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GEGENSCHEIN ORBITAL PARAMETERS AND OPERATIONAL SCHEDULE

67P.

BY

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ABSTRACT

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There are two basic purposes for this document. One is to present and apply a technique for defining the location of the Eccentric Orbiting Geophysical Observatory (EGO), S-49 in the gegenschein reference frame. The gegenschein reference frame is an orthogonal coordinate system with its origin at the center of the earth and its fundamental plane lying in the ecliptic plane with one of the axes in this plane pointing directly away from the sun.

A second purpose for this document is to predict an operational schedule for the gegenschein experiment. The experiment device cannot tolerate direct or reflected sunlight. The gegenschein experiment package is placed on the darkside of the solar array, therefore, direct sunlight is not a problem. However, the earth, moon or appendages of the satellite itself may come into the field of view of the gegenschein experiment. When this occurs the experiment will have to be turned off. A technique for computing when any of these reflecting bodies come into the field of view of the experiment is developed here and applied.

The position of the satellite in the gegenschein coordinate system is a function of the orbit and position of the sun. The field of view problem is a function of the location of the satellite, earth and moon and solar array position; the latter because the gegenschein experiment package rotates with the solar array.

As a result of the application of these techniques, in computer programs, the position in the gegenschein coordinate system versus time of the EGO is presented and also an operational schedule as a function of solar array angle.

Author

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a	Semi-major axis.
a_E	Radius of the earth.
C_E	Position matrix whose elements are the components in the equatorial coordinate system.
C_ϵ	Position matrix whose elements are the components in the ecliptic coordinate system.
C_g	Position matrix whose elements are the components in the gegenschein coordinate system.
e	Eccentricity.
i	Inclination.
$\bar{i}, \bar{j}, \bar{k}$	Orthogonal unit vectors.
$\bar{N}$	Unit normal vector.
$\bar{r}$	Position vector.
T	Transformation matrix.
$\bar{U}$	Unit vector along position vector.
x, y, z	Cartesian coordinates or component along $\bar{i}, \bar{j}, \bar{k}$.
α	Earth angle. The angle between the anti-solar direction and a vector pointing to the earth.
β	Moon angle. The angle between the anti-solar direction and a vector pointing to the moon.
γ	Experiment angle, angle between the normal to the gegenschein and a vector to an experiment.
δ	Angular dimension of earth.
ϵ	Obliquity of the ecliptic.
θ	Angular displacement between ecliptic and gegenschein coordinate systems.
φ	Solar array angle.
Ω	Right ascension of the ascending node.
ω	Argument of perigee.

Subscripts

c	Corrected.
E	Equatorial coordinate system.
g	Gegenschein coordinate system.
i	index, $i = 1,2,3 \ldots n$.
ig	Gegenschein experiment to the i^{th} experiment.
m	Earth to moon.
mv	Vehicle to moon.
s	Earth to sun.
v	Earth to vehicle.
sv	Vehicle to sun.
ϵ	Ecliptic coordinate system.
o	Initial conditions.
1	First transformation.
2	Second transformation.

INTRODUCTION

The gegenschein phenomenon is a faint nebulous light which appears in that part of the sky which is opposite the sun. Hence, it rises when the sun sets and reaches its zenith at midnight. It seems to lie in the plane of the ecliptic and stretches out about 10° on either side of the anti-solar direction. The gegenschein is sometimes referred to as counterglow.

An experiment is planned to make measurements of intensity and location of the gegenschein. Dr. C. L. Wolff and Dr. K. L. Hallam of the Goddard Space Flight Center and Prof. Wyatt of the University of Illinois have a device on the Eccentric Orbiting Geophysical Observatory (EGO, S-49) which will carry out these measurements.

The EGO is the first in the series of Orbiting Geophysical Observatories, the OGO Program. It will have an apogee height in the order of 80,000 nautical miles. The primary objective of the OGO Program is to conduct large numbers of significant, diversified experiments. The EGO will carry twenty experiments, one of which is the gegenschein experiment (Reference 1).

The purpose of this discussion is to show the development of a "gegenschein coordinate system" and a technique for calculating certain angles in space and on the spacecraft.

I. GEGENSCHEIN COORDINATE SYSTEM

Since the gegenschein lies opposite the sun, with respect to the earth, it is convenient to have a coordinate system such that the x-axis points toward the gegenschein. If the position of the satellite is known in this reference frame then measurements of the gegenschein by the satellite will define the position of the gegenschein in space in the gegenschein coordinate system. These measurements can then be transformed into a more conventional reference frame, such as ecliptic or equatorial coordinates.

Consider the sketch below for a simplified representation of the geometry involved with the problem.

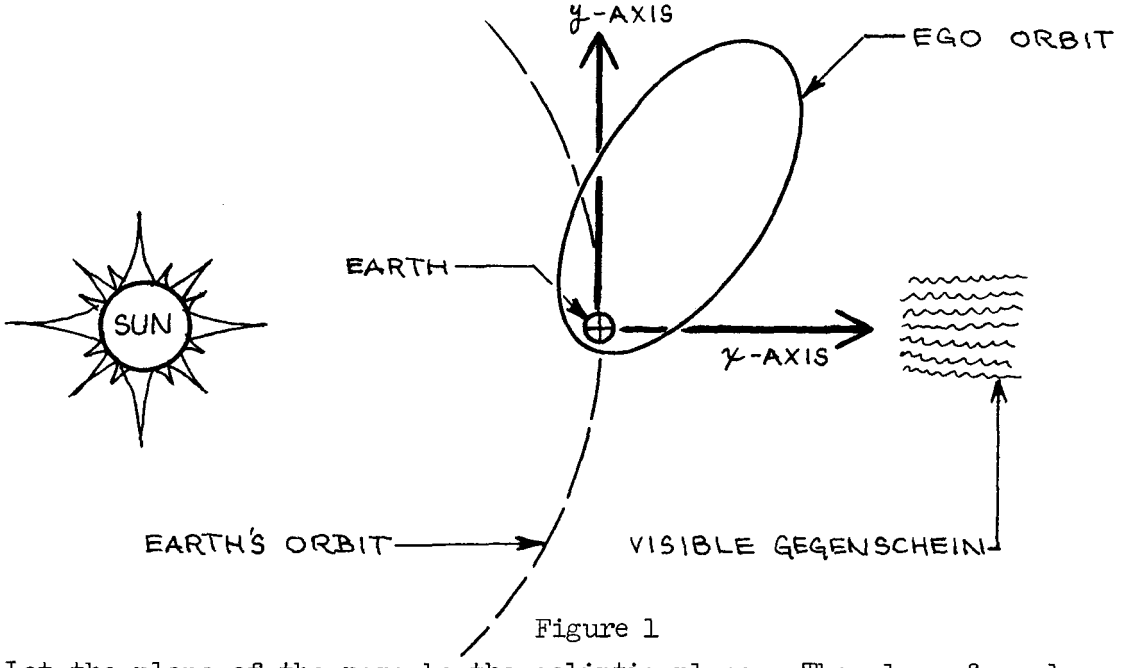


Figure 1

Let the plane of the page be the ecliptic plane. The plane formed by the earth's orbit around the sun is the ecliptic plane. Then the plane formed by the x and y axis in the sketch lies in the ecliptic plane. Consequently, the z-axis of the gegenschein coordinate system

is normal to the ecliptic plane. Since the orbit of the EGO does not lie in the ecliptic plane the satellite will have, in general, a z component in the gegenschein coordinate system.

When the satellite is in orbit the position of the satellite will be known in the equatorial coordinate system. In this case the earth's equator is the fundamental plane. Now, the ecliptic and the equatorial coordinate systems have one axis in common. This is the axis formed by the intersection of the equatorial and ecliptic planes. Since the gegenschein coordinate system and the ecliptic system also have an axis in common (the z-axis) then it is a matter of two rotations to transform from the equatorial coordinates to the gegenschein coordinates, or vice versa.

The transformation is carried out in the following manner.

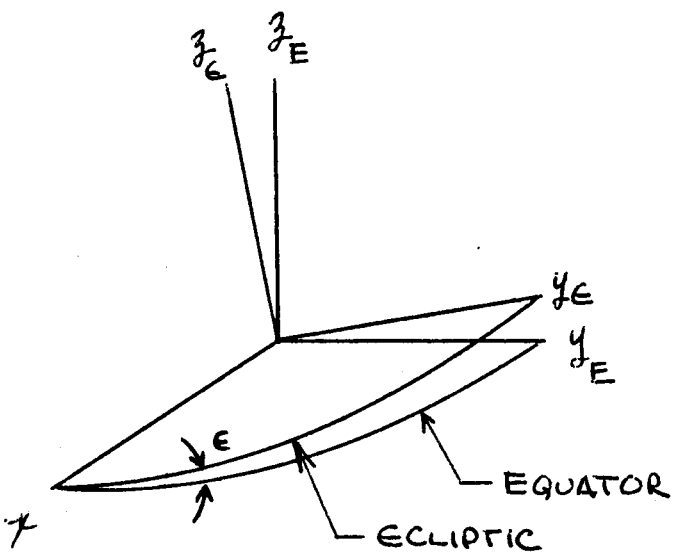


Figure 2

Let x, y_E, z_E = the principal axes in the equatorial system.

x, y_ϵ, z_ϵ = the principal axes in the ecliptic system.

ϵ = the obliquity of the ecliptic.

Consequently, the following relationship between the two systems is written.

$$\begin{bmatrix} x \\ y_E \\ z_E \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\epsilon & -\sin\epsilon \\ 0 & \sin\epsilon & \cos\epsilon \end{bmatrix} \begin{bmatrix} x \\ y_\epsilon \\ z_\epsilon \end{bmatrix}$$

In shorthand matrix notation this is written as:

$$C_E = T_1 C_\epsilon \tag{1}$$

where C_E and C_ϵ are three-vectors representing the position of the satellite in the equatorial and ecliptic respectively. T_1 is the transformation matrix.

The relationship between the ecliptic and gegenschein systems can also be shown in a sketch.

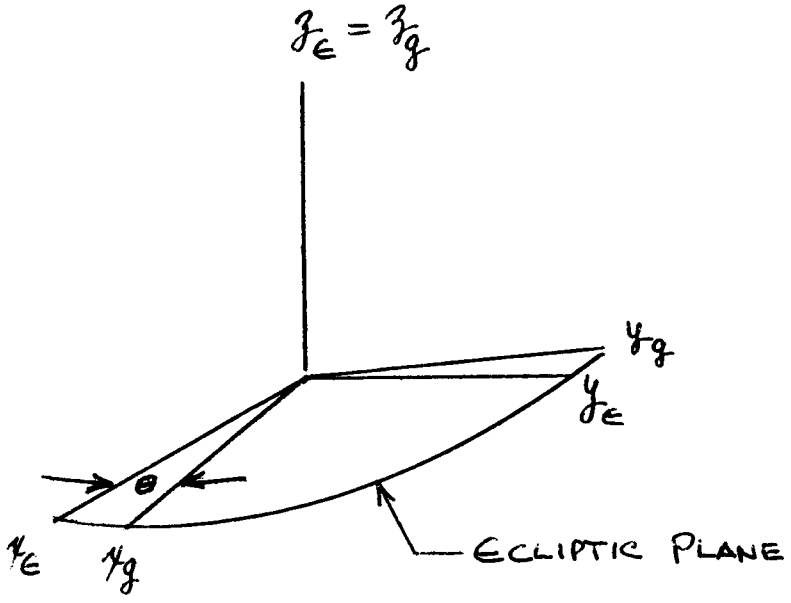


Figure 3

In this case the two systems are related by the following:

$$\begin{bmatrix} x_g \\ y_g \\ z_g \end{bmatrix} = \begin{bmatrix} \cos\theta & \sin\theta & 0 \\ -\sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x_\epsilon \\ y_\epsilon \\ z_\epsilon \end{bmatrix}$$

or more simply as

$$C_g = T_2 C_\epsilon \qquad (2)$$

where C_g = the position of the satellite in the gegenschein coordinate system.

T_2 = the transformation matrix.

Since C_E is known equation (1) can be solved for C_ϵ and substituted in equation (2) to form the following.

$$C_\epsilon = T_1^{-1} C_E = T_1^T C_E \quad \text{because of orthogonality, therefore}$$

$$C_g = T_2 T_1^T C_E$$

Let $T \equiv T_2 T_1^T$

Then $C_g = TC_E$. (3)

In its expanded form equation (3) appears as:

$$\begin{bmatrix} x_g \\ y_g \\ z_g \end{bmatrix} = \begin{bmatrix} \cos\theta & \sin\theta\cos\epsilon & \sin\theta\sin\epsilon \\ -\sin\theta & \cos\theta\cos\epsilon & \cos\theta\sin\epsilon \\ 0 & -\sin\epsilon & \cos\epsilon \end{bmatrix} \begin{bmatrix} x_E \\ y_E \\ z_E \end{bmatrix} \quad (4)$$

As a result of equation (4) the position of the satellite is known in the gegenschein coordinate system.

The value for the obliquity, ϵ can be considered a constant. The mean value of the obliquity is given in the American Ephemeris and Nautical Almanac. For 1964, $\epsilon = 23^{\circ}44397$ (Reference 2.) The value for θ can be determined from the position vector of the sun, $\bar{r}_{s_\epsilon}$ in the ecliptic system.

