 00 RASC 1.5875037D 02
VSC 2.5276428D 03 PTSC 2.4999786D-12 AZSC-6.0597393D 01
SELENOGRAPHIC REFERENCE
XSG-1.9075826D 06 YSG 1.8347491D 05 ZSG 1.0174409D 04
DXSG 2.4169385D 02 DYSG 2.4915201D 03 DZSG 3.8523568D 02
HSG 1.7832330D 05 LTSG 3.0418989D-01 LNSG 1.7450607D 02
VRSG 2.5326853D 03 PTSG-1.0271677D-07 AZSG-8.1250901D 01
LTS-4.1982111D-03 LNS 3.7215290D 01 LTE-4.6621856D 00
LNE-6.7839185D 00 DSMP-1.2989792D-01 RSMP 4.4194540D 01
LIN 1.7122823D 02 LAN 1.7647786D 02 LAP 1.9950989D 00
GEOCENTRIC REFERENCE FLIGHT TIME 2.5447223D 05
X-3.4279525D 08 Y 1.3098168D 08 Z 8.2376124D 07
DX 5.9468113D 02 DY 1.1179073D 03 DZ 7.6885172D 02
R 3.7609920D 08 DEC 1.2651928D 01 RA 1.5908819D 02
V 1.4813829D 03 PTH 6.0742657D-01 AZ-5.8023233D 01
ALT 3.6972206D 08 LTGD 1.2653318D 01 LON 3.4434266D 02
VE 2.8027173D 04 PTE 3.2143989D-02 AZE-8.8396120D 01

FREE-RETURN VACUUM PERIGEE

TIME 12 APRIL 1968 15 HRS., 43 MIN., 11.118 SEC.,GMT
GEOCENTRIC REFERENCE FLIGHT TIME 4.8949716D 05
X 5.3024294D 06 Y-3.1423734D 06 Z-1.2774122D 06
DX 5.1191374D 03 DY 9.6440112D 03 DZ-2.4579248D 03
R 6.2946048D 06 DEC-1.1708796D 01 RA-3.0652210D 01
V 1.1191690D 04 PTH-1.7435188D-02 AZ 1.0296469D 02
ALT-8.2674308D 04 LTGD-1.1786510D 01 LON 2.5265062D 02
VE 1.0754161D 04 PTE 5.1168330D-12 AZE 1.0350195D 02

TABLE 10-CXV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - FIRST OPPORTUNITY

LAUNCH TIME = 24 HRS..34 MIN..56.940 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.559038E 06 | YYY | 4.543652E 03 |
| DXX | 4.159146E 02 | DYY | 7.600743E 01 |
| R | 6.568674E 06 | WT | 2.976101E 05 |
| V | 7.794249E 03 | PTH | 4.503905E-02 |
| ALT | 1.951299E 05 | LAT | -2.764602E C1 |
| VE | 7.394393E 03 | PTE | 4.747463E-C2 |
| ANG | 4.C17734E 00 | NFA | 7.459796E 01 |
| CPA | 8.307082E 01 | VPA | 8.307082E C1 |
| VYA | 5.548231E-01 | CRA | -0.000000E-39 |
| | | ZZZ | -3.556444E 05 |
| | | DZZ | -7.782773E 03 |
| | | F | 1.784493E 01 |
| | | AZ | 7.098184E J1 |
| | | LON | 6.808501E 01 |
| | | AZE | 6.991039E J1 |
| | | IAC | 9.243227E 00 |
| | | CYA | 5.548231E-01 |
| | | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.424611E 06 | YYY | 3.616420E 04 |
| DXX | 4.396968E 03 | DYY | 5.849321E 01 |
| R | 6.571845E 06 | WT | 2.964759E C5 |
| V | 7.799239E 03 | PTH | 5.084128E-C2 |
| ALT | 1.949870E 05 | LAT | -1.428187E 01 |
| VE | 7.401687E 03 | PTE | 5.357202E-C2 |
| ANG | 4.274457E 00 | NFA | 6.526370E C1 |
| CPA | 5.181203E 01 | VPA | 5.181203E 01 |
| VYA | 4.C74805E-01 | CRA | -0.000000E-39 |
| | | ZZZ | -3.709640E 06 |
| | | DZZ | -6.441381E J3 |
| | | F | 2.073030E 05 |
| | | AZ | 5.976676E 01 |
| | | LON | 9.657735E 01 |
| | | AZE | 5.795630E 01 |
| | | IAC | 1.187624E 01 |
| | | CYA | 4.074805E-01 |
| | | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -3.272067E 06 | YYY | 7.262095E C4 |
| DXX | 8.729188E 03 | DYY | 2.869433E 02 |
| R | 6.700802E 06 | WT | 1.394254E C5 |
| V | 1.C83679E 04 | PTH | 7.094936E C0 |
| ALT | 3.226376E 05 | LAT | -3.514166E-C1 |
| VE | 1.042864E 04 | PTE | 7.374125E C0 |
| ANG | 8.288415E 00 | NFA | 1.149873E C1 |
| CPA | 3.495882E 01 | VPA | 3.495819E C1 |
| VYA | 8.223529E 00 | CRA | -0.000000E-39 |
| | | ZZZ | -5.847140E 06 |
| | | DZZ | -6.415210E J3 |
| | | F | 2.060472E 05 |
| | | AZ | 5.806165E 01 |
| | | LON | 1.178565E 02 |
| | | AZE | 5.662953E 01 |
| | | IAC | 1.622437E 01 |
| | | CYA | 8.223453E 00 |
| | | VRA | 0.000000E-39 |

