IMP 7 (EXPLORER 47) TRAJECTORY
SEPTEMBER 26, 1972 TO SEPTEMBER 25, 1978
by
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This report contains trajectory plots for IMP-7 (Explorer 47). For each orbit the trajectory is shown in five panels on two pages; each panel is a different representation or projection. The trajectory parameters were obtained from the multi-coordinate ephemeris (MCE) tapes supplied to IMP experimenters by the IMP project.

The plots on the right hand pages use a geocentric, solar-ecliptic coordinate system (the XSE-axis points towards the Sun; the YSE-axis is in the ecliptic plane oppositely directed to the motion of the earth in its orbit; and the ZSE-axis completes the right-handed coordinate system). Distances are in units of Earth radii (6371 km). The upper panel shows the trajectory in cylindrical coordinates. The Sun-Earth line is the axis of the cylinder and one would expect the earth's bow shock and magnetopause to be roughly symmetric about that axis (neglecting aberration of the flow). Average shock and magnetopause shapes are shown on the plot to give a sense of the region which the spacecraft is traversing. The moon's position is also shown in the upper panel of most of the plots; the orbit of the moon clearly is badly distorted on the remaining plots due to bad data on the MCE tapes. Note that the node number may also be incorrect.

The plots on the left-hand pages use geocentric, solar magnetospheric coordinates with distances in Earth radii (the XGSM-axis points at the sun; the XGSM-ZGSM plane contains the geomagnetic dipole such that ZGSM is positive northward; and the YGSM-axis completes the right-handed coordinate system). Two different weight lines are used; the lighter line corresponds to negative values of ZGSM in the upper panel and to values of XGSM less than -10 in the lower panel.
Time is indicated by a symbol at the beginning of each day; normally the day number for every second day is given. Similar plots of the trajectory have been distributed by King and Teague.\textsuperscript{2}

\textsuperscript{1} Model shock and magnetopause are taken from, "Explorer 33 and 35 Plasma observations of Magnetosheath Flow," H. C. Howe, Jr., and J. H. Binsack, JGR 77, 3334 (1972), Equations 1 and 2.

IMP 7 FROM SEP 26 TO SEP 28 1972

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 0
FROM SEP 26 TO SEP 28 1972
DAYS 270 THRU 272

SATellite AND MOon ORBIts

\(\Delta = 0000 \text{ UT}\)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 1
FROM SEP 28 TO OCT 10 1972
DAYS 272 THRU 284

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM OCT 10 TO OCT 23 1972

VIEW FROM NORTH

VIEW FROM SUN

YCSM

XCSM

ZCSM

YCSM
IMP 7 TRAJECTORY. ASCENDING NODE 2
FROM OCT 10 TO OCT 23 1972
DAYS 284 THRU 297

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM OCT 23 TO NOV 4 1972

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NOE 3
FROM OCT 23 TO NOV 4 1972
DAYS 297 THRU 309

SATELLITE AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 4 TO NOV 16 1972

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY, ASCENDING NODE 4
FROM NOV 4 TO NOV 16 1972
DAYS 309 THRU 321

SATELLITE AND MOON ORBITS

\[ (YSE^2 + ZSE^2)^{1/2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 16 TO NOV 28 1972

VIEW FROM NORTH

VIEW FROM SUN

XYCSM

YZCSM
IMP 7 TRAJECTORY.  ASCENDING NODE 5
FROM NOV 16 TO NOV 28 1972
DAYS 321 THRU 333

SATELLITE AND MOON ORBITS

\[ (YSE^2 + ZSE^2)^{1/2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research

03/14/88
IMP 7 FROM NOV 28 TO DEC 11 1972

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 6
FROM NOV 28 TO DEC 11 1972
DAYS 333 THRU 346

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 11 TO DEC 23 1972

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM

XGSM

YGSM
IMP 7 TRAJECTORY.
ASCENDING NODE 7
FROM DEC 11 TO DEC 23 1972
DAYS 346 THRU 358

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 23 TO JAN 4 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY
ASCENDING NODE 8
FROM DEC 23 TO JAN 4 1973
DAYS 358 THRU 4

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 4 TO JAN 16 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJEKTORY. ASCENDING_NODE 9
FROM JAN 4 TO JAN 16 1973
DAYS 4 THRU 16

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 16 TO JAN 28 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 10
FROM JAN 16 TO JAN 28 1973
DAYS 16 THRU 28

SATELLITE AND MOON ORBITS

<Diagram of satellite and moon orbits with dates marked from Jan 16 to Jan 28, 1973, indicating node 10 trajectory.>

VIEW FROM NORTH

<Diagram showing view from north with dates marked.