If $\bar{r}_{s_\epsilon} = (x, y_\epsilon, z_\epsilon)$

$$\text{then } \theta = \tan^{-1}\left(\frac{y_\epsilon}{x}\right) \pm \pi \qquad (5)$$

If the first term of (5) is less than π, then π is added; if the first term is greater than π, then π is subtracted. The first term defines the right ascension of the sun along the ecliptic plane and the addition or subtraction of π defines the anti-solar direction.

II. EARTH AND MOON ANGLES

The gegenschein experiment device is quite sensitive to light intensities because of the nature of the planned observations, and it cannot tolerate direct sunlight, earth albedo or moonlight. Sunlight reflected off of the spacecraft itself or off of any of the boom-mounted experiments may also cause damage to the experiment apparatus. Consequently, it is necessary to know when the sun, earth, moon or any of the boom-mounted experiments will come into the field of view of the gegenschein experiment device. Direct sunlight can be ruled out as a problem because the experiment package is fastened on the dark side of the solar array.

The position of the earth, moon and boom-mounted experiments, however, must be known in order that the gegenschein experiment may be turned off when any of these come into view. The use of a photo-sensitive device is not possible because of weight and reliability considerations.

The earth and moon angles are measured from the satellite and these are defined as the angle between the anti-solar direction and earth or moon respectively. The sketch below illustrates these angles

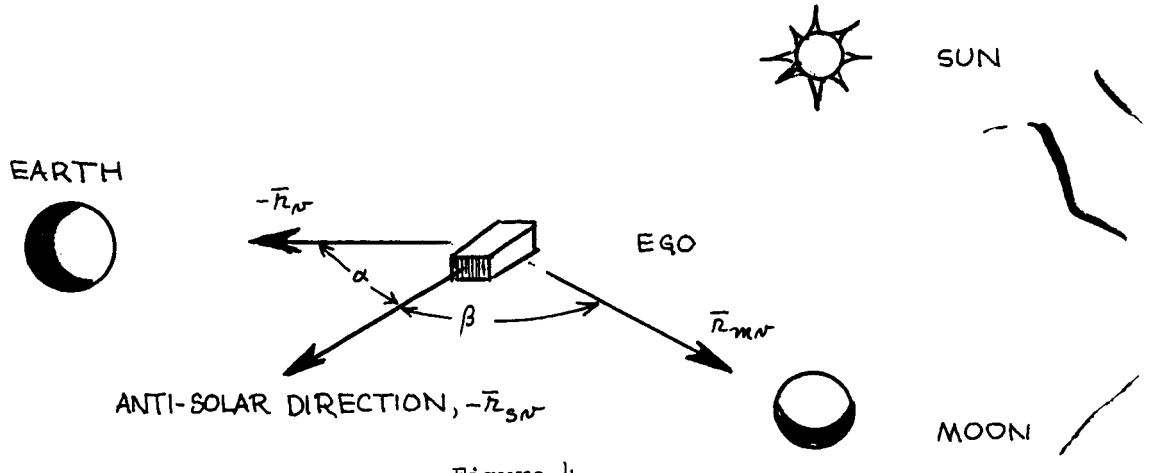


Figure 4

Since the coordinates of the sun, moon and satellite are known in the earth-equatorial system it is a simple matter of vector subtraction to reference the sun and moon from the satellite.

Let: $\bar{r}_v$ = vector from earth to satellite.

$\bar{r}_s$ = vector from earth to sun.

$\bar{r}_m$ = vector from earth to moon.

Then the vector from the satellite to the sun or moon is:

$$\bar{r}_{sv} = \bar{r}_s - \bar{r}_v, \text{ vector from satellite to sun}$$

$$\bar{r}_{mv} = \bar{r}_m - \bar{r}_v, \text{ vector from satellite to moon.}$$

Unit vectors can be formed by:

$$\bar{U}_{sv} = \frac{\bar{r}_{sv}}{|\bar{r}_{sv}|}, \text{ unit vector from satellite to sun.}$$

$$\bar{U}_{mv} = \frac{\bar{r}_{mv}}{|\bar{r}_{mv}|}, \text{ unit vector from satellite to moon.}$$

$$\bar{U}_v = \frac{\bar{r}_v}{|\bar{r}_v|}, \text{ unit vector from earth to satellite.}$$

Consequently, the earth angle, α and the moon angle, β are:

$$\alpha = \cos^{-1} \{\bar{U}_{sv} \cdot \bar{U}_v\} \text{ where } 0^\circ \leq \alpha \leq 180^\circ \qquad (6)$$

$$\beta = \cos^{-1} \{-\bar{U}_{sv} \cdot \bar{U}_{mv}\} \text{ where } 0^\circ \leq \beta \leq 180^\circ \qquad (7)$$

The $-\bar{r}_v$ vector points to the center of the earth. As a result it is possible that a portion of the earth can be in the field of view. This will modify β by the angle δ which is measured between a vector to the center of the earth and one to an edge. See the sketch below.

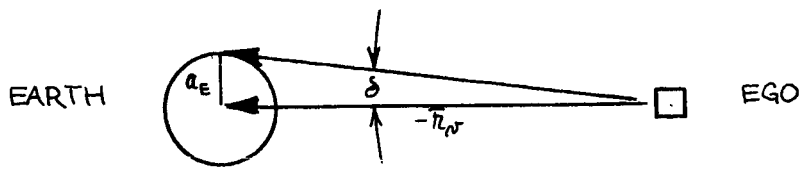


Figure 5

The angle δ is defined by:

$$\delta = \tan^{-1}\left\{\frac{a_E}{|-\bar{r}_v|}\right\} \text{ , where } 0 \leq \delta \leq 90^o$$

where a_E is the radius of the earth

Therefore α_c corrected for the diameter of the earth is:

$$\alpha_c = \alpha - \delta \tag{8}$$

III. SPACECRAFT ANGLES

The angles between the gegenschein experiment device and the boom mounted experiments is done in a manner similar to the earth and moon angles. In this case the origin of the reference frame is the location of the gegenschein experiment package.

Since the location of all the experiments are known in the OGO body coordinate system (Reference 3) it is enough to consider these position coordinates as the components of vectors.

If x_i, y_i, z_i where $i = 1, 2, 3, \ldots n$

n = the number of experiments

are the coordinates of the experiments then

$$\bar{r}_i = \bar{i}x_i + \bar{j}y_i + \bar{k}z_i \tag{9}$$

represents the position vectors of the experiments.

Let $\bar{r}_g$ = the position vector of the gegenschien experiment. Then the position of all the experiments can be referenced from the gegenschein experiment by:

$$\bar{r}_{ig} = \bar{r}_i - \bar{r}_g \cdot \tag{10}$$

It is necessary to take into consideration that the solar array rotates with respect to the main structure of the satellite. Consequently, the position vector $\bar{r}_g$ is a function of the solar array angle, φ. The solar array angle, φ is the angle between the normal to the solar cell side of the solar array and the y-axis in the box coordinate system. See figure 6 on page 18.

Let $\bar{r}_{go}$ = position vector for $\varphi = 0$.

Then the position vector, $r_g(\varphi)$ for any φ is given by: (Reference 3)

$$\bar{r}_g(\varphi) = \begin{bmatrix} x_g \\ y_g \\ z_g \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\varphi & \sin\varphi \\ 0 & \sin\varphi & \cos\varphi \end{bmatrix} \begin{bmatrix} x_{g_o} \\ y_{g_o} \\ z_{g_o} \end{bmatrix} \tag{11}$$

By substituting (11) into (10) the position vectors from the gegenschei experiment of all the experiments is determined for all φ.

The normal to the gegenschein experiment is defined as:

$$\bar{N}_g = (0, -\cos\varphi, \sin\varphi) \tag{12}$$

To find the angles, γ between the gegenschein experiment and the ther experiments it is simply necessary to conduct another dot product.

$$\gamma_i = \cos^{-1}\{\bar{U}_{ig} \cdot \bar{N}_g\} \quad \text{where } 0^o \leq \gamma_i \leq 180^o \tag{13}$$

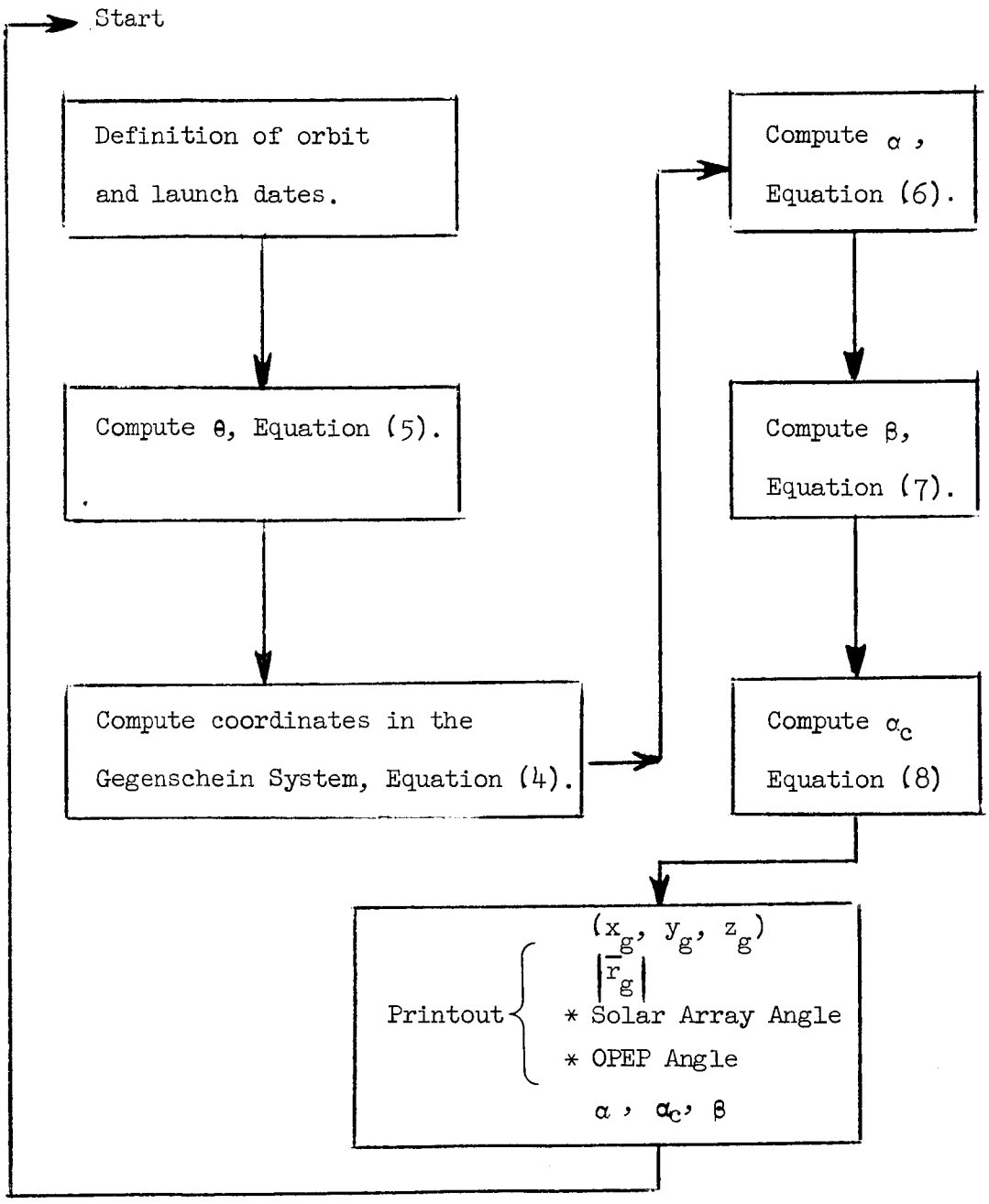
where $\bar{U}_{ig} = \dfrac{\bar{r}_{ig}}{|r_{ig}|}$

IV. COMPUTER PROGRAMS

Two computer programs are involved with the solutions to the equations presented in preceding sections. One is a modified "Shades of EGO" program (Reference 3) and the other was written specifically to solve these problems. The Shades of EGO program is used to compute the gegenschein coordinate system and the earth and moon angles. The Shades of EGO program also computes the solar array angle, the OPEP angle and the distance of the satellite from the earth.