TABLE 10- CXV TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 108 DEGREES - FIRST OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION
 TIME 7 APRIL 1968 3 HRS., 6 MIN., 25.916 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 9.0889758D 03

| | | |
|-------------------|--------------------|-------------------|
| X 6.7006688D 06 | Y-9.5842462D 03 | Z-4.1118129D 04 |
| DX 1.3864293D 03 | DY 9.1237003D 03 | DZ 5.6808354D 03 |
| R 6.7008018D 06 | DEC-3.5158627D-01 | RA-8.1952484D-02 |
| V 1.0836788D 04 | PTH 7.0949361D 00 | AZ 5.8059631D 01 |
| ALT 3.2263853D 05 | LTGD-3.5384058D-01 | LON 1.1785533D 02 |
| VE 1.0428650D 04 | PTE 7.3728790D 00 | AZE 5.6627185D 01 |

PERISELENUM
 TIME 9 APRIL 1968 23 HRS., 26 MIN., 7.424 SEC.,GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.7931011D 06 | YSC 6.8327548D 05 | ZSC 2.6911183D 05 |
| DXSC 9.4216938D 02 | DYSC 2.0013503D 03 | DZSC 1.1962733D 03 |
| RSC 1.9376527D 06 | DESC 7.9833588D 00 | RASC 1.5914025D 02 |
| VSC 2.5147875D 03 | PTSC-8.6781967D-13 | AZSC-6.1291673D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.9282954D 06 | YSG 1.8994245D 05 | ZSG 9.8394035D 03 |
| DXSG 2.4638823D 02 | DYSG 2.4831584D 03 | DZSG 3.5084288D 02 |
| HSG 1.9956320D 05 | LTSG 2.9094930D-01 | LNSG 1.7437434D 02 |
| VRSG 2.5198956D 03 | PTSG-9.2716713D-08 | AZSG-8.1996649D 01 |
| LTS-2.8945427D-03 | LNS 3.6708006D 01 | LTE-4.6113314D 00 |
| LNE-6.7548555D 00 | DSMP-1.3365113D-01 | RSMP 4.3657705D 01 |
| LIN 1.7197521D 02 | LAN 1.7643854D 02 | LAP 2.0845934D 00 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.5507048D 05

| | | |
|-------------------|--------------------|-------------------|
| X-3.4412577D 08 | Y 1.2783513D 08 | Z 8.0714663D 07 |
| DX 5.8436483D 02 | DY 1.1269894D 03 | DZ 7.3442284D 02 |
| R 3.7587128D 08 | DEC 1.2400283D 01 | RA 1.5962107D 02 |
| V 1.4666166D 03 | PTH 2.3412002D-01 | AZ-5.9214399D 01 |
| ALT 3.6949410D 08 | LTGD 1.2401649D 01 | LON 3.2982932D 02 |
| VE 2.8039542D 04 | PTE 1.2282232D-02 | AZE-8.8465945D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 12 APRIL 1968 16 HRS., 36 MIN., 52.042 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 4.8971510D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.1026814D 06 | Y-2.9488873D 06 | Z-1.2571607D 06 |
| DX 5.3297373D 03 | DY 9.9722553D 03 | DZ-1.7463507D 03 |
| R 6.0260889D 06 | DEC-1.2041473D 01 | RA-3.0024017D 01 |
| V 1.1441229D 04 | PTH-1.3015501D-02 | AZ 9.8981703D 01 |
| ALT-3.5113977D 05 | LTGD-1.2124842D 01 | LON 2.3982156D 02 |
| VE 1.1016942D 04 | PTE 1.6514796D-12 | AZE 9.9330650D 01 |

TABLE 10-CXVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 72 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 20 HRS., 13 MIN., 04.350 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -3.401094E 06 | YYY -1.512888E 05 | ZZZ -5.635830E 06 | 04 |
| DXX 6.660639E 03 | DYY -8.496427E 01 | DZZ -4.022135E 03 | 06 |
| R 6.584292E 06 | WT 2.962248E 05 | F 1.318360E 01 | 03 |
| V 7.781317E 03 | PTH 3.071466E-02 | AZ 7.168275E 01 | 01 |
| ALT 2.106758E 05 | LAT -2.741030E 01 | LON 1.067629E 02 | 02 |
| VE 7.377900E 03 | PTE 3.239382E-02 | AZE 7.064242E 01 | 02 |
| ANG 4.008823E 00 | NFA 7.359162E 01 | IAC 9.199538E 00 | 00 |
| CPA 2.725721E 01 | VPA 2.725721E 01 | CYA -5.353630E-01 | 01 |
| VYA -5.353630E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 01 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX 5.036393E 03 | YYY -1.676325E 05 | ZZZ -6.583561E 06 | 04 |
| DXX 7.788344E 03 | DYY 1.607904E 01 | DZZ 4.159279E 00 | 06 |
| R 6.585697E 06 | WT 2.950950E 05 | F 2.073030E 05 | 00 |
| V 7.788361E 03 | PTH 1.021792E-02 | AZ 6.046972E 01 | 05 |
| ALT 2.088698E 05 | LAT -1.445284E 01 | LON 1.353049E 02 | 01 |
| VE 7.387290E 03 | PTE 1.077282E-02 | AZE 5.869168E 01 | 02 |
| ANG 4.258856E 00 | NFA 6.385636E 01 | IAC 1.186848E 01 | 01 |
| CPA -3.899370E 00 | VPA -3.899370E 00 | CYA 2.164513E-01 | 01 |
| VYA 2.164513E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 01 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX 2.829690E 06 | YYY -1.486804E 05 | ZZZ -6.065425E 06 | 04 |
| DXX 1.028387E 04 | DYY 1.079340E 02 | DZZ 3.432369E 03 | 06 |
| R 6.694672E 06 | WT 1.390097E 05 | F 2.060472E 05 | 03 |
| V 1.084208E 04 | PTH 6.538591E 00 | AZ 5.743622E 01 | 05 |
| ALT 3.165199E 05 | LAT -1.424558E 00 | LON 1.555399E 02 | 01 |
| VE 1.043686E 04 | PTE 6.793633E 00 | AZE 5.598383E 01 | 02 |
| ANG 2.212058E 00 | NFA 4.938800E 01 | IAC 1.636130E 01 | 01 |
| CPA -1.991375E 01 | VPA -1.991313E 01 | CYA 5.624789E-01 | 01 |
| VYA 5.624736E-01 | CRA -0.000000E-39 | VRA 0.000000E-39 | 01 |