VIEW FROM SUN

<Diagram showing view from sun with dates marked.>
IMP 7 TRAJECTORY. ASCENDING NODE 11
FROM JAN 28 TO FEB 9 1973
DAYS 28 THRU 40

SATellite AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 12
FROM FEB 9 TO FEB 21 1973
DAYS 40 THRU 52

SATellite AND moON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM FEB 21 TO MAR 5 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 13
FROM FEB 21 TO MAR 5 1973
DAYS 52 THRU 64

SATellite AND MOON OrBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 5 TO MAR 18 1973

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM
IMP 7 TRAJECTORY. ASCENDING NODE 14
FROM MAR 5 TO MAR 18 1973
DAYS 64 THRU 77

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 15
FROM MAR 18 TO MAR 30 1973
DAYS 77 THRU 89

SATELLITE AND MOON ORBITS

\[ (YSE^2 + ZSE^2)^{1/2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 30 TO APR 11 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 Trajectory. Ascending Node 16

From Mar 30 to Apr 11 1973

Days 89 Thru 101

Satellite and Moon Orbits

\( \Delta = 0000 \text{ UT} \)
IMP 7 FROM APR 11 TO APR 23 1973

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM
IMP 7 TRAJECTORY. ASCENDING NODE 17
FROM APR 11 TO APR 23 1973
DAYS 101 THRU 113

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM APR 23 TO MAY 5 1973

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM

XGSM
IMP 7 TRAJECTORY. ASCENDING NODE 18
FROM APR 23 TO MAY 5 1973
DAYS 113 THRU 125

SATELLITE AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 5 TO MAY 17 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 19
FROM MAY 5 TO MAY 17 1973
DAYS 125 THRU 137

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research

3/14/88
IMP 7 FROM MAY 17 TO MAY 29 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 20
FROM MAY 17 TO MAY 29 1973
DAYS 137 THRU 149

SATELLITE AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 21
FROM MAY 29 TO JUN 11 1973
DAYS 149 THRU 162

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 22
FROM JUN 11 TO JUN 23 1973
DAYS 162 THRU 174

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUN 23 TO JUL 5 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 23
FROM JUN 23 TO JUL 5 1973
DAYS 174 THRU 186

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY, ASCENDING NODE 24
FROM JUL 5 TO JUL 17 1973
DAYS 186 THRU 198

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 25
FROM JUL 17 TO JUL 29 1973
DAYS 198 THRU 210

SATellite AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 29 TO AUG 10 1973

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM
IMP 7 TRAJECTORY. ASCENDING NODE 26
FROM JUL 29 TO AUG 10 1973
DAYS 210 THRU 222

SATellite AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 27

FROM AUG 10 TO AUG 22 1973
DAYS 222 THRU 234

SATellite AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 28
FROM AUG 22 TO SEP 3 1973
DAYS 234 THRU 246

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research, 03/14/88
IMP 7 FROM SEP 3 TO SEP 15 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 29
FROM SEP 3 TO SEP 15 1973
DAYS 246 THRU 258

SATTELITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM SEP 15 TO SEP 27 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.
ASCENDING NODE 30
FROM SEP 15 TO SEP 27 1973
DAYS 258 THRU 270

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJEKTORY. ASCENDING NODE 31

FROM SEP 27 TO OCT 10 1973

DAYS 270 THRU 283

SATrELITE AND MOON ORBITS

$\sqrt{YSE^2 + ZSE^2}$

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 32
FROM OCT 10 TO OCT 22 1973
DAYS 283 THRU 295
SATELLITE AND MOON ORBITS
\( \Delta = 0000 \text{ UT} \)
VIEW FROM NORTH
VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 33
FROM OCT 22 TO NOV 3 1973
DAYS 295 THRU 307

SATELLITE AND MOON ORBITS

\[ \sqrt{YSE^2 + ZSE^2} \]