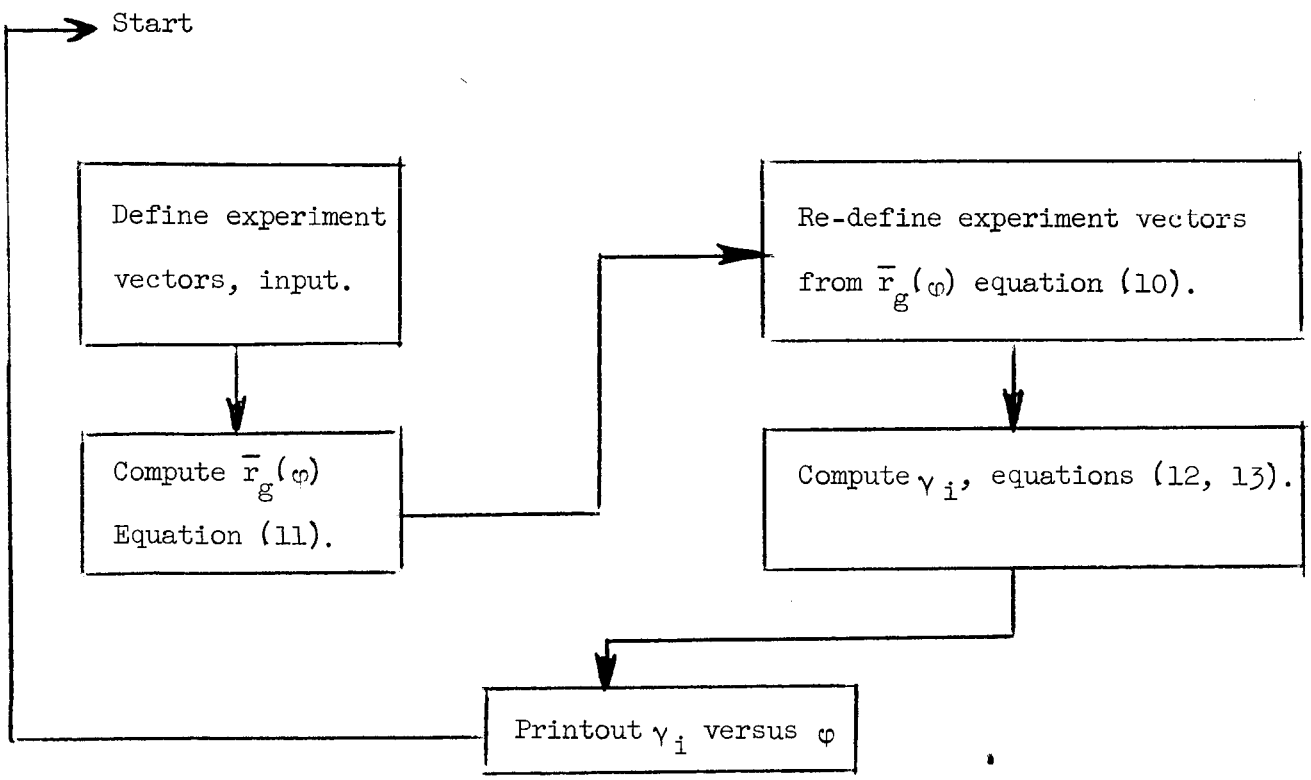
The experiment angles are computed in a separate independent program. Abbreviated flow charts of the logic for the two programs are shown on the next two pages.

MODIFIED SHADES OF EGO PROGRAM



* From main program.

SPACECRAFT ANGLES



The Modified Shades of EGO Program is a numerical integration computer program. It is an adaptation of the ITEM program (Reference 4) which makes use of a modified Encke method of orbit analysis. ITEM is a general purpose interplanetary program. In such a program the orbiting body is "flown" around the orbit in discrete time steps. The Modified Shades of EGO Program is used in conjunction with ephemeris tapes which contain the positions of, among other celestial bodies, the sun and moon. As a result the earth and moon angles are computed. The Shades of EGO Program contains techniques for computing the solar array angle and OPEP angles consequently these are not shown in the flow chart. These, however, are described in Reference 3.

V. THE EGO ORBIT AND EXPERIMENT LOCATIONS

The EGO, S-49 will be placed into a high eccentricity orbit with an apogee about 80,000 nautical miles high. The injection conditions for the EGO are assumed to be the same as the Agena burnout conditions. See Reference 5.

TABLE I

EGO INJECTION CONDITIONS	
Geocentric latitude	$20^{\circ}.744573$ S
Longitude	$111^{\circ}.11923$ E
Height	279.2517 km
Speed	10.716286 km per sec
Azimuth	$66^{\circ}.445986$
Flight Path Angle	$1^{\circ}.452111$

The classical orbital elements associated with these injection conditions are shown below. These elements are the osculating elements taken at approximately apogee with the exception of the right ascension of the ascending node, Ω which is that of injection.

TABLE II

EGO ORBITAL ELEMENTS AT FIRST APOGEE	
a	12.63422 earth radii
e	.91701983
i	31°020115
ω	-46.341238
Ω	138°07048 (injection)
EPOCH	July 25, 1964 3.0 hrs. U.T.

The location of the boom-mounted experiments and the gegenschein experiment are shown in the Table III below. These are given in the box-coordinate system. In this system the center of gravity of the spacecraft is chosen as the origin. The box coordinate system and the solar array angle, φ are shown in the sketch below.

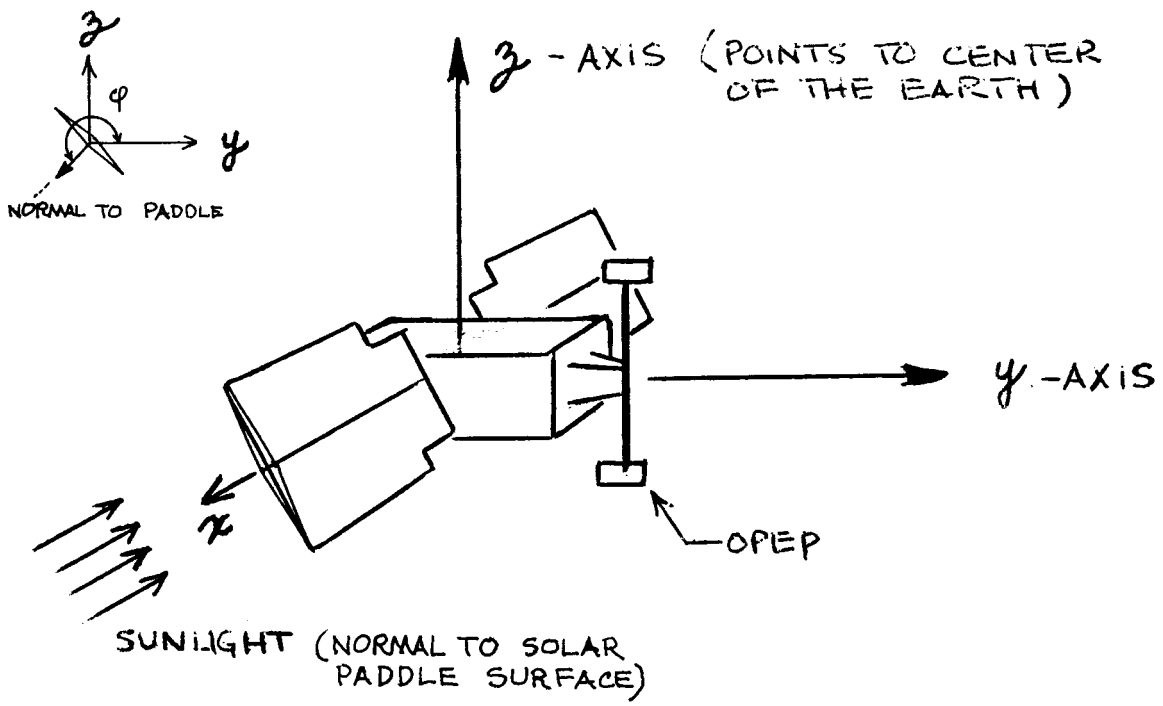


Figure 6

TABLE III

EXPERIMENT COORDINATES			
Experiment No.	x (inches)	y (inches)	z (inches)
E. P. 1	-74.2	91.1	12.3
E. P. 2	49.9	100.1	15.3
E. P. 3	-12.7	103.1	-4.2
E. P. 4	20.6	-94.4	-19.2
E. P. 5 (edge)	67.2	321.0	-25.2
E. P. 6	-6.7	-288.9	-16.7
OPEP 1	-.2	43.1	45.8
OPEP 2	-.2	43.1	-45.8
Gegenschein Exp.	106.9	-1.3	3.0

In the case of E.P. 5 the coordinates of the edge most likely to come into the field of view of the gegenschein experiment are given. The coordinates of the gegenschein are given for the solar array angle, $\varphi = 0$. The coordinates of the gegenschein experiment package for any φ are given by equation (11).

VI. RESULTS AND DISCUSSION

1. Gegenschein Coordinate System

The location of the EGO, S-49 spacecraft in the gegenschein coordinate system as a function of time is determined according to transformations developed in Section I of this document. These data are shown in Appendix A. The launch dates selected for this investigation are chosen in accordance to the launch time restraints imposed on the EGO, S-49. These restraints are discussed in Reference 7. The launch times used for the development of the gegenschein orbital parameters and operation schedule are the following.

Year	Month	Day	Hours (U.T.)
1964	September	4	0100
		4	0400
		9	0100
		9	0330
		14	0100
		14	0300

Results are shown for the first orbit, for an orbit 30 days after launch and finally for an orbit 60 days after launch.

The coordinates in the gegenschein system are a function of flight time and also a function of the date since the position of the sun defines the gegenschein axis system.

2. Earth and Moon Angles

The earth and moon angles (α_c and β) as functions of time are shown in Appendix B. These were computed for the same launch dates as chosen for the gegenschein coordinate system study (see page 20). Results are shown in Appendix B for the earth and moon angles for the first two orbits, for two orbits 30 days after injection and for two orbits 60 days after injection. If either the earth or the moon come into the field of view of the gegenschein experiment the experiment will have to be turned off. The half angle of the field of view of the experiment is approximately 15°. Consequently, "off" time is indicated for the experiment for earth or moon angles of 15° or less.

The earth and moon angles are functions of flight time and date. The moon angle has a greater daily rate of change than the earth angle simply because the moon is orbiting the earth whereas the earth angle's daily rate of change is a function of the earth's orbital position around the sun.

3. Spacecraft Angles

The spacecraft angles, γ_i are directly related to the solar array angle. Consequently, it is sufficient to know the angles between the normal to the gegenschein and the other experiments solely as a function of the solar array angle. If at a certain solar array angle an experiment package comes into the field of view of the gegenschein experiment then, as before, this indicates an "off" time. The actual solar array angle will be known from telemetry when the satellite is in orbit. Predictions of the solar array angles have been made in the launch window analysis for the EGO orbit, Reference 8.

The computer output for the spacecraft angles is shown in Appendix C. The words "NO GO" are printed in front of the solar array angles for which other experiments come into the field of view of the gegenschein. The specific experiment in view in a "NO GO" case is indicated by an asterisk. In the printout shown in Appendix B the half angle of the field of view was chosen as 15°. The half angle is an input quantity, consequently the "NO GO" solar array angles are functions of the field of view. The Appendix C results show that for the 15° half angle field of view criterion the solar array angles between 170° and 198° have the E.P. 5 (edge) experiment coming into the field of view.

APPENDIX A

ORBITAL POSITION OF EGO
in the
GEGENSCHEIN COORDINATE SYSTEM

TABLES FOR APPENDIX A

Orbital Position of EGO in the Gegenschein Coordinate System

Table A-1 First orbit (Injection time, U. T. = $248^d\ 1^h\ 0^m\ 0^s$, 1964).

Table A-2 One orbit (Injection time for A-1 + 30 days flight time).

Table A-3 One orbit (Injection time for A-1 + 60 days flight time).

Table A-4 First orbit (Injection time, U. T. = $248^d\ 4^h\ 0^m\ 0^s$, 1964).

Table A-5 One orbit (Injection time for A-4 + 30 days flight time).

Table A-6 One orbit (Injection time for A-4 + 60 days flight time).

Table A-7 First orbit (Injection time, U. T. = $253^d\ 1^h\ 0^m\ 0^s$, 1964).

Table A-8 One orbit (Injection time for A-7 + 30 days flight time).

Table A-9 One orbit (Injection time for A-7 + 60 days flight time).

Table A-10 First orbit (Injection time, U. T. = $253^d\ 3^h\ 30^m\ 0^s$, 1964).

Table A-11 One orbit (Injection time for A-10 + 30 days flight time).

Table A-12 One orbit (Injection time for A-10 + 60 days flight time).

Table A-13 First orbit (Injection time, U. T. = $258^d\ 1^h\ 0^m\ 0^s$, 1964).

Table A-14 One orbit (Injection time for A-13 + 30 days flight time).

Table A-15 One orbit (Injection time for A-13 + 60 days flight time).

Table A-16 First orbit (Injection time, U. T. = $258^d\ 3^h\ 0^m\ 0^s$, 1964).

Table A-17 One orbit (Injection time for A-16 + 30 days flight time).

Table A-18 One orbit (Injection time for A-16 + 60 days flight time).