TABLE 10- CXVI TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH OF 72 DEGREES - SECOND OPPORTUNITY (CONTINUED)

TRANSLUNAR INJECTION
 TIME 7 APRIL 1968 0 HRS., 26 MIN., 31.582 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.5207232D 04

| | | |
|-------------------|--------------------|-------------------|
| X 6.6863112D 06 | Y-2.9010239D 05 | Z-1.6646556D 05 |
| DX 1.7706066D 03 | DY 9.0097059D 03 | DZ 5.7654904D 03 |
| R 6.6946716D 06 | DEC-1.4248282D 00 | RA-2.4843629D 00 |
| V 1.0842081D 04 | PTH 6.5385904D 00 | AZ 5.7434202D 01 |
| ALT 3.1652079D 05 | LTGD-1.4339688D 00 | LON 1.5553876D 02 |
| VE 1.0436867D 04 | PTE 6.7885126D 00 | AZE 5.5980834D 01 |

PERISELENUM
 TIME 9 APRIL 1968 20 HRS., 50 MIN., 44.055 SEC., GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.7291719D 06 | YSC 7.1641063D 05 | ZSC 2.8370946D 05 |
| DXSC 1.0220326D 03 | DYSC 1.9950498D 03 | DZSC 1.1913426D 03 |
| RSC 1.8930850D 06 | DESC 8.6191725D 00 | RASC 1.5749535D 02 |
| VSC 2.5385176D 03 | PTSC-5.0038943D-13 | AZSC-6.1662315D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8828541D 06 | YSG 1.9627214D 05 | ZSG 1.0403460D 04 |
| DXSG 2.6313401D 02 | DYSG 2.5058233D 03 | DZSG 3.4792559D 02 |
| HSG 1.5499547D 05 | LTSG 3.1487088D-01 | LNSG 1.7404887D 02 |
| VRSG 2.5435098D 03 | PTSG-1.1954318D-07 | AZSG-8.2137762D 01 |
| LTS-6.2610444D-03 | LNS 3.8021348D 01 | LTE-4.7418739D 00 |
| LNE-6.8285906D 00 | DSMP-1.2393344D-01 | RSMP 4.5045874D 01 |
| LIN 1.7211611D 02 | LAN 1.7632334D 02 | LAP 2.2961500D 00 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.6145971D 05

| | | |
|-------------------|--------------------|-------------------|
| X-3.4061236D 08 | Y 1.3597611D 08 | Z 8.5007517D 07 |
| DX 6.3993430D 02 | DY 1.1302456D 03 | DZ 7.3548927D 02 |
| R 3.7647385D 08 | DEC 1.3049881D 01 | RA 1.5823758D 02 |
| V 1.4926204D 03 | PTH-1.7955710D-01 | AZ-5.9566197D 01 |
| ALT 3.7009677D 08 | LTGD 1.3051311D 01 | LON 7.3995855D 00 |
| VE 2.8041052D 04 | PTE-9.5192322D-03 | AZE-8.8454939D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 12 APRIL 1968 13 HRS., 51 MIN., 4.686 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 4.9548034D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.3391311D 06 | Y-3.3153438D 06 | Z-1.4077955D 06 |
| DX 5.4388990D 03 | DY 9.4837789D 03 | DZ-1.6956061D 03 |
| R 6.4404746D 06 | DEC-1.2625976D 01 | RA-3.1838292D 01 |
| V 1.1063397D 04 | PTH-1.2806368D-02 | AZ 9.9039233D 01 |
| ALT 6.3337006D 04 | LTGD-1.2707487D 01 | LON 7.7956807D 02 |
| VE 1.0611044D 04 | PTE 4.6101448D-12 | AZE 9.9428032D 01 |