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 3 TO NOV 14 1973

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM

YGSM
IMP 7 TRAJECTORY, ASCENDING NODE 34
FROM NOV 3 TO NOV 14 1973
DAYS 307 THRU 318

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 35
FROM NOV 14 TO NOV 27 1973
DAYS 318 THRU 331

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 27 TO DEC 9 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 36
FROM NOV 27 TO DEC 9 1973
DAYS 331 THRU 343
SATELLITE AND MOON ORBITS
$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research 03/14/88
CSRAIMP90
IMP 7 FROM DEC 9 TO DEC 21 1973

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 37
FROM DEC 9 TO DEC 21 1973
DAYS 343 THRU 355

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 21 TO JAN 2 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 38
FROM DEC 21 TO JAN 2 1974
DAYS 355 THRU 2

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research 03/14/88
CSR1MP90
IMP 7 FROM JAN 2 TO JAN 14 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 39
FROM JAN 2 TO JAN 14 1974
DAYS 2 THRU 14

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM JAN 14 TO JAN 26 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 40
FROM JAN 14 TO JAN 26 1974
DAYS 14 THRU 26

SATIRE AND MOON ORBITS

\( (YSE^2 + ZSE^2)^{1/2} \)

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 26 TO FEB 7 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 41

FROM JAN 26 TO FEB 7 1974

DAYS 26 THRU 38

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM FEB 7 TO FEB 19 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 42
FROM FEB 7 TO FEB 19 1974
DAYS 38 THRU 50
IMP 7 FROM FEB 19 TO MAR 3 1974
IMP 7 TRAJECTORY. ASCENDING NODE 43
FROM FEB 19 TO MAR 3 1974
DAYS 50 THRU 62

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 3 TO MAR 15 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 44
FROM MAR 3 TO MAR 15 1974
DAYS 62 THRU 74

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

\( \text{XSE} \)
\( \text{YSE} \)

VIEW FROM SUN

\( \text{ZSE} \)
\( \text{YSE} \)
IMP 7 TRAJECTORY. ASCENDING NODE 45
FROM MAR 15 TO MAR 27 1974
DAYS 74 THRU 86

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 27 TO APR 8 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 46
FROM MAR 27 TO APR 8 1974
DAYS 86 THRU 98

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM APR 8 TO APR 21 1974

VIEW FROM NORTH

VIEW FROM SUN

C - J
IMP 7 TRAJECTORY.  ASCENDING NODE 47
FROM APR 8 TO APR 21 1974
DAYS 98 THRU 111

SATellite AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research
IMP 7 FROM APR 21 TO MAY 3 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 48
FROM APR 21 TO MAY 3 1974
DAYS 111 THRU 123

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 3 TO MAY 15 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 49

FROM MAY 3 TO MAY 15 1974

DAYS 123 THRU 135

SATellite AND moon ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 15 TO MAY 27 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 50
FROM MAY 15 TO MAY 27 1974
DAYS 135 THRU 147

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM MAY 27 TO JUN 8 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 51
FROM MAY 27 TO JUN 8 1974
DAYS 147 THRU 159

SATellite AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUN 8 TO JUN 20 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 52
FROM JUN 8 TO JUN 20 1974
DAYS 159 THRU 171

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 53

FROM JUN 20 TO JUL 2 1974

DAYS 171 THRU 183

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 2 TO JUL 14 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 54
FROM JUL 2 TO JUL 14 1974
DAYS 183 THRU 195

SATellite AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 55
FROM JUL 14 TO JUL 26 1974
DAYS 195 THRU 207

SATellite AND MOon ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM JUL 26 TO AUG 8 1974

VIEW FROM NORTH

VIEW FROM SUN

XGSM  YGSM  ZGSM
IMP 7 TRAJECTORY: ASCENDING NODE 56
FROM JUL 26 TO AUG 8 1974
DAYS 207 THRU 220

SATellite AND MoON ORBITS

\[ (\text{YSE}^2 + \text{ZSE}^2)^{1/2} \]

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM AUG 8 TO AUG 20 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 57
FROM AUG 8 TO AUG 20 1974
DAYS 220 THRU 232

SATellite AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM AUG 20 TO SEP 1 1974
IMP 7 TRAJECTORY. ASCENDING NODE 58

FROM AUG 20 TO SEP 1 1974
DAYS 232 THRU 244

SATellite and Moon ORBITS

△ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 59
FROM SEP 1 TO SEP 13 1974
DAYS 244 THRU 256