TABLE A-1

X,Y,Z AND R FOR FIRST ORBIT
INJECTION AT 1.0 HOURS U.T., SEPTEMBER 4,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
0.0	-0.52773094E 00	0.56103641E 00	-0.70380981E 00	0.10433647E 01
0.5	-0.18402687E 01	-0.69231804E 00	0.95655771E 00	0.21865260E 01
1.0	-0.19975726E 01	-0.17634203E 01	0.23416424E 01	0.35472858E 01
1.5	-0.18983360E 01	-0.26315333E 01	0.34561343E 01	0.47406235E 01
2.0	-0.17043892E 01	-0.33738969E 01	0.44051474E 01	0.58046055E 01
2.5	-0.14655758E 01	-0.40292815E 01	0.52403358E 01	0.67708301E 01
3.0	-0.12029259E 01	-0.46196014E 01	0.59906459E 01	0.76599989E 01
3.5	-0.92699478E 00	-0.51586015E 01	0.66741440E 01	0.84861466E 01
4.0	-0.64369351E 00	-0.56555717E 01	0.73029997E 01	0.92592460E 01
4.5	-0.35658919E-00	-0.61171451E 01	0.78858811E 01	0.99866780E 01
5.0	-0.67953460E-01	-0.65482597E 01	0.84292291E 01	0.10674091E 02
10.0	0.27181005E 01	-0.97478178E 01	0.12421599E 02	0.16021989E 02
15.0	0.51764968E 01	-0.11712585E 02	0.14814706E 02	0.19582040E 02
20.0	0.72823014E 01	-0.12899186E 02	0.16202222E 02	0.21952970E 02
25.0	0.90393236E 01	-0.13485540E 02	0.16817955E 02	0.23375473E 02
30.0	0.10441497E 02	-0.13553765E 02	0.16773020E 02	0.23959625E 02
35.0	0.11466261E 02	-0.13137367E 02	0.16117247E 02	0.23745130E 02
40.0	0.12067445E 02	-0.12235568E 02	0.14858542E 02	0.22718024E 02
45.0	0.12159726E 02	-0.10812956E 02	0.12964196E 02	0.20805031E 02
50.0	0.11578859E 02	-0.87835409E 01	0.10344564E 02	0.17839018E 02
55.0	0.99517661E 01	-0.59556068E 01	0.67952777E 01	0.13441826E 02
56.5	0.91290519E 01	-0.48914909E 01	0.54857779E 01	0.11720069E 02
57.0	0.88027804E 01	-0.45075367E 01	0.50168159E 01	0.11089421E 02
57.5	0.84445766E 01	-0.41068662E 01	0.45295215E 01	0.10425631E 02
58.0	0.80494522E 01	-0.36878625E 01	0.40223052E 01	0.97248623E 01
58.5	0.76108903E 01	-0.32485694E 01	0.34932892E 01	0.89823117E 01
59.0	0.71200934E 01	-0.27865891E 01	0.29402450E 01	0.81918158E 01
59.5	0.65646943E 01	-0.22989477E 01	0.23605423E 01	0.73452386E 01
60.0	0.59263542E 01	-0.17819415E 01	0.17511783E 01	0.64314551E 01
60.5	0.51758086E 01	-0.12310639E 01	0.11091521E 01	0.54345865E 01
61.0	0.42611539E 01	-0.64166500E 00	0.43340815E-00	0.43309363E 01
61.5	0.30737802E 01	-0.14655128E-01	-0.26463236E-00	0.30851854E 01
62.0	0.13166676E 01	0.58480689E 00	-0.87327059E 00	0.16847000E 01
62.5	-0.12029476E 01	0.27052850E-00	-0.23377011E-00	0.12549570E 01
63.0	-0.19996714E 01	-0.95256913E 00	0.14130950E 01	0.26273392E 01
63.5	-0.20920328E 01	-0.19458461E 01	0.26980067E 01	0.39296512E 01
64.0	-0.19938308E 01	-0.27752373E 01	0.37541904E 01	0.50765391E 01
64.5	-0.18158050E 01	-0.34971528E 01	0.46645382E 01	0.61061561E 01
65.0	-0.15970553E 01	-0.41418178E 01	0.54715533E 01	0.70457885E 01

TABLE A-2
X,Y,Z AND R FOR ONE ORBIT AFTER 30 DAYS
INJECTION AT 1.0 HOURS U.T., SEPTEMBER 4,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
30 DAYS + 0.0	0.40025696E 01	-0.17152596E 02	0.15906774E 02	0.23733048E 02
5.0	0.49828541E 01	-0.16716776E 02	0.14669088E 02	0.22791700E 02
10.0	0.57567707E 01	-0.15578515E 02	0.12810158E 02	0.20974524E 02
15.0	0.62235823E 01	-0.13591933E 02	0.10252495E 02	0.18126976E 02
20.0	0.61595833E 01	-0.10434011E 02	0.68193283E 01	0.13903679E 02
23.0	0.56127223E 01	-0.76481829E 01	0.41751296E 01	0.10364798E 02
23.5	0.54525810E 01	-0.70823472E 01	0.36761430E 01	0.96645904E 01
24.0	0.52626488E 01	-0.64772129E 01	0.31568646E 01	0.89227547E 01
24.5	0.50360595E 01	-0.58263647E 01	0.26154454E 01	0.81332019E 01
25.0	0.47629650E 01	-0.51211528E 01	0.20498197E 01	0.72879216E 01
25.5	0.44284167E 01	-0.43494035E 01	0.14578722E 01	0.63760157E 01
26.0	0.40078856E 01	-0.34930228E 01	0.83814417E 00	0.53820851E 01
26.5	0.34562933E 01	-0.25231273E 01	0.19263401E-00	0.42836016E 01
27.0	0.26746053E 01	-0.13898019E 01	-0.45971533E-00	0.30489999E 01
27.5	0.13693540E 01	-0.20644840E-01	-0.98139735E 00	0.16848434E 01
28.0	-0.94391504E 00	0.87117155E 00	-0.24573797E-00	0.13077854E 01
28.5	-0.22146729E 01	0.20964582E-00	0.14010559E 01	0.26290083E 01
29.0	-0.27704214E 01	-0.61083781E 00	0.26938786E 01	0.39122039E 01
29.5	-0.30773731E 01	-0.13868007E 01	0.37557587E 01	0.50496697E 01
30.0	-0.32609346E 01	-0.21096149E 01	0.46694633E 01	0.60735539E 01
30.5	-0.33707504E 01	-0.27854288E 01	0.54780629E 01	0.70092613E 01
31.0	-0.34315148E 01	-0.34208168E 01	0.62067723E 01	0.78740907E 01
31.5	-0.34573290E 01	-0.40212063E 01	0.68717965E 01	0.86801389E 01
32.0	-0.34570213E 01	-0.45909106E 01	0.74842703E 01	0.94361939E 01
32.5	-0.34364955E 01	-0.51333705E 01	0.80522413E 01	0.10148871E 02
33.0	-0.33998999E 01	-0.56513657E 01	0.85817564E 01	0.10823298E 02
35.0	-0.31434592E 01	-0.75189347E 01	0.10395925E 02	0.13209503E 02
40.0	-0.21269695E 01	-0.11154923E 02	0.13525170E 02	0.17660309E 02
45.0	-0.91652079E 00	-0.13762075E 02	0.15383124E 02	0.20660958E 02
50.0	0.33552124E-00	-0.15591058E 02	0.16357371E 02	0.22599939E 02
55.0	0.15642495E 01	-0.16751230E 02	0.16618992E 02	0.23648287E 02
60.0	0.27285086E 01	-0.17285623E 02	0.16250587E 02	0.23881355E 02
65.0	0.37910236E 01	-0.17192440E 02	0.15284595E 02	0.23314602E 02

TABLE A-3

X,Y,Z AND R FOR ONE ORBIT AFTER 60 DAYS
INJECTION AT 1.0 HOURS U.T., SEPTEMBER 4,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
60 DAYS + 0.0	-0.61944531E 01	-0.48891515E 01	0.10181702E 02	0.12881851E 02
5.0	-0.71002931E 01	-0.86770058E 01	0.13349589E 02	0.17433190E 02
10.0	-0.73263329E 01	-0.11631122E 02	0.15209451E 02	0.20500866E 02
15.0	-0.71382093E 01	-0.13906518E 02	0.16174135E 02	0.22493286E 02
20.0	-0.66484378E 01	-0.15572044E 02	0.16423801E 02	0.23588801E 02
25.0	-0.59147934E 01	-0.16648087E 02	0.16045979E 02	0.23866650E 02
30.0	-0.49693591E 01	-0.17116919E 02	0.15076947E 02	0.23345188E 02
35.0	-0.38301521E 01	-0.16918220E 02	0.13514186E 02	0.21989303E 02
40.0	-0.25075872E 01	-0.15926252E 02	0.11313285E 02	0.19695784E 02
45.0	-0.10130056E 01	-0.13881332E 02	0.83646351E 01	0.16238371E 02
50.0	0.60225963E 00	-0.10130284E 02	0.44124455E 01	0.11065941E 02
50.5	0.76223217E 00	-0.96002685E 01	0.39419273E 01	0.10406005E 02
51.0	0.91920054E 00	-0.90278356E 01	0.34539810E 01	0.97096203E 01
51.5	0.10715429E 01	-0.84062479E 01	0.29472397E 01	0.89721473E 01
51.5	0.10715429E 01	-0.84062479E 01	0.29472397E 01	0.89721473E 01
52.0	0.12168721E 01	-0.77265625E 01	0.24201757E 01	0.81876612E 01
52.5	0.13515026E 01	-0.69764752E 01	0.18711712E 01	0.73484043E 01
53.0	0.14693983E 01	-0.61382145E 01	0.12987580E 01	0.64438792E 01
53.5	0.15598167E 01	-0.51844095E 01	0.70244059E 00	0.54593545E 01
54.0	0.16011650E 01	-0.40689404E 01	0.85655972E-01	0.43734817E 01
54.5	0.15407262E 01	-0.27033042E 01	-0.53115164E 00	0.31565507E 01
55.0	0.11958684E 01	-0.89051444E 00	-0.10221282E 01	0.18077233E 01
55.5	-0.16522358E-00	0.11718229E 01	-0.38541450E-00	0.12445931E 01
56.0	-0.16271053E 01	0.13875525E 01	0.13058972E 01	0.25056219E 01
56.5	-0.25453229E 01	0.98963819E 00	0.26361773E 01	0.37957191E 01
57.0	-0.32182969E 01	0.48339636E-00	0.37187748E 01	0.49416994E 01
57.5	-0.37547314E 01	-0.45995206E-01	0.46446504E 01	0.59726795E 01
58.0	-0.42022038E 01	-0.57499835E 00	0.54605172E 01	0.69142163E 01
58.5	-0.45860147E 01	-0.10954132E 01	0.61933883E 01	0.77839270E 01
59.0	-0.49213940E 01	-0.16041581E 01	0.68604591E 01	0.85941456E 01
59.5	-0.52183123E 01	-0.21001618E 01	0.74734657E 01	0.93538308E 01
60.0	-0.54837053E 01	-0.25832187E 01	0.80408445E 01	0.10069717E 02
60.5	-0.57226190E 01	-0.30535144E 01	0.85689057E 01	0.10747021E 02
65.0	-0.71111202E 01	-0.67788158E 01	0.12115790E 02	0.15598485E 02

TABLE A-4

X,Y,Z AND R FOR FIRST ORBIT
INJECTION AT 4.0 HOURS U.T., SEPTEMBER 4,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
0.0	-0.91178069E 00	-0.48987430E-01	-0.50484281E 00	0.10433647E 01
0.5	-0.62716033E 00	-0.15040171E 01	0.14579081E 01	0.21865255E 01
1.0	0.29458846E-00	-0.21421788E 01	0.28120296E 01	0.35472838E 01
1.5	0.12012543E 01	-0.25172961E 01	0.38332350E 01	0.47406203E 01
2.0	0.20534030E 01	-0.27698306E 01	0.46695816E 01	0.58046031E 01
2.5	0.28533150E 01	-0.29505758E 01	0.53848718E 01	0.67708306E 01
3.0	0.36073008E 01	-0.30837539E 01	0.60127804E 01	0.76600056E 01
3.5	0.43211735E 01	-0.31828999E 01	0.65735511E 01	0.84861631E 01
4.0	0.49997200E 01	-0.32563930E 01	0.70804590E 01	0.92592761E 01
4.5	0.56468204E 01	-0.33098036E 01	0.75427682E 01	0.99867277E 01
5.0	0.62656298E 01	-0.33470365E 01	0.79672477E 01	0.10674165E 02
10.0	0.11310720E 02	-0.32280560E 01	0.10879959E 02	0.16022678E 02
15.0	0.14932675E 02	-0.27001415E 01	0.12380046E 02	0.19584204E 02
20.0	0.17553991E 02	-0.20059255E 01	0.13037387E 02	0.21957681E 02
25.0	0.19349184E 02	-0.12301578E 01	0.13073142E 02	0.23383996E 02
30.0	0.20393759E 02	-0.41568523E-00	0.12595532E 02	0.23973435E 02
35.0	0.20705067E 02	0.40914336E-00	0.11659958E 02	0.23765980E 02
40.0	0.20251299E 02	0.12185775E 01	0.10289583E 02	0.22748089E 02
45.0	0.18940648E 02	0.19808704E 01	0.84814877E 01	0.20847245E 02
50.0	0.16579178E 02	0.26422139E 01	0.62037539E 01	0.17897961E 02
55.0	0.12730870E 02	0.30767091E 01	0.33812831E 01	0.13526799E 02
57.5	0.99174870E 01	0.30971790E 01	0.17250671E 01	0.10532090E 02
58.0	0.92444627E 01	0.30701073E 01	0.13720026E 01	0.98370746E 01
58.5	0.85229319E 01	0.30273863E 01	0.10117892E 01	0.91010523E 01
59.0	0.77448676E 01	0.29650630E 01	0.64494342E 00	0.83180841E 01
59.5	0.68994186E 01	0.28774301E 01	0.27261835E-00	0.74803677E 01
60.0	0.59712566E 01	0.27557662E 01	-0.10273308E-00	0.65772872E 01
60.5	0.49374432E 01	0.25856781E 01	-0.47576034E-00	0.55937845E 01
61.0	0.37608257E 01	0.23406158E 01	-0.83372147E 00	0.45074809E 01
61.5	0.23743396E 01	0.19621629E 01	-0.11403760E 01	0.32845132E 01
62.0	0.64587098E 00	0.12741823E 01	-0.12470822E 01	0.18962868E 01
62.5	-0.10517330E 01	-0.33351319E-00	-0.16969515E-00	0.11163197E 01
63.0	-0.56847517E 00	-0.16075323E 01	0.17159630E 01	0.24190604E 01
63.5	0.33231641E-00	-0.22223162E 01	0.30010163E 01	0.37490295E 01
64.0	0.12143973E 01	-0.26096969E 01	0.39869027E 01	0.49173846E 01
64.5	0.20469429E 01	-0.28839295E 01	0.48010191E 01	0.59629530E 01
65.0	0.28314479E 01	-0.30894233E 01	0.55004825E 01	0.69149794E 01