TABLE 10-CXVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 21 HRS., 26 MIN., 11.230 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -4.756956E 06 | YYY -9.361636E 04 | ZZZ -4.546818E 06 | 04 |
| DXX 5.375206E 03 | DYY -8.737286E 01 | DZZ -5.630320E 03 | 06 |
| R 6.581105E 06 | WT 2.975495E 05 | F 1.385051E 01 | 03 |
| V 7.784663E 03 | PTH 4.316690E-02 | AZ 7.450636E 01 | 01 |
| ALT 2.068844E 05 | LAT -2.538196E 01 | LON 8.932551E 01 | 01 |
| VE 7.367753E 03 | PTE 4.560953E-02 | AZE 7.360562E 01 | 01 |
| ANG 3.975670E 00 | NFA 7.603894E 01 | IAC 9.209646E 00 | 01 |
| CPA 4.245810E 01 | VPA 4.245810E 01 | CYA -5.866390E-01 | 00 |
| VYA -5.866390E-01 | CRA -0.000000E-39 | VRA -0.000000E-39 | 01 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX -1.717212E 06 | YYY -1.192838E 05 | ZZZ -6.354478E 06 | 04 |
| DXX 7.519509E 03 | DYY -2.111620E 01 | DZZ -2.035703E 03 | 06 |
| R 6.583497E 06 | WT 2.964191E 05 | F 2.073030E 05 | 03 |
| V 7.790221E 03 | PTH 2.876912E-02 | AZ 6.377667E 01 | 05 |
| ALT 2.065874E 05 | LAT -1.398933E 01 | LON 1.183309E 02 | 01 |
| VE 7.375202E 03 | PTE 3.038824E-02 | AZE 6.217735E 01 | 01 |
| ANG 4.188509E 00 | NFA 6.648826E 01 | IAC 1.185219E 01 | 01 |
| CPA 1.127880E 01 | VPA 1.127880E 01 | CYA -8.489156E-02 | 01 |
| VYA -8.489156E-02 | CRA -0.000000E-39 | VRA -0.000000E-39 | 01 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|-------------------|-------------------|----|
| XXX 1.160355E 06 | YYY -1.175251E 05 | ZZZ -6.593738E 06 | 04 |
| DXX 1.082243E 04 | DYY 3.475191E 01 | DZZ 6.373358E 02 | 06 |
| R 6.696090E 06 | WT 1.396161E 05 | F 2.060472E 05 | 02 |
| V 1.084124E 04 | PTH 6.606055E 00 | AZ 6.058435E 01 | 05 |
| ALT 3.179543E 05 | LAT -2.122929E 00 | LON 1.393932E 02 | 01 |
| VE 1.042189E 04 | PTE 6.873124E 00 | AZE 5.925716E 01 | 01 |
| ANG 2.487279E 00 | NFA 5.737406E 01 | IAC 1.635148E 01 | 01 |
| CPA -5.219497E 00 | VPA -5.220228E 00 | CYA 2.022180E-01 | 01 |
| VYA 2.022326E-01 | CRA -0.000000E-39 | VRA 0.000000E-39 | 01 |

TABLE 10- CXVII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 81 DEGREES - SECOND OPPORTUNITY
(CONTINUED)

TRANSLUNAR INJECTION

TIME 7 APRIL 1968 1 HRS., 35 MIN., 49.178 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 1.4977948D 04

| | | |
|-------------------|--------------------|-------------------|
| X 6.6898743D 06 | Y-1.4717180D 05 | Z-2.4807345D 05 |
| DX 1.6482769D 03 | DY 9.3467059D 03 | DZ 5.2397263D 03 |
| R 6.6960898D 06 | DEC-2.1231517D 00 | RA-1.2602573D 00 |
| V 1.0841239D 04 | PTH 6.6060538D 00 | AZ 6.0582327D 01 |
| ALT 3.1795521D 05 | LTGD-2.1367623D 00 | LON 1.3939212D 02 |
| VE 1.0421896D 04 | PTE 6.8661590D 00 | AZE 5.9253653D 01 |

PERISELENUM

TIME 9 APRIL 1968 21 HRS., 43 MIN., 18.319 SEC., GMT
SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.7390983D 06 | YSC 6.9422210D 05 | ZSC 2.7524204D 05 |
| DXSC 9.8960405D 02 | DYSC 1.9931961D 03 | DZSC 1.2254594D 03 |
| RSC 1.8926610D 06 | DESC 8.3619460D 00 | RASC 1.5823884D 02 |
| VSC 2.5404523D 03 | PTSC 1.3597387D-12 | AZSC-6.0819555D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8834240D 06 | YSG 1.8643983D 05 | ZSG 1.0947079D 04 |
| DXSG 2.5011893D 02 | DYSG 2.5043694D 03 | DZSG 3.8053923D 02 |
| HSG 1.5457147D 05 | LTSG 3.3139843D-01 | LNCG 1.7434671D 02 |
| VRSG 2.5454342D 03 | PTSG-1.1032445D-07 | AZSG-8.1401971D 01 |
| LTS-5.1252409D-03 | LNS 3.7577014D 01 | LTF-4.6981166D 00 |
| LNE-6.8041946D 00 | DSMP-1.2722142D-01 | RSMP 4.4576837D 01 |
| LIN 1.7137881D 02 | LAN 1.7653307D 02 | LAP 2.2113218D 00 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.6022709D 05

| | | |
|-------------------|--------------------|-------------------|
| X-3.4181464D 08 | Y 1.3322089D 08 | Z 8.3557912D 07 |
| DX 6.1568330D 02 | DY 1.1250991D 03 | DZ 7.6754625D 02 |
| R 3.7625387D 08 | DEC 1.2831144D 01 | RA 1.5870684D 02 |
| V 1.4946709D 03 | PTH 3.6389343D-01 | AZ-5.8315756D 01 |
| ALT 3.6987676D 08 | LTGD 1.2832552D 01 | LON 3.5469006D 02 |
| VE 2.8034602D 04 | PTE 1.9440357D-02 | AZE-8.8395355D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 12 APRIL 1968 14 HRS., 51 MIN., 4.309 SEC., GMT
GEOCENTRIC REFERENCE FLIGHT TIME 4.9469308D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.3832636D 06 | Y-3.2626807D 06 | Z-1.3333955D 06 |
| DX 5.1891193D 03 | DY 9.5043096D 03 | DZ-2.2909412D 03 |
| R 6.4344818D 06 | DEC-1.1959870D 01 | RA-3.1219154D 01 |
| V 1.1068300D 04 | PTH-1.6411947D-02 | AZ 1.0221821D 02 |
| ALT 5.7240341D 04 | LTGD-1.2037418D 01 | LON 2.6514772D 02 |
| VE 1.0620117D 04 | PTE-6.4779053D-13 | AZE 1.0274233D 02 |