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM SEP 13 TO SEP 25 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 60

FROM SEP 13 TO SEP 25 1974
DAYS 256 THRU 268

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM SEP 25 TO OCT 7 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 61
FROM SEP 25 TO OCT 7 1974
DAYS 268 THRU 280

SATELLITE AND MOON ORBITS

△ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 62
FROM OCT 7 TO OCT 19 1974
DAYS 280 THRU 292

SATELLITE AND MOON ORBITS

\( (yse^2 + zse^2)^{1/2} \)

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 63
FROM OCT 19 TO OCT 31 1974
DAYS 292 THRU 304

SATELLITE AND MOON ORBITS

(\text{YSE}^2+\text{ZSE}^2)^{1/2}

XSE

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 64
FROM OCT 31 TO NOV 12 1974
DAYS 304 THRU 316

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 12 TO NOV 25 1974
IMP 7 TRAJECTORY. ASCENDING NODE 65
FROM NOV 12 TO NOV 25 1974
DAYS 316 THRU 329

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 25 TO DEC 7 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 66
FROM NOV 25 TO DEC 7 1974
DAYS 329 THRU 341

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 7 TO DEC 19 1974

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY, ASCENDING NODE 67
FROM DEC 7 TO DEC 19 1974
DAYS 341 THRU 353

SATellite AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 19 TO JAN 1 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 68
FROM DEC 19 TO JAN 1 1975
DAYS 353 THRU 1

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 1 TO JAN 13 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJEKTORY: ASCENDING NODE 69
FROM JAN 1 TO JAN 13 1975
DAYS 1 THRU 13

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH
VIEW FROM SUN
IMP 7 FROM JAN 13 TO JAN 25 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 70
FROM JAN 13 TO JAN 25 1975
DAYS 13 THRU 25

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 25 TO FEB 6 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 71

FROM JAN 25 TO FEB 6 1975

DAYS 25 THRU 37

SATELLITE AND MOON ORBITS

△ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 72
FROM FEB 6 TO FEB 18 1975
DAYS 37 THRU 49

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM FEB 18 TO MAR 2 1975

VIEW FROM NORTH

VIEW FROM SUN

YCSM vs. XCSM

ZCSM vs. YCSM
IMP 7 TRAJECTORY. ASCENDING NODE 73
FROM FEB 18 TO MAR 2 1975
DAYS 49 THRU 61

SATELLITE AND MOON ORBITS

△ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 2 TO MAR 14 1975

VIEW FROM NORTH

XGSM

VIEW FROM SUN

ZCSM

YGSM
IMP 7 TRAJECTORY. ASCENDING NODE 74
FROM MAR 2 TO MAR 14 1975
DAYS 61 THRU 73

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 14 TO MAR 27 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 75
FROM MAR 14 TO MAR 27 1975
DAYS 73 THRU 86

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 27 TO APR 8 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 76
FROM MAR 27 TO APR 8 1975
DAYS 86 THRU 98

SATELLITE AND MOON ORBITS

(\(YSE^2 + ZSE^2\))^{1/2}

\(\Delta = 0000\) UT

VIEW FROM NORTH

VIEW FROM SUN

MIT Center for Space Research
IMP 7 TRAJECTORY. ASCENDING NODE 77

FROM APR 8 TO APR 20 1975

DAYS 98 THRU 106

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM APR 20 TO MAY 2, 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 78
FROM APR 20 TO MAY 2 1975
DAYS 110 THRU 122

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 2 TO MAY 14 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 79
FROM MAY 2 TO MAY 14 1975
DAYS 122 THRU 134

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 14 TO MAY 26 1975
IMP 7 Trajectory: Ascending Node 80

From May 14 to May 26, 1975
Days 134 thru 146

Satellite and Moon Orbits

$\Delta = 0000$ UT

View from North

View from Sun
IMP 7 TRAJECTORY
ASCENDING NODE 81
FROM MAY 26 TO JUN 7 1975
DAYS 146 THRU 158

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUN 7 TO JUN 19 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 82
FROM JUN 7 TO JUN 19 1975
DAYS 158 THRU 170

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUN 19 TO JUL 2 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 83
FROM JUN 19 TO JUL 2 1975
DAYS 170 THRU 183

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 TRAJECTORY.  ASCENDING NODE 84
FROM JUL 2 TO JUL 14 1975
DAYS 183 THRU 195