TABLE A-5

X,Y,Z AND R FOR ONE ORBIT AFTER 30 DAYS

INJECTION AT 4.0 HOURS U.T., SEPTEMBER 4,1964

TIME AFTER INJECTION (HRS)		X	Y	Z	R
30 DAYS +	0.0	0.18589907E 02	-0.94475766E 01	0.11420251E 02	0.23775270E 02
	5.0	0.18731767E 02	-0.85984749E 01	0.10078485E 02	0.22943163E 02
	10.0	0.18103690E 02	-0.73915078E 01	0.83190668E 01	0.21250526E 02
	15.0	0.16533750E 02	-0.57904583E 01	0.61254448E 01	0.18558431E 02
	20.0	0.13648634E 02	-0.37165270E 01	0.34514555E 01	0.14560574E 02
	23.5	0.10345490E 02	-0.18991808E 01	0.12555733E 01	0.10593041E 02
	24.0	0.97333214E 01	-0.16087066E 01	0.91963173E 00	0.99081382E 01
	24.5	0.90713999E 01	-0.13095523E 01	0.57901891E 00	0.91837075E 01
	25.0	0.83511619E 01	-0.10015067E 01	0.23474717E-00	0.84142751E 01
	25.5	0.75609919E 01	-0.68459564E 00	-0.11136719E-00	0.75927380E 01
	26.0	0.66844287E 01	-0.35940614E-00	-0.45597252E-00	0.67095953E 01
	26.5	0.56967628E 01	-0.27889584E-01	-0.79251048E 00	0.57516915E 01
	27.0	0.45578629E 01	0.30433902E-00	-0.11068340E 01	0.47001933E 01
	27.5	0.31948406E 01	0.61993298E 00	-0.13629938E 01	0.35283247E 01
	27.5	0.31948406E 01	0.61993298E 00	-0.13629938E 01	0.35283247E 01
	28.0	0.14551182E 01	0.84917221E 00	-0.14376696E 01	0.22148039E 01
	28.5	-0.78672604E 00	0.53705540E 00	-0.65582685E 00	0.11564926E 01
	29.0	-0.14496140E 01	-0.75990508E 00	0.13119172E 01	0.20976089E 01
	29.5	-0.10354442E 01	-0.17861102E 01	0.27278233E 01	0.34210166E 01
	30.0	-0.45787345E-00	-0.25811772E 01	0.37855728E 01	0.46046373E 01
	30.5	0.14816438E-00	-0.32413304E 01	0.46440487E 01	0.56652769E 01
	31.0	0.75113041E 00	-0.38116577E 01	0.53729632E 01	0.66303593E 01
	31.5	0.13413492E 01	-0.43165911E 01	0.60089943E 01	0.75193210E 01
	32.0	0.19156943E 01	-0.47710088E 01	0.65740719E 01	0.83457073E 01
	32.5	0.24733967E 01	-0.51847456E 01	0.70825060E 01	0.91192746E 01
	33.0	0.30146116E 01	-0.55646984E 01	0.75442341E 01	0.98472949E 01
	33.5	0.35398635E 01	-0.59159285E 01	0.79664905E 01	0.10535359E 02
	35.0	0.50265190E 01	-0.68317484E 01	0.90452883E 01	0.12399835E 02
	40.0	0.91899431E 01	-0.89188580E 01	0.11344641E 02	0.17108535E 02
	45.0	0.12411304E 02	-0.10102238E 02	0.12456183E 02	0.20279354E 02
	50.0	0.14879086E 02	-0.10690669E 02	0.12807558E 02	0.22354220E 02
	55.0	0.16678260E 02	-0.10812697E 02	0.12581204E 02	0.23523722E 02
	60.0	0.17838262E 02	-0.10528813E 02	0.11869920E 02	0.23873720E 02
	65.0	0.18346921E 02	-0.98634568E 01	0.10721800E 02	0.23427639E 02

TABLE A-6

X,Y,Z AND R FOR ONE ORBIT AFTER 60 DAYS
INJECTION AT 4.0 HOURS U.T., SEPTEMBER 4,1964

TIME AFTER INJECTION (HRS)		X	Y	Z	R
60 DAYS +	0.0	0.56071453E 00	-0.75202571E 01	0.84930193E 01	0.11357819E 02
	5.0	0.33333331E 01	-0.11662308E 02	0.11010951E 02	0.16381746E 02
	10.0	0.57146540E 01	-0.14442836E 02	0.12201363E 02	0.19751608E 02
	15.0	0.77104613E 01	-0.16289306E 02	0.12583293E 02	0.21980263E 02
	20.0	0.93338222E 01	-0.17377971E 02	0.12367363E 02	0.23282306E 02
	25.0	0.10583039E 02	-0.17787216E 02	0.11659469E 02	0.23755609E 02
	30.0	0.11437666E 02	-0.17539983E 02	0.10515963E 02	0.23431959E 02
	35.0	0.11851728E 02	-0.16614504E 02	0.89634773E 01	0.22290112E 02
	40.0	0.11737056E 02	-0.14936697E 02	0.70061003E 01	0.20247193E 02
	45.0	0.10918789E 02	-0.12345544E 02	0.46264820E 01	0.17118316E 02
	50.0	0.89820626E 01	-0.84746061E 01	0.17888238E 01	0.12477832E 02
	51.5	0.80292237E 01	-0.69402699E 01	0.84682754E 00	0.10646731E 02
	52.0	0.76512361E 01	-0.63744832E 01	0.52522953E 00	0.99725278E 01
	52.5	0.72351424E 01	-0.57763442E 01	0.20103811E-00	0.92603376E 01
	53.0	0.67739478E 01	-0.51415801E 01	-0.12434127E-00	0.85051557E 01
	53.5	0.62581074E 01	-0.44647229E 01	-0.44858326E-00	0.77005769E 01
	54.0	0.56740212E 01	-0.37385940E 01	-0.76767853E 00	0.68381965E 01
	54.5	0.50011626E 01	-0.29535100E 01	-0.10742689E 01	0.59066828E 01
	55.0	0.42060470E 01	-0.20961471E 01	-0.13535259E 01	0.48904698E 01
	55.5	0.32276419E 01	-0.11487993E 01	-0.15708818E 01	0.37689629E 01
	56.0	0.19358195E 01	-0.99143792E-01	-0.16233841E 01	0.25283597E 01
	56.5	0.55189652E-01	0.87772360E 00	-0.10609955E 01	0.13780987E 01
	57.0	-0.15462725E 01	0.51686473E 00	0.79547938E 00	0.18140824E 01
	57.5	-0.19111896E 01	-0.55101371E 00	0.23545894E 01	0.30822642E 01
	58.0	-0.18974014E 01	-0.15541354E 01	0.34976059E 01	0.42718516E 01
	58.5	-0.17528952E 01	-0.24594416E 01	0.44095746E 01	0.53447023E 01
	59.0	-0.15489894E 01	-0.32843500E 01	0.51747714E 01	0.63217547E 01
	59.5	-0.13140782E 01	-0.40443636E 01	0.58366437E 01	0.72215018E 01
	60.0	-0.10618627E 01	-0.47508556E 01	0.64206584E 01	0.80574831E 01
	60.5	-0.79980744E 00	-0.54121621E 01	0.69431683E 01	0.88396139E 01
	61.0	-0.53232807E 00	-0.60345452E 01	0.74153900E 01	0.95753390E 01
	61.5	-0.26219843E-00	-0.66228268E 01	0.78454018E 01	0.10270390E 02
	65.0	0.16033160E 01	-0.10031980E 02	0.10048538E 02	0.14289310E 02

TABLE A-7

X,Y,Z AND R FOR FIRST ORBIT

INJECTION AT 1.0 HOURS U.T., SEPTEMBER 9,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
0.0	-0.54742792E 00	0.55755804E 00	-0.69142011E 00	0.10433647E 01
0.5	-0.18116743E 01	-0.67238297E 00	0.10230510E 01	0.21865260E 01
1.0	-0.19293528E 01	-0.17295681E 01	0.24226920E 01	0.35472869E 01
1.5	-0.17983881E 01	-0.25878599E 01	0.35415152E 01	0.47406274E 01
2.0	-0.15774992E 01	-0.33225428E 01	0.44906297E 01	0.58046144E 01
2.5	-0.13150220E 01	-0.39716023E 01	0.53236683E 01	0.67708457E 01
3.0	-0.10311475E 01	-0.45565525E 01	0.60704622E 01	0.76600225E 01
3.5	-0.73590912E 00	-0.50909045E 01	0.67495464E 01	0.84861797E 01
4.0	-0.43486650E-00	-0.55837969E 01	0.73733664E 01	0.92592888E 01
4.5	-0.13133776E-00	-0.60417590E 01	0.79507673E 01	0.99867313E 01
5.0	0.17258957E-00	-0.64696532E 01	0.84883082E 01	0.10674154E 02
10.0	0.30702631E 01	-0.96503497E 01	0.12415762E 02	0.16022076E 02
15.0	0.55942684E 01	-0.11609610E 02	0.14743377E 02	0.19581778E 02
20.0	0.77364972E 01	-0.12797870E 02	0.16069824E 02	0.21951723E 02
25.0	0.95073405E 01	-0.13390528E 02	0.16630462E 02	0.23372377E 02
30.0	0.10903837E 02	-0.13468312E 02	0.16537390E 02	0.23953588E 02
35.0	0.11904780E 02	-0.13063804E 02	0.15841494E 02	0.23734778E 02
40.0	0.12464125E 02	-0.12175486E 02	0.14552131E 02	0.22701573E 02
45.0	0.12495400E 02	-0.10767161E 02	0.12638858E 02	0.20779978E 02
50.0	0.11831140E 02	-0.87516183E 01	0.10016026E 02	0.17801333E 02
55.0	0.10089733E 02	-0.59341669E 01	0.64877924E 01	0.13383143E 02
57.5	0.85058028E 01	-0.40864632E 01	0.42482632E 01	0.10348700E 02
58.0	0.80925702E 01	-0.36668922E 01	0.37483774E 01	0.96429312E 01
58.5	0.76345264E 01	-0.32266185E 01	0.32276578E 01	0.88946518E 01
59.0	0.71224996E 01	-0.27631275E 01	0.26840809E 01	0.80974788E 01
59.5	0.65435342E 01	-0.22732802E 01	0.21153202E 01	0.72429428E 01
60.0	0.58782925E 01	-0.17531341E 01	0.15188671E 01	0.63193955E 01
60.5	0.50956284E 01	-0.11978512E 01	0.89264265E 00	0.53100929E 01
61.0	0.41394794E 01	-0.60241167E 00	0.23770731E-00	0.41898322E 01
61.5	0.28895837E 01	0.31517234E-01	-0.42742695E-00	0.29211951E 01
62.0	0.10061507E 01	0.61638664E 00	-0.94199995E 00	0.15098462E 01
62.5	-0.13907463E 01	0.11147556E-00	0.43195279E-01	0.13958753E 01
63.0	-0.19689886E 01	-0.10770468E 01	0.16784345E 01	0.28025147E 01
63.5	-0.19842802E 01	-0.20352060E 01	0.29352664E 01	0.40859785E 01
64.0	-0.18398884E 01	-0.28409852E 01	0.39706092E 01	0.52174824E 01
64.5	-0.16278008E 01	-0.35455595E 01	0.48639504E 01	0.62352819E 01
65.0	-0.13814766E 01	-0.41766581E 01	0.56561346E 01	0.71655292E 01