TABLE 10-CXVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 90 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 22 HRS., 40 MIN., 19.190 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.396700E 04 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -5.803928E 06 | YYY | -4.626692E 04 | ZZZ -3.095450E 06 |
| DXX | 3.659256E 03 | DYY | -6.017493E 01 | DZZ -6.874339E 03 |
| R | 6.577957E 06 | WT | 2.980567E 05 | F 1.453343E 01 |
| V | 7.787831E 03 | PTH | 4.909973E-02 | AZ 7.520879E 01 |
| ALT | 2.035128E 05 | LAT | -2.460140E 01 | LON 7.220943E 01 |
| VE | 7.366995E 03 | PTE | 5.190518E-02 | AZE 7.434280E 01 |
| ANG | 3.968324E 00 | NFA | 7.695378E 01 | IAC 9.218911E 00 |
| CPA | 5.810333E 01 | VPA | 5.810333E 01 | CYA -4.145327E-01 |
| VYA | -4.145327E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.442700E 04 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -3.363014E 06 | YYY | -6.684183E 04 | ZZZ -5.656409E 06 |
| DXX | 6.695244E 03 | DYY | -2.673443E 01 | DZZ -3.987068E 03 |
| R | 6.580980E 06 | WT | 2.969257E 05 | F 2.073030E 05 |
| V | 7.792543E 03 | PTH | 4.253582E-02 | AZ 6.474739E 01 |
| ALT | 2.040086E 05 | LAT | -1.363704E 01 | LON 1.013017E 02 |
| VE | 7.373432E 03 | PTE | 4.495359E-02 | AZE 6.320120E 01 |
| ANG | 4.169276E 00 | NFA | 6.762059E 01 | IAC 1.184929E 01 |
| CPA | 2.690430E 01 | VPA | 2.690430E 01 | CYA -1.568533E-01 |
| VYA | -1.568533E-01 | CRA | -0.000000E-39 | VRA -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | | 1.474395E 04 |
|----------------------|---------------|-------------|---------------|-------------------|
| XXX | -6.475377E 05 | YYY | -7.124627E 04 | ZZZ -6.664710E 06 |
| DXX | 1.059554E 04 | DYY | 5.868380E-01 | DZZ -2.293704E 03 |
| R | 6.696472E 06 | WT | 1.398573E 05 | F 2.060472E 05 |
| V | 1.084096E 04 | PTH | 6.665011E 00 | AZ 6.159106E 01 |
| ALT | 3.183364E 05 | LAT | -2.118176E 00 | LON 1.226282E 02 |
| VE | 1.041736E 04 | PTE | 6.937341E 00 | AZE 6.030464E 01 |
| ANG | 2.685676E 00 | NFA | 6.086955E 01 | IAC 1.635429E 01 |
| CPA | 1.012956E 01 | VPA | 1.012884E 01 | CYA 3.025594E-02 |
| VYA | 3.026413E-02 | CRA | -0.000000E-39 | VRA 0.000000E-39 |

TABLE 10- CXVIII TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 90 DEGREES - SECOND OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION

TIME 7 APRIL 1968 2 HRS., 46 MIN., 3.138 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4743948D 04

| | | |
|-------------------|--------------------|-------------------|
| X 6.6917166D 06 | Y-4.8948323D 04 | Z-2.4752844D 05 |
| DX 1.5159977D 03 | DY 9.4599747D 03 | DZ 5.0731781D 03 |
| R 6.6964720D 06 | DEC-2.1183641D 00 | RA-4.1909756D-01 |
| V 1.0840964D 04 | PTH 6.6650096D 00 | AZ 6.1589039D 01 |
| ALT 3.1833734D 05 | LTGD-2.1319433D 00 | LON 1.2262704D 02 |
| VE 1.0417365D 04 | PTF 6.9306060D 00 | AZE 6.0301096D 01 |

PERISELENUM

TIME 9 APRIL 1968 22 HRS., 46 MIN., 13.423 SEC.,GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.7495737D 06 | YSC 6.7544229D 05 | ZSC 2.6804177D 05 |
| DXSC 9.6133016D 02 | DYSC 1.9987435D 03 | DZSC 1.2381728D 03 |
| RSC 1.8944859D 06 | DESC 8.1337987D 00 | RASC 1.5889036D 02 |
| VSC 2.5401187D 03 | PTSC 2.5551200D-12 | AZSC-6.0501535D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8855862D 06 | YSG 1.8306152D 05 | ZSG 1.1392124D 04 |
| DXSG 2.4535927D 02 | DYSG 2.5029697D 03 | DZSG 3.9049709D 02 |
| HSG 1.5639637D 05 | LTSG 3.4453912D-01 | LNSG 1.7445483D 02 |
| VRSG 2.5451025D 03 | PTSG-9.9257636D-08 | AZSG-8.1174036D 01 |
| LTS-3.7616504D-03 | LNS 3.7045233D 01 | LTE-4.6451981D 00 |
| LNE-6.7742574D 00 | DSMP-1.3115614D-01 | RSMP 4.4014668D 01 |
| LIN 1.7115008D 02 | LAN 1.7666824D 02 | LAP 2.2400549D 00 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.5955423D 05