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 14 TO JUL 27 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 85
FROM JUL 14 TO JUL 27 1975
DAYS 195 THRU 208

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 27 TO AUG 8 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 86
FROM JUL 27 TO AUG 8 1975
DAYS 208 THRU 220
IMP 7 FROM AUG 8 TO AUG 20 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 87
FROM AUG 8 TO AUG 20 1975
DAYS 220 THRU 232

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM AUG 20 TO SEP 1 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 88
FROM AUG 20 TO SEP 1 1975
DAYS 232 THRU 244

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN

\[ \Delta = 0000 \text{ UT} \]
IMP 7 TRAJECTORY. ASCENDING NODE 89
FROM SEP 1 TO SEP 13 1975
DAYS 244 THRU 256

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM SEP 13 TO SEP 25 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 Trajectory, Ascending Node 90

From Sep 13 to Sep 25 1975
Days 256 thru 268

Satellite and Moon Orbits

△ = 0000 UT

View from North

View from Sun
IMP 7 FROM SEP 25 TO OCT 7 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 91

FROM SEP 25 TO OCT 7 1975

DAYS 268 THRU 280

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM OCT 7 TO OCT 19 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 92
FROM OCT 7 TO OCT 19 1975
DAYS 280 THRU 292

SATELLITE AND MOON ORBITS

\[\Delta = 0000 \text{ UT}\]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 93
FROM OCT 19 TO NOV 1 1975
DAYS 292 THRU 305

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 1 TO NOV 13 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 94
FROM NOV 1 TO NOV 13 1975
DAYS 305 THRU 317

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 13 TO NOV 25 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY, ASCENDING NODE 95
FROM NOV 13 TO NOV 25 1975
DAYS 317 THRU 329

SATELLITE AND MOON ORBITS

\( (yse^2 + zse^2)^{1/2} \)

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 25 TO DEC 7 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 96
FROM NOV 25 TO DEC 7 1975
DAYS 329 THRU 341
IMP 7 FROM DEC 7 TO DEC 19 1975

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY... ASCENDING NODE 97
FROM DEC 7 TO DEC 19 1975
DAYS 341 THRU 353

SATELLITE AND MOON ORBITS

(\sqrt{YSE^2 + ZSE^2})

\Delta = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 98
FROM DEC 19 TO DEC 31 1975
DAYS 353 THRU 365

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 31 TO JAN 13 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 99

FROM DEC 31 TO JAN 13 1976

DAYS 365 THRU 13

SATellite AND MoON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM SUN

VIEW FROM NORTH

M.I.T. Center For Space Research

CR-TEPAN

03/11/84
IMP 7 FROM JAN 13 TO JAN 25 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 100

FROM JAN 13 TO JAN 25 1976
DAYS 13 THRU 25

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM SUN

VIEW FROM NORTH
IMP 7 FROM JAN 25 TO FEB 6 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 101
FROM JAN 25 TO FEB 6 1976
DAYS 25 THRU 37

SATellite AND MOON ORBITS

\[ \sqrt{YSE^2 + ZSE^2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 102
FROM FEB 6 TO FEB 18 1976
DAYS 37 THRU 49

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM FEB 18 TO MAR 2 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 103
FROM FEB 18 TO MAR 2 1976
DAYS 49 THRU 62

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 2 TO MAR 14 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 104
FROM MAR 2 TO MAR 14 1976
DAYS 62 THRU 74

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 14 TO MAR 26 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 105
FROM MAR 14 TO MAR 26 1976
DAYS 74 THRU 86

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 26 TO APR 7 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 106
FROM MAR 26 TO APR 7 1976
DAYS 86 THRU 98

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 107
FROM APR 7 TO APR 19 1976
DAYS 98 THRU 110

SATellite AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM APR 19 TO MAY 1 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 108

FROM APR 19 TO MAY 1 1976
DAYS 110 THRU 122

SATELLITE AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 109
FROM MAY 1 TO MAY 13 1976
DAYS 122 THRU 134

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.