TABLE A-8

X, Y, Z AND R FOR ONE ORBIT AFTER 30 DAYS
INJECTION AT 1.0 HOURS U.T., SEPTEMBER 9, 1964

TIME AFTER INJECTION (HRS)		X	Y	Z	R
30 DAYS +	0.0	0.44747245E 01	-0.17296133E 02	0.15548775E 02	0.23684252E 02
	5.0	0.53980911E 01	-0.16803685E 02	0.14236145E 02	0.22675340E 02
	10.0	0.60933103E 01	-0.15593144E 02	0.12311117E 02	0.20780717E 02
	15.0	0.64527850E 01	-0.13507808E 02	0.96953662E 01	0.17835342E 02
	20.0	0.62311905E 01	-0.10195936E 02	0.62097380E 01	0.13466465E 02
	22.5	0.56970865E 01	-0.78148534E 01	0.40191776E 01	0.10472941E 02
	23.0	0.55294141E 01	-0.72496157E 01	0.35332187E 01	0.97782913E 01
	23.5	0.53325835E 01	-0.66455345E 01	0.30284325E 01	0.90427306E 01
	24.0	0.51000862E 01	-0.59963936E 01	0.25032470E 01	0.82603788E 01
	24.5	0.48226689E 01	-0.52938486E 01	0.19559547E 01	0.74235252E 01
	25.0	0.44864373E 01	-0.45262344E 01	0.13849115E 01	0.65217250E 01
	25.5	0.40689354E 01	-0.36763519E 01	0.78923064E 00	0.55402783E 01
	26.0	0.35297869E 01	-0.27170040E 01	0.17132045E-00	0.44576740E 01
	26.5	0.27833039E 01	-0.16014734E 01	-0.45186696E-00	0.32427891E 01
	27.0	0.15888637E 01	-0.25325718E-00	-0.97368234E 00	0.18806074E 01
	27.5	-0.63501454E 00	0.87957047E 00	-0.45083401E-00	0.11747931E 01
	28.0	-0.20476584E 01	0.31381613E-00	0.12723878E 01	0.24311224E 01
	28.5	-0.26173442E 01	-0.51952479E 00	0.26213124E 01	0.37405448E 01
	29.0	-0.29149702E 01	-0.13123625E 01	0.37121372E 01	0.48989089E 01
	29.5	-0.30840033E 01	-0.20503315E 01	0.46421877E 01	0.59384207E 01
	30.0	-0.31782603E 01	-0.27394655E 01	0.54603114E 01	0.68862914E 01
	30.5	-0.32236941E 01	-0.33866884E 01	0.61944047E 01	0.77609608E 01
	31.0	-0.32348259E 01	-0.39977352E 01	0.68620896E 01	0.85752118E 01
	31.5	-0.32206139E 01	-0.45771541E 01	0.74753332E 01	0.93382706E 01
	32.0	-0.31869825E 01	-0.51285583E 01	0.80427057E 01	0.10057041E 02
	32.5	-0.31380553E 01	-0.56548575E 01	0.85706008E 01	0.10736852E 02
	35.0	-0.27466090E 01	-0.79803619E 01	0.10759424E 02	0.13674620E 02
	40.0	-0.16314837E 01	-0.11544005E 02	0.13680825E 02	0.17974726E 02
	45.0	-0.37946957E-00	-0.14101194E 02	0.15385685E 02	0.20873595E 02
	50.0	0.88191424E 00	-0.15886616E 02	0.16233880E 02	0.22731063E 02
	55.0	0.20963429E 01	-0.17003159E 02	0.16386941E 02	0.23707254E 02
	60.0	0.32262634E 01	-0.17489830E 02	0.15923180E 02	0.23871543E 02
	65.0	0.42355630E 01	-0.17341094E 02	0.14872868E 02	0.23234795E 02

TABLE A-9

X,Y,Z AND R FOR ONE ORBIT AFTER 60 DAYS

INJECTION AT 1.0 HOURS U.T., SEPTEMBER 9,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
60 DAYS + 0.0	-0.35630535E-00	-0.79328727E 01	0.88933453E 01	0.11922625E 02
5.0	0.18085188E 01	-0.12197914E 02	0.11343943E 02	0.16755443E 02
10.0	0.37713427E 01	-0.15137640E 02	0.12524856E 02	0.20006079E 02
15.0	0.54833461E 01	-0.17134536E 02	0.12908541E 02	0.22142490E 02
20.0	0.69317741E 01	-0.18350320E 02	0.12692611E 02	0.23364206E 02
25.0	0.81022561E 01	-0.18855063E 02	0.11977074E 02	0.23761529E 02
30.0	0.89691505E 01	-0.18663820E 02	0.10814270E 02	0.23360913E 02
35.0	0.94867743E 01	-0.17744253E 02	0.92268313E 01	0.22135758E 02
40.0	0.95724607E 01	-0.16004822E 02	0.72135159E 01	0.19995528E 02
45.0	0.90625098E 01	-0.13249809E 02	0.47482693E 01	0.16740149E 02
50.0	0.75536589E 01	-0.90214170E 01	0.17791448E 01	0.11899961E 02
51.0	0.70435180E 01	-0.79075551E 01	0.11215417E 01	0.10648870E 02
51.5	0.67472833E 01	-0.73029783E 01	0.78563348E 00	0.99737927E 01
52.0	0.64175248E 01	-0.66614468E 01	0.44582112E-00	0.92605752E 01
52.5	0.60478359E 01	-0.59777854E 01	0.10328088E-00	0.85041698E 01
53.0	0.56294108E 01	-0.52452739E 01	-0.23997396E-00	0.76981005E 01
53.0	0.56294108E 01	-0.52452739E 01	-0.23997396E-00	0.76981005E 01
53.5	0.51495960E 01	-0.44549249E 01	-0.58036962E 00	0.68338513E 01
54.0	0.45890972E 01	-0.35942741E 01	-0.91118645E 00	0.58999050E 01
54.5	0.39159894E 01	-0.26453498E 01	-0.12185817E 01	0.48803473E 01
55.0	0.30708481E 01	-0.15816987E 01	-0.14695675E 01	0.37538657E 01
55.5	0.19220403E 01	-0.37159447E-00	-0.15632465E 01	0.25052068E 01
56.0	0.15625728E-00	0.84850324E 00	-0.10391671E 01	0.13506452E 01
56.5	-0.14932160E 01	0.68124636E 00	0.81020496E 00	0.18303613E 01
57.0	-0.19969870E 01	-0.32084206E-00	0.23621844E 01	0.31097928E 01
57.5	-0.21213952E 01	-0.13031006E 01	0.35074120E 01	0.43012007E 01
58.0	-0.21039915E 01	-0.22062667E 01	0.44257800E 01	0.53741903E 01
58.5	-0.20168895E 01	-0.30387332E 01	0.51993041E 01	0.63509452E 01
59.0	-0.18900916E 01	-0.38120266E 01	0.58704624E 01	0.72502635E 01
59.5	-0.17386592E 01	-0.45354591E 01	0.64642521E 01	0.80857825E 01
60.0	-0.15711146E 01	-0.52161747E 01	0.69967744E 01	0.88674534E 01
60.5	-0.13926965E 01	-0.58596878E 01	0.74790988E 01	0.96027321E 01
61.0	-0.12068226E 01	-0.64703292E 01	0.79192174E 01	0.10297358E 02
65.0	0.36764741E-00	-0.10483953E 02	0.10430560E 02	0.14793412E 02

TABLE A-10

X,Y,Z AND R FOR FIRST ORBIT

INJECTION AT 3.5 HOURS U.T., SEPTEMBER 9,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
0.0	-0.90170101E 00	0.67842925E-01	-0.52052145E 00	0.10433647E 01
0.5	-0.83649115E 00	-0.14189299E 01	0.14379900E 01	0.21865257E 01
1.0	-0.26079874E-01	-0.21729669E 01	0.28037057E 01	0.35472850E 01
1.5	0.80823030E 00	-0.26628620E 01	0.38378937E 01	0.47406221E 01
2.0	0.16070925E 01	-0.30235820E 01	0.46870709E 01	0.58046040E 01
2.5	0.23652724E 01	-0.33060501E 01	0.54147616E 01	0.67708288E 01
3.0	0.30853985E 01	-0.35352184E 01	0.60545952E 01	0.76599984E 01
3.5	0.37711821E 01	-0.37253226E 01	0.66268288E 01	0.84861476E 01
4.0	0.44260868E 01	-0.38853277E 01	0.71447659E 01	0.92592490E 01
4.5	0.50530983E 01	-0.40212824E 01	0.76177000E 01	0.99866844E 01
5.0	0.56547386E 01	-0.41374841E 01	0.80524298E 01	0.10674103E 02
10.0	0.10622180E 02	-0.46630456E 01	0.11051435E 02	0.16022138E 02
15.0	0.14253608E 02	-0.45980359E 01	0.12616247E 02	0.19582568E 02
20.0	0.16927547E 02	-0.42383809E 01	0.13322219E 02	0.21954208E 02
25.0	0.18802459E 02	-0.36909555E 01	0.13392798E 02	0.23377824E 02
30.0	0.19945805E 02	-0.30081920E 01	0.12937076E 02	0.23963561E 02
35.0	0.20370010E 02	-0.22209010E 01	0.12010403E 02	0.23751199E 02
40.0	0.20039535E 02	-0.13508067E 01	0.10635015E 02	0.22726882E 02
45.0	0.18858702E 02	-0.41830468E-00	0.88058925E 01	0.20817525E 02
50.0	0.16627481E 02	0.54693373E 00	0.64868938E 01	0.17856428E 02
55.0	0.12894561E 02	0.14729890E 01	0.35935375E 01	0.13466734E 02
57.5	0.10117832E 02	0.18500173E 01	0.18837563E 01	0.10456654E 02
58.0	0.94480708E 01	0.19077754E 01	0.15177406E 01	0.97575194E 01
58.5	0.87275595E 01	0.19557331E 01	0.11436161E 01	0.90168200E 01
59.0	0.79475676E 01	0.19908267E 01	0.76177438E 00	0.82284578E 01
59.5	0.70961867E 01	0.20085060E 01	0.37322573E-00	0.73843928E 01
60.0	0.61563979E 01	0.20016004E 01	-0.19715402E-01	0.64736409E 01
60.5	0.51023416E 01	0.19578332E 01	-0.41173580E-00	0.54805590E 01
61.0	0.38911865E 01	0.18534947E 01	-0.78961964E 00	0.43818117E 01
61.5	0.24428700E 01	0.16329498E 01	-0.11138280E 01	0.31424118E 01
62.0	0.59078857E 00	0.11094577E 01	-0.12087765E 01	0.17438658E 01
62.5	-0.11438231E 01	-0.39218156E-00	0.35038082E-01	0.12096964E 01
63.0	-0.72220667E 00	-0.16338781E 01	0.18461386E 01	0.25689235E 01
63.5	0.78116739E-01	-0.23312959E 01	0.30996478E 01	0.38792859E 01
64.0	0.88362830E 00	-0.28165272E 01	0.40755561E 01	0.50322740E 01
64.5	0.16561437E 01	-0.31884716E 01	0.48879719E 01	0.60664183E 01
65.0	0.23918524E 01	-0.34884168E 01	0.55896434E 01	0.70095736E 01

TABLE A-11

X,Y,Z AND R FOR ONE ORBIT AFTER 30 DAYS
INJECTION AT 3.5 HOURS U.T., SEPTEMBER 9,1964

TIME AFTER INJECTION (HRS)		X	Y	Z	R
30 DAYS +	0.0	0.17037251E 02	-0.11632065E 02	0.11744969E 02	0.23738516E 02
	5.0	0.17283123E 02	-0.10783108E 02	0.10386583E 02	0.22866195E 02
	10.0	0.16811299E 02	-0.94811092E 01	0.85933497E 01	0.21127159E 02
	15.0	0.15449529E 02	-0.76667262E 01	0.63434809E 01	0.18376789E 02
	20.0	0.12820563E 02	-0.52107915E 01	0.35805371E 01	0.14294735E 02
	23.5	0.97053184E 01	-0.29571550E 01	0.12915788E 01	0.10227714E 02
	24.0	0.91163164E 01	-0.25855806E 01	0.93952241E 00	0.95223501E 01
	24.5	0.84748331E 01	-0.21986442E 01	0.58209323E 00	0.87747172E 01
	25.0	0.77708855E 01	-0.17950153E 01	0.22045653E-00	0.79785550E 01
	25.5	0.69905660E 01	-0.13732664E 01	-0.14317892E-00	0.71256138E 01
	26.0	0.61134732E 01	-0.93208617E 00	-0.50449217E 00	0.62046636E 01
	26.5	0.51075252E 01	-0.47105414E-00	-0.85441332E 00	0.51998776E 01
	27.0	0.39170456E 01	0.63875243E-02	-0.11714020E 01	0.40884557E 01
	27.5	0.24307085E 01	0.47849640E-00	-0.13916640E 01	0.28414840E 01
	28.0	0.40291778E-00	0.79142442E 00	-0.12263367E 01	0.15141324E 01
	28.5	-0.14392807E 01	0.20831108E-01	0.40206545E-00	0.14945298E 01
	29.0	-0.14816459E 01	-0.11768344E 01	0.20898575E 01	0.28191698E 01
	29.5	-0.10917390E 01	-0.21224470E 01	0.32949170E 01	0.40685567E 01
	30.0	-0.60851433E 00	-0.29071555E 01	0.42463323E 01	0.51820055E 01
	30.5	-0.10108811E-00	-0.35863008E 01	0.50422437E 01	0.61883757E 01
	31.0	0.40892674E-00	-0.41895789E 01	0.57306889E 01	0.71105967E 01
	31.5	0.91322052E 00	-0.47347356E 01	0.63390043E 01	0.79645883E 01
	32.0	0.14082948E 01	-0.52333265E 01	0.68844251E 01	0.87616384E 01
	32.5	0.18926744E 01	-0.56933680E 01	0.73786291E 01	0.95100379E 01
	33.0	0.23658162E 01	-0.61206914E 01	0.78299561E 01	0.10216073E 02
	33.5	0.28276347E 01	-0.65196996E 01	0.82446109E 01	0.10884650E 02
	35.0	0.41470443E 01	-0.75777567E 01	0.93114093E 01	0.12701288E 02
	40.0	0.79196592E 01	-0.10093561E 02	0.11617354E 02	0.17307914E 02
	45.0	0.10907105E 02	-0.11622683E 02	0.12752308E 02	0.20412572E 02
	50.0	0.13242412E 02	-0.12478200E 02	0.13124885E 02	0.22435006E 02
	55.0	0.14986605E 02	-0.12792742E 02	0.12911969E 02	0.23557834E 02
	60.0	0.16157070E 02	-0.12627364E 02	0.12203543E 02	0.23862684E 02
	65.0	0.16735489E 02	-0.12003060E 02	0.11045315E 02	0.23369832E 02