| | | |
|-------------------|--------------------|-------------------|
| X-3.4321814D 08 | Y 1.2991764D 08 | Z 8.1817454D 07 |
| DX 5.9725243D 02 | DY 1.1267855D 03 | DZ 7.7783582D 02 |
| R 3.7599386D 08 | DEC 1.2568293D 01 | RA 1.5926694D 02 |
| V 1.4937820D 03 | PTH 5.1435471D-01 | AZ-5.7891793D 01 |
| ALT 3.6961671D 08 | LTGD 1.2569676D 01 | LON 3.3947750D 02 |
| VE 2.8037396D 04 | PTF 2.7442662D-02 | AZE-8.8377318D 01 |

FREE-RETURN VACUUM PERIGEE

TIME 12 APRIL 1968 15 HRS., 53 MIN., 43.666 SEC.,GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 4.9400448D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.3946977D 06 | Y-3.1885465D 06 | Z-1.2893618D 06 |
| DX 5.0794564D 03 | DY 9.5725873D 03 | DZ-2.4040480D 03 |
| R 6.3978157D 06 | DEC-1.1626535D 01 | RA-3.0585291D 01 |
| V 1.1100214D 04 | PTH-1.6797232D-02 | AZ 1.0277798D 02 |
| ALT 2.0524240D 04 | LTGD-1.1702481D 01 | LON 2.5007471D 02 |
| VE 1.0655047D 04 | PTF-3.0465873D-12 | AZE 1.0332148D 02 |

TABLE 10-CXIX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 99 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 23 HRS., 44 MIN., 53.960 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.366009E 06 | YYY | -1.894851E 04 |
| ZZZ | -1.646236E 06 | DYY | -1.106584E 01 |
| DXX | 1.943830E 03 | DZZ | -7.543693E 03 |
| R | 6.575448E 06 | WT | 2.977300E 05 |
| F | 1.552413E 01 | PTH | 4.973814E-02 |
| V | 7.790116E 03 | AZ | 7.368437E 01 |
| ALT | 2.011913E 05 | LAT | -2.525751E 01 |
| LON | 5.772271E 01 | PTE | 5.253834E-02 |
| VE | 7.374936E 03 | AZE | 7.273787E 01 |
| ANG | 3.986620E 00 | NFA | 7.608494E 01 |
| IAC | 9.225585E 00 | VPA | 7.168058E 01 |
| CPA | 7.168058E 01 | CYA | -7.006397E-02 |
| VYA | -7.006397E-02 | CRA | -0.000000E-39 |
| VRA | -0.000000E-39 | | |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -4.593630E 06 | YYY | -2.198304E 04 |
| ZZZ | -4.709337E 06 | DYY | -1.432508E 00 |
| DXX | 5.575006E 03 | DZZ | -5.447543E 03 |
| R | 6.578737E 06 | WT | 2.965981E 05 |
| F | 2.073030E 05 | PTH | 5.009373E-02 |
| V | 7.794641E 03 | AZ | 6.317616E 01 |
| ALT | 2.017390E 05 | LAT | -1.348144E 01 |
| LON | 8.655864E 01 | PTE | 5.289933E-02 |
| VE | 7.381330E 03 | AZE | 6.154189E 01 |
| ANG | 4.203043E 00 | NFA | 6.690809E 01 |
| IAC | 1.185862E 01 | VPA | 4.046749E 01 |
| CPA | 4.046749E 01 | CYA | 2.415394E-03 |
| VYA | 2.415394E-03 | CRA | -0.000000E-39 |
| VRA | -0.000000E-39 | | |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -2.188572E 06 | YYY | -2.065863E 04 |
| ZZZ | -6.326819E 06 | DYY | 1.103292E 01 |
| DXX | 9.764934E 03 | DZZ | -4.711524E 03 |
| R | 6.694693E 06 | WT | 1.397223E 05 |
| F | 2.060472E 05 | PTH | 6.675309E 00 |
| V | 1.084216E 04 | AZ | 6.024117E 01 |
| ALT | 3.165401E 05 | LAT | -1.379077E 00 |
| LON | 1.075774E 02 | PTE | 6.944194E 00 |
| VE | 1.042429E 04 | AZE | 5.889977E 01 |
| ANG | 2.752304E 00 | NFA | 6.030124E 01 |
| IAC | 1.637200E 01 | VPA | 2.363241E 01 |
| CPA | 2.363308E 01 | CYA | 8.913911E-02 |
| VYA | 8.913820E-02 | CRA | -0.000000E-39 |
| VRA | 0.000000E-39 | | |

TABLE 10- CXIX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH OF 99 DEGREES - SECOND OPPORTUNITY (CONTINUED)

TRANSLUNAR INJECTION
 TIME 7 APRIL 1968 3 HRS., 47 MIN., 16.092 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4542132D 04
 X 6.6927373D 06 Y-1.4485519D 04 Z-1.6114222D 05
 DX 1.4088510D 03 DY 9.3453011D 03 DZ 5.3134734D 03
 R 6.6946926D 06 DEC-1.3792508D 00 RA-1.2400872D-01
 V 1.0842164D 04 PTH 6.6753087D 00 AZ 6.0239149D 01
 ALT 3.1654099D 05 LTGD-1.3880992D 00 LON 1.0757626D 02
 VE 1.0424295D 04 PTE 6.9396168D 00 AZE 5.8896739D 01