ASCENDING NODE 110

FROM MAY 13 TO MAY 25, 1976

DAYS 134 THRU 146

SATELLITE AND MOON ORBITS

$\Delta = 0000 \text{ UT}$
IMP 7 FROM MAY 25 TO JUN 7 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 111
FROM MAY 25 TO JUN 7 1976
DAYS 146 THRU 159

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 112
FROM JUN 7 TO JUN 19 1976
DAYS 159 THRU 171

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM JUN 19 TO JUL 1 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 113
FROM JUN 19 TO JUL 1 1976
DAYS 171 THRU 183

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 1 TO JUL 14 1976

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM
IMP 7 TRAJECTORY. ASCENDING NODE 114
FROM JUL 1 TO JUL 14 1976
DAYS 183 THRU 196

SATellite AND Moon ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 14 TO JUL 26 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 115
FROM JUL 14 TO JUL 26 1976
DAYS 196 THRU 208

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

\[ (XSE^2 + ZSE^2)^{1/2} \]

\[ XSE \]

\[ YSE \]

\[ ZSE \]
IMP 7 TRAJECTORY. ASCENDING NODE 116
FROM JUL 26 TO AUG 7 1976
DAYS 208 THRU 220

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

M. I. T. Center for Space Research
IMP 7 FROM AUG 7 TO AUG 19 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 117
FROM AUG 7 TO AUG 19 1976
DAYS 220 THRU 232

SATellite AND MOON ORBITS

△ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM AUG 19 TO AUG 31 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 118
FROM AUG 19 TO AUG 31 1976
DAYS 232 THRU 244

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM AUG 31 TO SEP 12 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP / TRAJECTORY.  ASCENDING NODE 119
FROM AUG 31 TO SEP 12 1976
DAYS 244 THRU 256
SATELLITE AND MOON ORBITS
\[ \Delta = 0000 \text{ UT} \]

**VIEW FROM NORTH**

**VIEW FROM SUN**
IMP 7 FROM SEP 12 TO SEP 24 1976

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YCSM

ZCSM

YCSM
IMP 7 TRAJECTORY. ASCENDING NODE 120

FROM SEP 12 TO SEP 24 1976
DAYS 256 THRU 268

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM SEP 24 TO OCT 7 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 121
FROM SEP 24 TO OCT 7 1976
DAYS 268 THRU 281

SATellite AND MOON ORBITS

`Δ = 0000 UT`

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research
03/14/88
CRIPPS
IMP 7 FROM OCT 7 TO OCT 19 1976

VIEW FROM NORTH

VIEW FROM SUN

MIT Center for Space Research
03/14/90
IMP 7 TRAJECTORY.  ASCENDING NODE 122
FROM OCT 7 TO OCT 19 1976
DAYS 281 THRU 293

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM OCT 19 TO OCT 31 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 123

FROM OCT 19 TO OCT 31 1976
DAYS 293 THRU 305

SATellite AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM OCT 31 TO NOV 12 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 124
FROM OCT 31 TO NOV 12 1976
DAYS 305 THRU 317

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM NOV 12 TO NOV 24 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY
ASCENDING NODE 125
FROM NOV 12 TO NOV 24 1976
DAYS 317 THRU 329

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM NOV 24 TO DEC 6 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 126
FROM NOV 24 TO DEC 6 1976
DAYS 329 THRU 341

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 6 TO DEC 19 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 19 TO DEC 31 1976

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY: ASCENDING NODE 128

FROM DEC 19 TO DEC 31 1976
DAYS 354 THRU 366

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 31 TO JAN 12 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 129

FROM DEC 31 TO JAN 12 1977

DAYS 366 THRU 12

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 12 TO JAN 24 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 130
FROM JAN 12 TO JAN 24 1977
DAYS 12 THRU 24

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 24 TO FEB 5 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 131
FROM JAN 24 TO FEB 5 1977
DAYS 24 THRU 36

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM FEB 5 TO FEB 18 1977

VIEW FROM NORTH

VIEW FROM SUN

XGSM

ZGSM

YGSM
IMP 7 TRAJECTORY. ASCENDING NODE 132
FROM FEB 5 TO FEB 18 1977
DAYS 36 THRU 49

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM FEB 18 TO MAR 2 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 133
FROM FEB 18 TO MAR 2 1977
DAYS 49 THRU 61

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 2 TO MAR 14 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 134
FROM MAR 2 TO MAR 14 1977
DAYS 61 THRU 73

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 14 TO MAR 26 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 135
FROM MAR 14 TO MAR 26 1977
DAYS 73 THRU 85