TABLE A-12

X,Y,Z AND R FOR ONE ORBIT AFTER 60 DAYS
INJECTION AT 3.5 HOURS U.T., SEPTEMBER 9,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
60 DAYS + 0.0	-0.61876211E 01	-0.58812281E 01	0.10907388E 02	0.13850870E 02
5.0	-0.68958845E 01	-0.95616222E 01	0.13712776E 02	0.18083641E 02
10.0	-0.70207286E 01	-0.12421586E 02	0.15321666E 02	0.20936568E 02
15.0	-0.67757827E 01	-0.14602742E 02	0.16085245E 02	0.22757117E 02
20.0	-0.62558199E 01	-0.16166729E 02	0.16162372E 02	0.23700647E 02
25.0	-0.55104082E 01	-0.17128247E 02	0.15630526E 02	0.23833899E 02
30.0	-0.45671481E 01	-0.17463072E 02	0.14520067E 02	0.23165708E 02
35.0	-0.34414132E 01	-0.17101093E 02	0.12823975E 02	0.21650521E 02
40.0	-0.21423361E 01	-0.15898251E 02	0.10492856E 02	0.19168829E 02
45.0	-0.68276983E 00	-0.13550956E 02	0.74082787E 01	0.15458886E 02
49.5	0.71398885E 00	-0.98168328E 01	0.37638913E 01	0.10537877E 02
50.0	0.86488370E 00	-0.92425192E 01	0.32901260E 01	0.98487112E 01
50.5	0.10116518E 01	-0.86199953E 01	0.27992080E 01	0.91193927E 01
51.0	0.11521631E 01	-0.79407550E 01	0.22899148E 01	0.83442661E 01
51.5	0.12831637E 01	-0.71931882E 01	0.17610183E 01	0.75159597E 01
52.0	0.13993926E 01	-0.63607096E 01	0.12115477E 01	0.66245583E 01
52.5	0.14916565E 01	-0.54181454E 01	0.64157982E 00	0.56562322E 01
53.0	0.15419745E 01	-0.43239420E 01	0.54850541E-01	0.45909876E 01
53.5	0.15083789E 01	-0.30006997E 01	-0.53074094E 00	0.34001604E 01
53.5	0.15083789E 01	-0.30006997E 01	-0.53074094E 00	0.34001604E 01
54.0	0.12570456E 01	-0.12796678E 01	-0.10214021E 01	0.20642131E 01
54.5	0.17498484E-00	0.91357097E 00	-0.65722644E 00	0.11389372E 01
55.0	-0.13628351E 01	0.14068828E 01	0.11019895E 01	0.22474473E 01
55.5	-0.23136810E 01	0.10256131E 01	0.25131617E 01	0.35666488E 01
56.0	-0.29935716E 01	0.50520090E 00	0.36387253E 01	0.47388839E 01
56.5	-0.35288893E 01	-0.43096848E-01	0.45898690E 01	0.57898026E 01
57.0	-0.39722569E 01	-0.59118689E 00	0.54214803E 01	0.67469085E 01
57.5	-0.43508008E 01	-0.11298236E 01	0.61643252E 01	0.76292118E 01
58.0	-0.46805247E 01	-0.16557067E 01	0.68375739E 01	0.84499167E 01
58.5	-0.49717608E 01	-0.21677771E 01	0.74541120E 01	0.92185383E 01
59.0	-0.52316211E 01	-0.26659060E 01	0.80230945E 01	0.99421807E 01
59.5	-0.54652419E 01	-0.31503682E 01	0.85513100E 01	0.10626315E 02
60.0	-0.56764719E 01	-0.36216066E 01	0.90439585E 01	0.11275262E 02
65.0	-0.69985204E 01	-0.77108574E 01	0.12636480E 02	0.16374286E 02

TABLE A-13

X,Y,Z AND R FOR FIRST ORBIT

INJECTION AT 1.0 HOURS U.T., SEPTEMBER 14,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
0.0	-0.56704314E 00	0.55636337E 00	-0.67641104E 00	0.10433647E 01
0.5	-0.17802269E 01	-0.65461830E 00	0.10877321E 01	0.21865255E 01
1.0	-0.18570571E 01	-0.17019439E 01	0.24975900E 01	0.35472849E 01
1.5	-0.16936416E 01	-0.25537606E 01	0.36170971E 01	0.47406229E 01
2.0	-0.14453203E 01	-0.32836502E 01	0.45631301E 01	0.58046073E 01
2.5	-0.11588243E 01	-0.39289485E 01	0.53911696E 01	0.67708360E 01
3.0	-0.85345744E 00	-0.45108491E 01	0.61318528E 01	0.76600109E 01
3.5	-0.53870465E 00	-0.50426792E 01	0.68041320E 01	0.84861668E 01
4.0	-0.21975874E-00	-0.55334614E 01	0.74206959E 01	0.92592772E 01
4.5	0.10032237E-00	-0.59896456E 01	0.79905391E 01	0.99867229E 01
5.0	0.41964473E-00	-0.64160380E 01	0.85203207E 01	0.10674151E 02
10.0	0.34293741E 01	-0.95909524E 01	0.12368000E 02	0.16022309E 02
15.0	0.60193826E 01	-0.11553641E 02	0.14620629E 02	0.19582707E 02
20.0	0.81989446E 01	-0.12750483E 02	0.15880083E 02	0.21953917E 02
25.0	0.99852797E 01	-0.13355321E 02	0.16382623E 02	0.23376501E 02
30.0	0.11378737E 02	-0.13448047E 02	0.16241176E 02	0.23960414E 02
35.0	0.12359727E 02	-0.13060668E 02	0.15507849E 02	0.23745258E 02
40.0	0.12882758E 02	-0.12191185E 02	0.14193988E 02	0.22716948E 02
45.0	0.12861014E 02	-0.10802896E 02	0.12272562E 02	0.20802020E 02
50.0	0.12125748E 02	-0.88079316E 01	0.96643190E 01	0.17832904E 02
55.0	0.10293267E 02	-0.60105012E 01	0.61879611E 01	0.13430127E 02
57.5	0.86565311E 01	-0.41718978E 01	0.40002687E 01	0.10408766E 02
58.0	0.82324895E 01	-0.37539931E 01	0.35143493E 01	0.97065441E 01
58.5	0.77637599E 01	-0.33153057E 01	0.30092825E 01	0.89623100E 01
59.0	0.72413809E 01	-0.28532958E 01	0.24833912E 01	0.81698301E 01
59.5	0.66527615E 01	-0.23647825E 01	0.19348270E 01	0.73208597E 01
60.0	0.59792428E 01	-0.18457404E 01	0.13617621E 01	0.64041000E 01
60.5	0.51910597E 01	-0.12911312E 01	0.76311327E 00	0.54033750E 01
61.0	0.42354158E 01	-0.69534038E 00	0.14137698E-00	0.42944419E 01
61.5	0.30016889E 01	-0.57388756E-01	-0.48383838E-00	0.30409750E 01
62.0	0.11877883E 01	0.55926678E 00	-0.97056480E 00	0.16326716E 01
62.5	-0.12644350E 01	0.23587410E-00	-0.76293735E-01	0.12885081E 01
63.0	-0.19034092E 01	-0.94860742E 00	0.16295034E 01	0.26791984E 01
63.5	-0.19046557E 01	-0.19138356E 01	0.29210407E 01	0.39778083E 01
64.0	-0.17380977E 01	-0.27238763E 01	0.39729226E 01	0.51209959E 01
64.5	-0.15035667E 01	-0.34312682E 01	0.48743007E 01	0.61476110E 01
65.0	-0.12359387E 01	-0.40644587E 01	0.56698203E 01	0.70847887E 01

TABLE A-14

X,Y,Z AND R FOR ONE ORBIT AFTER 30 DAYS
INJECTION AT 1.0 HOURS U.T., SEPTEMBER 14,1964

TIME AFTER INJECTION (HRS)		X	Y	Z	R
30 DAYS +	0.0	0.48236901E 01	-0.17508237E 02	0.15232810E 02	0.23703266E 02
	5.0	0.57145556E 01	-0.17035149E 02	0.13906883E 02	0.22721221E 02
	10.0	0.63654360E 01	-0.15839469E 02	0.11986061E 02	0.20858409E 02
	15.0	0.66698586E 01	-0.13766177E 02	0.94002778E 01	0.17954382E 02
	20.0	0.63874794E 01	-0.10469628E 02	0.59889981E 01	0.13648483E 02
	22.5	0.58291107E 01	-0.81056067E 01	0.38673346E 01	0.10706804E 02
	23.0	0.56587878E 01	-0.75460082E 01	0.33995577E 01	0.10026021E 02
	23.5	0.54608149E 01	-0.69489130E 01	0.29149806E 01	0.93061808E 01
	24.0	0.52293788E 01	-0.63086009E 01	0.24123929E 01	0.85419252E 01
	24.5	0.49563590E 01	-0.56175027E 01	0.18905477E 01	0.77263187E 01
	25.0	0.46298448E 01	-0.48652036E 01	0.13483497E 01	0.68500888E 01
	25.5	0.42311871E 01	-0.40366758E 01	0.78545112E 00	0.59003922E 01
	26.0	0.37283789E 01	-0.31088265E 01	0.20415103E-00	0.48587332E 01
	26.5	0.30583396E 01	-0.20432591E 01	-0.38336787E-00	0.36980156E 01
	27.0	0.20650563E 01	-0.77291466E 00	-0.91686279E 00	0.23879891E 01
	27.5	0.24551537E-00	0.66433205E 00	-0.92693608E 00	0.11665442E 01
	28.0	-0.16628610E 01	0.62899157E 00	0.73498521E 00	0.19237828E 01
	28.5	-0.23858296E 01	-0.19210351E-00	0.22382573E 01	0.32770234E 01
	29.0	-0.27275350E 01	-0.10106430E 01	0.34140350E 01	0.44851401E 01
	29.5	-0.29103573E 01	-0.17754062E 01	0.43961253E 01	0.55631074E 01
	30.0	-0.30067912E 01	-0.24889060E 01	0.52489146E 01	0.65411429E 01
	30.5	-0.30491284E 01	-0.31580074E 01	0.60072988E 01	0.74402845E 01
	31.0	-0.30545523E 01	-0.37888274E 01	0.66925157E 01	0.82749784E 01
	31.5	-0.30333009E 01	-0.43862904E 01	0.73186072E 01	0.90555213E 01
	32.0	-0.29919704E 01	-0.49543135E 01	0.78954285E 01	0.97895301E 01
	32.5	-0.29350623E 01	-0.54960400E 01	0.84302165E 01	0.10482824E 02
	35.0	-0.25047786E 01	-0.78860660E 01	0.10630762E 02	0.13471342E 02
	40.0	-0.13298970E 01	-0.11543378E 02	0.13529210E 02	0.17834172E 02
	45.0	-0.41102678E-01	-0.14169575E 02	0.15193602E 02	0.20775564E 02
	50.0	0.12388489E 01	-0.16009041E 02	0.15999348E 02	0.22667229E 02
	55.0	0.24568434E 01	-0.17168654E 02	0.16113865E 02	0.23673940E 02
	60.0	0.35772817E 01	-0.17689461E 02	0.15619015E 02	0.23867710E 02
	5.0	0.45651874E 01	-0.17567164E 02	0.14548311E 02	0.23261546E 02