PERISELENUM
 TIME 9 APRIL 1968 23 HRS., 50 MIN., 33.984 SEC., GMT
 SELENOCENTRIC REFERENCE
 XSC-1.7536220D 06 YSC 6.6256633D 05 ZSC 2.6242962D 05
 DXSC 9.4432692D 02 DYSC 2.0124877D 03 DZSC 1.2292281D 03
 RSC 1.8928956D 06 DESC 7.9691128D 00 RASC 1.5930206D 02
 VSC 2.5402484D 03 PTSC-5.8383757D-13 AZSC-6.0750120D 01
 SELENOGRAPHIC REFERENCE
 XSG-1.8835227D 06 YSG 1.8781341D 05 ZSG 1.1039407D 04
 DXSG 2.5194287D 02 DYSG 2.5044859D 03 DZSG 3.7720152D 02
 HSG 1.5480607D 05 LTSG 3.3415207D-01 LNSG 1.7430563D 02
 VRSG 2.5452319D 03 PTSG-8.8442417D-08 AZSG-8.1477263D 01
 LTS-2.3624449D-03 LNS 3.6501423D 01 LTE-4.5904677D 00
 LNE-6.7428103D 00 DSMP-1.3517947D-01 RSMP 4.3438854D 01
 LIN 1.7145409D 02 LAN 1.7652989D 02 LAP 2.2492071D 00
 GEOCENTRIC REFERENCE FLIGHT TIME 2.5954002D 05
 X-3.4460821D 08 Y 1.2653105D 08 Z 8.0029976D 07
 DX 5.9037714D 02 DY 1.1366724D 03 DZ 7.6645965D 02
 R 3.7572559D 08 DEC 1.2298284D 01 RA 1.5983809D 02
 V 1.4926586D 03 PTH 1.7523782D-01 AZ-5.8339682D 01
 ALT 3.6934839D 08 LTGD 1.2299639D 01 LON 3.2391894D 02
 VE 2.8051055D 04 PTE 9.3626279D-03 AZE-8.8399515D 01

FREE-RETURN VACUUM PERIGEE
 TIME 12 APRIL 1968 16 HRS., 47 MIN., 56.878 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 4.9338292D 05
 X 5.4431612D 06 Y-3.1578156D 06 Z-1.3009264D 06
 DX 5.1114349D 03 DY 9.6267093D 03 DZ-1.9677439D 03
 R 6.4259017D 06 DEC-1.1680288D 01 RA-3.0119891D 01
 V 1.1075753D 04 PTH-1.3781030D-02 AZ 1.0045532D 02
 ALT 4.8618152D 04 LTGD-1.1756230D 01 LON 2.3694795D 02
 VF 1.0624818D 04 PTE 3.4145037D-12 AZE 1.0090439D 02

TABLE 10-CXX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
OF 108 DEGREES - SECOND OPPORTUNITY

LAUNCH TIME = 24 HRS., 34 MIN., 56.940 SEC. G. M. T.

RESTART SEQUENCE INITIATION

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -6.556046E 06 | YYY | -1.001383E 04 |
| DXX | 5.667709E 02 | DYY | 4.696679E 01 |
| R | 6.573887E 06 | WT | 2.965756E 05 |
| V | 7.791189E 03 | PTH | 4.900613E-02 |
| ALT | 2.001902E 05 | LAT | -2.714734E 01 |
| VE | 7.391133E 03 | PTE | 5.165873E-02 |
| ANG | 4.030515E 00 | NFA | 7.382343E 01 |
| CPA | 8.195818E 01 | VPA | 8.195818E 01 |
| VYA | 3.505159E-01 | CRA | -0.000000E-39 |
| | | ZZZ | -4.838942E 05 |
| | | DZZ | -7.770405E 03 |
| | | F | 1.631115E 01 |
| | | AZ | 7.024557E 01 |
| | | LON | 4.699744E 01 |
| | | AZE | 6.912786E 01 |
| | | IAC | 9.228865E 00 |
| | | CYA | 3.505159E-01 |
| | | VRA | -0.000000E-39 |

S-IVB STAGE AT OPERATING THRUST LEVEL

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -5.358217E 06 | YYY | 1.103855E 04 |
| DXX | 4.515248E 03 | DYY | 4.273158E 01 |
| R | 6.577268E 06 | WT | 2.954430E 05 |
| V | 7.795938E 03 | PTH | 5.349095E-02 |
| ALT | 2.002807E 05 | LAT | -1.354116E 01 |
| VE | 7.398161E 03 | PTE | 5.636758E-02 |
| ANG | 4.285343E 00 | NFA | 6.473211E 01 |
| CPA | 5.073648E 01 | VPA | 5.073648E 01 |
| VYA | 3.068684E-01 | CRA | -0.000000E-39 |
| | | ZZZ | -3.814426E 06 |
| | | DZZ | -6.355105E 03 |
| | | F | 2.073030E 05 |
| | | AZ | 5.945305E 01 |
| | | LON | 7.519481E 01 |
| | | AZE | 5.761735E 01 |
| | | IAC | 1.187880E 01 |
| | | CYA | 3.068684E-01 |
| | | VRA | -0.000000E-39 |