SATELLITE AND MOON ORBITS

$\Delta = 0000 \text{ UT}$

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAR 26 TO APR 7 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 136
FROM MAR 26 TO APR 7 1977
DAYS 85 THRU 97

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM APR 7 TO APR 19 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 137

FROM APR 7 TO APR 19 1977
DAYS 97 THRU 109

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

MIT Center for Space Research
03/11/88

CSA 01-88
IMP 7 FROM APR 19 TO MAY 2 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 138
FROM APR 19 TO MAY 2 1977
DAYS 109 THRU 121

SATELLITE AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 2 TO MAY 14 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 139
FROM MAY 2 TO MAY 14 1977
DAYS 122 THRU 134

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 14 TO MAY 26 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 140
FROM MAY 14 TO MAY 26 1977
DAYS 134 THRU 146

SATELLITE AND MOON ORBITS

(\sqrt{YSE^2 + ZSE^2})

\Delta = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN

MIT Center for Space Research

CSL7988
IMP 7 FROM MAY 26 TO JUN 7 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY
ASCENDING NODE 141
FROM MAY 26 TO JUN 7 1977
DAYS 146 THRU 158

SATELLITE AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUN 7 TO JUN 19 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 142

FROM JUN 7 TO JUN 19 1977
DAYS 158 THRU 170

SATellite AND MOON ORBITS

\[ (\text{YSE}^2 + \text{ZSE}^2)^{1/2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUN 19 TO JUL 1 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 143
FROM JUN 19 TO JUL 1 1977
DAYS 170 THRU 182

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 1 TO JUL 14, 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 144
FROM JUL 1 TO JUL 14 1977
DAYS 182 THRU 195

SATELLITE AND MOON ORBITS

Δ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUL 14 TO JUL 26 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 145

FROM JUL 14 TO JUL 26 1977

DAYS 195 THRU 207

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 146
FROM JUL 26 TO AUG 7 1977
DAYS 207 THRU 219

SATellite AND MOON ORBITS

\[ \sqrt{\text{YSE}^2 + \text{ZSE}^2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM AUG 7 TO AUG 19 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 147
FROM AUG 7 TO AUG 19 1977
DAYS 219 THRU 231

SATellite AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM AUG 19 TO AUG 31 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 148
FROM AUG 19 TO AUG 31 1977
DAYS 231 THRU 243
SATellite AND MOON ORBITs

\[ \Delta = 0000 \text{ UT} \]
IMP 7 FROM AUG 31 TO SEP 13 1977
IMP 7 TRAJECTORY.  ASCENDING NODE 149
FROM AUG 31 TO SEP 13 1977
DAYS 243 THRU 256

SATELLITE AND MOON ORBITS

\[ (YSE^2 + ZSE^2)^{1/2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM SEP 13 TO SEP 25 1977

VIEW FROM NORTH

XGSM

YGSM

VIEW FROM SUN

ZGSM

YGSM

XGSM
IMP 7 TRAJECTORY. ASCENDING NODE 150
FROM SEP 13 TO SEP 25 1977
DAYS 256 THRU 268

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

MIT Center for Space Research

02/11/89
IMP 7 TRAJECTORY.  ASCENDING NODE 151
FROM SEP 25 TO OCT 7 1977
DAYS 268 THRU 280

SATellite AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 152
FROM OCT 7 TO OCT 19 1977
DAYS 280 THRU 292

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 153
FROM OCT 19 TO OCT 31 1977
DAYS 292 THRU 304

SATellite AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM OCT 31 TO NOV 12 1977

VIEW FROM NORTH

VIEW FROM SUN

XGSM

YGSM

ZGSM

XGSM

YGSM
IMP 7 TRAJECTORY. ASCENDING NODE 154
FROM OCT 31 TO NOV 12 1977
DAYS 304 THRU 316

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 12 TO NOV 25 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 155
FROM NOV 12 TO NOV 25 1977
DAYS 316 THRU 329

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM NOV 25 TO DEC 7 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 156
FROM NOV 25 TO DEC 7, 1977
DAYS 329 THRU 341

SATellite AND MOon ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 7 TO DEC 19 1977

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 157
FROM DEC 7 TO DEC 19 1977
DAYS 341 THRU 353

SATellite AND MOON ORBITS

$\Delta = 0000 \text{ UT}$

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 158

FROM DEC 19 TO DEC 31 1977

DAYS 353 THRU 361

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM DEC 31 TO JAN 12 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 159