TRANSLUNAR INJECTION (S-IVB CUTOFF)

| GEOCENTRIC REFERENCE | | FLIGHT TIME | |
|----------------------|---------------|-------------|---------------|
| XXX | -3.284167E 06 | YYY | 2.587260E 04 |
| DXX | 8.772291E 03 | DYY | 5.228366E 01 |
| R | 6.691531E 06 | WT | 1.392053E 05 |
| V | 1.084428E 04 | PTH | 6.615194E 00 |
| ALT | 3.133666E 05 | LAT | -1.068543E-01 |
| VE | 1.044192E 04 | PTE | 6.871304E 00 |
| ANG | 2.813534E 00 | NFA | 5.794080E 01 |
| CPA | 3.388628E 01 | VPA | 3.388582E 01 |
| VYA | 3.065541E-01 | CRA | -0.000000E-39 |
| | | ZZZ | -5.830109E 06 |
| | | DZZ | -6.375150E 03 |
| | | F | 2.060472E 05 |
| | | AZ | 5.686251E 01 |
| | | LON | 9.535167E 01 |
| | | AZE | 5.538814E 01 |
| | | IAC | 1.642866E 01 |
| | | CYA | 3.065585E-01 |
| | | VRA | 0.000000E-39 |

TABLE 10- CXX TRANSLUNAR TRAJECTORY CHARACTERISTICS FOR
 LAUNCH ON 6 APRIL 1968 ALONG A LAUNCH AZIMUTH
 OF 108 DEGREES - SECOND OPPORTUNITY
 (CONTINUED)

TRANSLUNAR INJECTION
 TIME 7 APRIL 1968 4 HRS., 34 MIN., 47.414 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 1.4300474D 04

| | | |
|-------------------|--------------------|-------------------|
| X 6.6913255D 06 | Y-5.1003810D 04 | Z-1.2500742D 04 |
| DX 1.3289808D 03 | DY 9.0100464D 03 | DZ 5.8865299D 03 |
| R 6.6915316D 06 | DEC-1.0703681D-01 | RA-4.3672159D-01 |
| V 1.0844278D 04 | PTH 6.6151942D 00 | AZ 5.6860493D 01 |
| ALT 3.1336757D 05 | LTGD-1.0772408D-01 | LON 9.5350510D 01 |
| VE 1.0441928D 04 | PTE 6.8709071D 00 | AZF 5.5385970D 01 |

PERISFL ENUM
 TIME 10 APRIL 1968 0 HRS., 49 MIN., 47.087 SEC., GMT
 SELENOCENTRIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSC-1.7573688D 06 | YSC 6.5625616D 05 | ZSC 2.5934155D 05 |
| DXSC 9.3575643D 02 | DYSC 2.0318197D 03 | DZSC 1.1994796D 03 |
| RSC 1.8937463D 06 | DESC 7.8711797D 00 | RASC 1.5952280D 02 |
| VSC 2.5382440D 03 | PTSC-4.3168902D-12 | AZSC-6.1506607D 01 |

SELENOGRAPHIC REFERENCE

| | | |
|--------------------|--------------------|--------------------|
| XSG-1.8833530D 06 | YSG 1.9785099D 05 | ZSG 1.0565286D 04 |
| DXSG 2.6519179D 02 | DYSG 2.5060865D 03 | DZSG 3.4244876D 02 |
| HSG 1.5565683D 05 | LTSG 3.1965709D-01 | LNSG 1.7400292D 02 |
| VRSG 2.5432395D 03 | PTSG-8.2963426D-08 | AZSG-8.2261457D 01 |
| LTS-1.0705054D-03 | LNS 3.6000929D 01 | LTE-4.5395495D 00 |
| LNE-6.7131244D 00 | DSMP-1.3888196D-01 | RSMP 4.2908079D 01 |
| LIN 1.7223974D 02 | LAN 1.7634926D 02 | LAP 2.3679989D 00 |

GEOCENTRIC REFERENCE FLIGHT TIME 2.6009015D 05

| | | |
|-------------------|--------------------|-------------------|
| X-3.4585293D 08 | Y 1.2340669D 08 | Z 7.8378710D 07 |
| DX 5.9118270D 02 | DY 1.1525362D 03 | DZ 7.3451601D 02 |
| R 3.7548193D 08 | DEC 1.2048618D 01 | RA 1.6036266D 02 |
| V 1.4890771D 03 | PTH-4.7765787D-01 | AZ-5.9590456D 01 |
| ALT 3.6910470D 08 | LTGD 1.2049948D 01 | LON 3.0959838D 02 |
| VE 2.8071705D 04 | PTE-2.5301583D-02 | AZE-8.8461447D 01 |

FREE-RETURN VACUUM PERIGEE
 TIME 12 APRIL 1968 17 HRS., 31 MIN., 54.113 SEC., GMT
 GEOCENTRIC REFERENCE FLIGHT TIME 4.9301717D 05

| | | |
|-------------------|--------------------|-------------------|
| X 5.4544220D 06 | Y-3.1150168D 06 | Z-1.3440086D 06 |
| DX 5.2552247D 03 | DY 9.6879564D 03 | DZ-1.1189461D 03 |
| R 6.4234265D 06 | DEC-1.2077552D 01 | RA-2.9730657D 01 |
| V 1.1078173D 04 | PTH-8.1004362D-03 | AZ 9.5930443D 01 |
| ALT 4.6202967D 04 | LTGD-1.2155952D 01 | LON 2.2631862D 02 |
| VE 1.0622695D 04 | PTE 1.0990999D-12 | AZE 9.6185706D 01 |