FROM DEC 31 TO JAN 12 1978

DAYS 365 THRU 12

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 160
FROM JAN 12 TO JAN 24 1978
DAYS 12 THRU 24

SATELLITE AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JAN 24 TO FEB 6 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 Trajectory. Ascending Node 161

From Jan 24 to Feb 6, 1978

Days 24 thru 37

Satellite and Moon Orbits

\[ \sqrt{YSE^2 + ZSE^2} \]

\[ \triangle = 0000 \text{ UT} \]
IMP 7 FROM FEB 6 TO FEB 18 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 162
FROM FEB 6 TO FEB 18 1978
DAYS 37 THRU 49

SATellite AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM FEB 18 TO MAR 2 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 163
FROM FEB 18 TO MAR 2 1978
DAYS 49 THRU 61

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN

Δ = 0000 UT
IMP 7 TRAJECTORY. ASCENDING NODE 164
FROM MAR 2 TO MAR 14 1978
DAYS 61 THRU 73

SATellite and MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7. TRAJECTORY.  ASCENDING NODE 165
FROM MAR 14 TO MAR 27 1978
DAYS 73 THRU 86

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN

M. J. T. Center for Space Research

CSAMIPan
03/11/84
IMP 7 TRAJECTORY. ASCENDING NODE 166
FROM MAR 27 TO APR 8 1978
DAYS 86 THRU 98

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 167
FROM APR 8 TO APR 20 1978
DAYS 98 THRU 110

SATellite and Moon Orbits

△ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN

MIT Center for Space Research
IMP 7 FROM APR 20 TO MAY 2 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY.  ASCENDING NODE 168
FROM APR 20 TO MAY 2 1978
DAYS 110 THRU 122

SATellite AND MOON ORBITS

$\Delta = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 2 TO MAY 14 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 169
FROM MAY 2 TO MAY 14 1978
DAYS 122 THRU 134

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM MAY 14 TO MAY 26 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 170
FROM MAY 14 TO MAY 26 1978
DAYS 134 THRU 146

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 171
FROM MAY 26 TO JUN 7 1978
DAYS 146 THRU 158

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 172
FROM JUN 7 TO JUN 20 1978
DAYS 158 THRU 171

SATELLITE AND MOON ORBITS

\[ (\text{YSE}^2 + \text{ZSE}^2)^{1/2} \]

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM JUN 20 TO JUL 2 1978

VIEW FROM NORTH

XGSM

VIEW FROM SUN

YGSM
IMP 7 TRAJECTORY. ASCENDING NODE 173

FROM JUN 20 TO JUL 2 1978
DAYS 171 THRU 183
IMP 7 FROM JUL 2 TO JUL 14 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 174
FROM JUL 2 TO JUL 14 1978
DAYS 183 THRU 195

SATELLITE AND MOON ORBITS

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 175

FROM JUL 14 TO JUL 27 1978
DAYS 195 THRU 208

SATELLITE AND MOON ORBITS

$\triangle = 0000$ UT

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY
ASCENDING NODE 176
FROM JUL 27 TO AUG 8 1978
DAYS 208 THRU 220

SATELLITE AND MOON ORBITS

\[ \sqrt{\text{XSE}^2 + \text{ZSE}^2} \]

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 177
FROM AUG 8 TO AUG 20 1978
DAYS 220 THRU 232

SATELLITE AND MOON ORBITS

\( \Delta = 0000 \text{ UT} \)

VIEW FROM NORTH

VIEW FROM SUN

M.I.T. Center for Space Research
03/14/88
IMP 7 FROM AUG 20 TO SEP 1 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 178
FROM AUG 20 TO SEP 1 1978
DAYS 232 THRU 244

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 FROM SEP 1 TO SEP 13 1978

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 179
FROM SEP 1 TO SEP 13 1978
DAYS 244 THRU 256

SATELLITE AND MOON ORBITS

\[ \Delta = 0000 \text{ UT} \]

VIEW FROM NORTH

VIEW FROM SUN
IMP 7 TRAJECTORY. ASCENDING NODE 180
FROM SEP 13 TO SEP 25 1978
DAYS 256 THRU 268

SATELLITE AND MOON ORBITS

△ = 0000 UT

VIEW FROM NORTH

VIEW FROM SUN