TABLE A-15

X,Y,Z AND R FOR ONE ORBIT AFTER 60 DAYS
INJECTION AT 1.0 HOURS U.T., SEPTEMBER 14,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
60 DAYS + 0.0	-0.59336618E 01	-0.58013198E 01	0.10708465E 02	0.13547505E 02
5.0	-0.66540030E 01	-0.96085994E 01	0.13518704E 02	0.17870542E 02
10.0	-0.67895519E 01	-0.12560742E 02	0.15103767E 02	0.20784466E 02
15.0	-0.65591815E 01	-0.14810797E 02	0.15836456E 02	0.22653386E 02
20.0	-0.60584822E 01	-0.16425816E 02	0.15883785E 02	0.23639105E 02
25.0	-0.53370916E 01	-0.17423478E 02	0.15327898E 02	0.23811900E 02
30.0	-0.44226380E 01	-0.17781436E 02	0.14203037E 02	0.23183300E 02
35.0	-0.33306997E 01	-0.17431111E 02	0.12506705E 02	0.21710708E 02
40.0	-0.20708980E 01	-0.16230643E 02	0.10196425E 02	0.19279250E 02
45.0	-0.65673097E 00	-0.13882613E 02	0.71673222E 01	0.15637416E 02
49.5	0.69599464E 00	-0.10169387E 02	0.36319317E 01	0.10820895E 02
50.0	0.84258338E 00	-0.96025866E 01	0.31767382E 01	0.10149447E 02
50.5	0.98555148E 00	-0.89900406E 01	0.27064168E 01	0.94401712E 01
51.0	0.11230890E 01	-0.83242033E 01	0.22200841E 01	0.86880643E 01
51.5	0.12524948E 01	-0.75949676E 01	0.17169200E 01	0.78867033E 01
52.0	0.13695347E 01	-0.67882353E 01	0.11963979E 01	0.70275977E 01
52.5	0.14671105E 01	-0.58833057E 01	0.65890994E 00	0.60991690E 01
53.0	0.15321631E 01	-0.48475377E 01	0.10755786E-00	0.50850480E 01
53.0	0.15321631E 01	-0.48475377E 01	0.10755786E-00	0.50850480E 01
53.5	0.15370379E 01	-0.36241449E 01	-0.44568293E-00	0.39617604E 01
54.0	0.14079034E 01	-0.20997687E 01	-0.95200288E 00	0.27013941E 01
54.5	0.84883682E 00	-0.50090648E-01	-0.11139675E 01	0.14014123E 01
55.0	-0.69697789E 00	0.14348798E 01	0.29921005E-00	0.16230172E 01
55.5	-0.18528553E 01	0.12653235E 01	0.19228552E 01	0.29549092E 01
56.0	-0.26226445E 01	0.77340791E 00	0.31715172E 01	0.41874748E 01
56.5	-0.32066797E 01	0.21924175E-00	0.41984996E 01	0.52875572E 01
57.0	-0.36803620E 01	-0.34424405E-00	0.50813800E 01	0.62836287E 01
57.5	-0.40794419E 01	-0.90122108E 00	0.58610444E 01	0.71976306E 01
58.0	-0.44238889E 01	-0.14461592E 01	0.65617997E 01	0.80448359E 01
58.5	-0.47261176E 01	-0.19771441E 01	0.71994364E 01	0.88361286E 01
59.0	-0.49944405E 01	-0.24937019E 01	0.77848881E 01	0.95795336E 01
59.5	-0.52347357E 01	-0.29959730E 01	0.83261003E 01	0.10281160E 02
60.0	-0.54513361E 01	-0.34843607E 01	0.88290652E 01	0.10945785E 02
65.0	-0.67975207E 01	-0.77137726E 01	0.12452973E 02	0.16148842E 02

TABLE A-16

X,Y,Z AND R FOR FIRST ORBIT
INJECTION AT 3.0 HOURS U.T., SEPTEMBER 14,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
0.0	-0.87658662E 00	0.18192708E-00	-0.53582498E 00	0.10433647E 01
0.5	-0.10337518E 01	-0.13058149E 01	0.14167208E 01	0.21865254E 01
1.0	-0.34906169E-00	-0.21589583E 01	0.27928987E 01	0.35472846E 01
1.5	0.39845276E-00	-0.27522781E 01	0.38392320E 01	0.47406225E 01
2.0	0.11303446E 01	-0.32125515E 01	0.47005630E 01	0.58046067E 01
2.5	0.18338870E 01	-0.35897899E 01	0.54400806E 01	0.67708352E 01
3.0	0.25079506E 01	-0.39091575E 01	0.60913402E 01	0.76600099E 01
3.5	0.31540646E 01	-0.41852930E 01	0.66745941E 01	0.84861656E 01
4.0	0.37743016E 01	-0.44275570E 01	0.72031632E 01	0.92592749E 01
4.5	0.43706959E 01	-0.46423489E 01	0.76863639E 01	0.99867199E 01
5.0	0.49450867E 01	-0.48342645E 01	0.81310160E 01	0.10674147E 02
10.0	0.97524582E 01	-0.59870867E 01	0.11214174E 02	0.16022277E 02
15.0	0.13334090E 02	-0.63830825E 01	0.12842784E 02	0.19582615E 02
20.0	0.16017839E 02	-0.63649257E 01	0.13597186E 02	0.21953745E 02
25.0	0.17943363E 02	-0.60591626E 01	0.13702936E 02	0.23376231E 02
30.0	0.19168952E 02	-0.55265833E 01	0.13269921E 02	0.23960022E 02
35.0	0.19701988E 02	-0.47994265E 01	0.12353423E 02	0.23744681E 02
40.0	0.19503947E 02	-0.38947484E 01	0.10974792E 02	0.22716053E 02
45.0	0.18477148E 02	-0.28205357E 01	0.91270113E 01	0.20800547E 02
50.0	0.16419275E 02	-0.15805227E 01	0.67698950E 01	0.17830370E 02
55.0	0.12872220E 02	-0.18804419E-00	0.38098376E 01	0.13425508E 02
57.5	0.10184138E 02	0.53906581E 00	0.20489609E 01	0.10402186E 02
58.0	0.95301430E 01	0.68154842E 00	0.16704838E 01	0.96994148E 01
58.5	0.88240823E 01	0.82073997E 00	0.12829155E 01	0.89545471E 01
59.0	0.80566677E 01	0.95467372E 00	0.88649743E 00	0.81613219E 01
59.5	0.72151261E 01	0.10802735E 01	0.48205878E-00	0.73114578E 01
60.0	0.62810013E 01	0.11924259E 01	0.71702903E-01	0.63935903E 01
60.5	0.52258265E 01	0.12818518E 01	-0.33944108E-00	0.53914401E 01
61.0	0.40014104E 01	0.13293935E 01	-0.73799231E 00	0.42805612E 01
61.5	0.25143525E 01	0.12860654E 01	-0.10818367E 01	0.30242856E 01
62.0	0.55718157E 00	0.96330696E 00	-0.11682552E 01	0.16134534E 01
62.5	-0.12202917E 01	-0.39806029E-00	0.21887357E-00	0.13021019E 01
63.0	-0.88152200E 00	-0.16138044E 01	0.19747693E 01	0.26983623E 01
63.5	-0.18542334E-00	-0.23771918E 01	0.32059418E 01	0.39954331E 01
64.0	0.53624979E 00	-0.29447447E 01	0.41751269E 01	0.51371947E 01
64.5	0.12398855E 01	-0.34014621E 01	0.49871188E 01	0.61626790E 01
65.0	0.19173433E 01	-0.37850523E 01	0.56914155E 01	0.70989461E 01

TABLE A-17

X,Y,Z AND R FOR ONE ORBIT AFTER 30 DAYS
INJECTION AT 3.0 HOURS U.T., SEPTEMBER 14,1964

TIME AFTER INJECTION (HRS)		X	Y	Z	R
30 DAYS +	0.0	0.15246139E 02	-0.13593006E 02	0.12013749E 02	0.23696935E 02
	5.0	0.15569522E 02	-0.12751336E 02	0.10621716E 02	0.22755822E 02
	10.0	0.15236787E 02	-0.11367858E 02	0.87780814E 01	0.20939021E 02
	15.0	0.14075483E 02	-0.93561295E 01	0.64547664E 01	0.18091998E 02
	20.0	0.11701521E 02	-0.65265250E 01	0.35833386E 01	0.13869443E 02
	23.0	0.92855373E 01	-0.42562893E 01	0.15490599E 01	0.10331349E 02
	23.5	0.87624725E 01	-0.38180024E 01	0.11853401E 01	0.96313600E 01
	24.0	0.81907269E 01	-0.33580161E 01	0.81505221E 00	0.88898023E 01
	24.5	0.75610000E 01	-0.28737593E 01	0.43905640E-00	0.81006162E 01
	25.0	0.68603567E 01	-0.23620552E 01	0.59084415E-01	0.72558451E 01
	25.5	0.60698653E 01	-0.18189708E 01	-0.32136218E-00	0.63446980E 01
	26.0	0.51598466E 01	-0.12398043E 01	-0.69481676E 00	0.53519998E 01
	26.5	0.40790284E 01	-0.62000559E 00	-0.10435336E 01	0.42558010E 01
	27.0	0.27251308E 01	0.37664767E-01	-0.13159921E 01	0.30264817E 01
	27.5	0.85576548E 00	0.65392093E 00	-0.12907353E 01	0.16810547E 01
	28.0	-0.12840624E 01	0.36278282E-00	0.10326946E-00	0.13383169E 01
	28.5	-0.16493027E 01	-0.81818847E 00	0.18873081E 01	0.26365818E 01
	29.0	-0.14278245E 01	-0.18197089E 01	0.31517947E 01	0.39094543E 01
	29.5	-0.10706279E 01	-0.26672869E 01	0.41420094E 01	0.50415181E 01
	30.0	-0.66860109E 00	-0.34098610E 01	0.49672437E 01	0.60619872E 01
	30.5	-0.25094122E-00	-0.40756957E 01	0.56797603E 01	0.69952800E 01
	31.0	0.17038025E-00	-0.46821091E 01	0.63088305E 01	0.78582770E 01
	31.5	0.58974718E 00	-0.52405307E 01	0.68727142E 01	0.86628611E 01
	32.0	0.10043183E 01	-0.57589610E 01	0.73836898E 01	0.94177046E 01
	32.5	0.14126007E 01	-0.62432589E 01	0.78504796E 01	0.10129350E 02
	33.0	0.18138123E 01	-0.66978720E 01	0.82795446E 01	0.10802881E 02
	35.0	0.33430510E 01	-0.82795399E 01	0.97032544E 01	0.13186353E 02
	40.0	0.66608080E 01	-0.11121174E 02	0.11953172E 02	0.17633071E 02
	45.0	0.93530804E 01	-0.12938064E 02	0.13068410E 02	0.20631456E 02
	50.0	0.11501925E 02	-0.14028048E 02	0.13427598E 02	0.22569466E 02
	55.0	0.13145301E 02	-0.14519844E 02	0.13198216E 02	0.23618165E 02
	60.0	0.14288925E 02	-0.14470831E 02	0.12465689E 02	0.23853128E 02
	65.0	0.14908759E 02	-0.13895790E 02	0.11272476E 02	0.23290186E 02

TABLE A-18

X,Y,Z AND R FOR ONE ORBIT AFTER 60 DAYS
INJECTION AT 3.0 HOURS U.T., SEPTEMBER 14,1964

TIME AFTER INJECTION (HRS)	X	Y	Z	R
60 DAYS + 0.0	-0.11548002E 01	-0.86112983E 01	0.95901992E 01	0.12940631E 02
5.0	0.42149007E-00	-0.12799206E 02	0.11831655E 02	0.17435177E 02
10.0	0.19479925E 01	-0.15760831E 02	0.12908881E 02	0.20465524E 02
15.0	0.33463481E 01	-0.17806338E 02	0.13220372E 02	0.22428597E 02
20.0	0.45858871E 01	-0.19070759E 02	0.12941137E 02	0.23498877E 02
25.0	0.56430389E 01	-0.19608980E 02	0.12160856E 02	0.23753787E 02
30.0	0.64887867E 01	-0.19423190E 02	0.10925401E 02	0.23210537E 02
35.0	0.70786619E 01	-0.18465493E 02	0.92518438E 01	0.21832968E 02
40.0	0.73353515E 01	-0.16619526E 02	0.71324687E 01	0.19516355E 02
45.0	0.71030463E 01	-0.13638676E 02	0.45316844E 01	0.16031311E 02
50.0	0.59673658E 01	-0.89157268E 01	0.13841312E 01	0.10817368E 02
50.5	0.57624373E 01	-0.82928014E 01	0.10377941E 01	0.10151514E 02
51.0	0.55304639E 01	-0.76301704E 01	0.68654879E 00	0.94486442E 01
51.5	0.52662076E 01	-0.69222031E 01	0.33130492E-00	0.87039990E 01
52.0	0.49624956E 01	-0.61615799E 01	-0.26342288E-01	0.79115183E 01
52.5	0.46090706E 01	-0.53384769E 01	-0.38353210E-00	0.70632827E 01
53.0	0.41904149E 01	-0.44391847E 01	-0.73489064E 00	0.61486585E 01
53.5	0.36811586E 01	-0.34436330E 01	-0.10695029E 01	0.51529966E 01
53.5	0.36811586E 01	-0.34436330E 01	-0.10695029E 01	0.51529966E 01
54.0	0.30349802E 01	-0.23209108E 01	-0.13621958E 01	0.40562679E 01
54.5	0.21518436E 01	-0.10234509E 01	-0.15409995E 01	0.28377036E 01
55.0	0.76602757E 00	0.45672764E-00	-0.13056755E 01	0.15811979E 01
55.5	-0.10860628E 01	0.10463000E 01	0.29248194E-00	0.15361711E 01
56.0	-0.19173043E 01	0.23314026E-00	0.20031285E 01	0.27826127E 01
56.5	-0.22387175E 01	-0.71241336E 00	0.32453233E 01	0.40064339E 01
57.0	-0.23739634E 01	-0.16094304E 01	0.42268043E 01	0.51080175E 01
57.5	-0.24174286E 01	-0.24470711E 01	0.50467900E 01	0.61075533E 01
58.0	-0.24072803E 01	-0.32312512E 01	0.57549047E 01	0.70253050E 01
58.5	-0.23625080E 01	-0.39689706E 01	0.63795880E 01	0.78761230E 01
59.0	-0.22938737E 01	-0.46662028E 01	0.69388169E 01	0.86707833E 01
59.5	-0.22080435E 01	-0.53277867E 01	0.74447827E 01	0.94173009E 01
60.0	-0.21094176E 01	-0.59576277E 01	0.79061957E 01	0.10121803E 02
60.5	-0.20010486E 01	-0.65589017E 01	0.83295330E 01	0.10789092E 02
65.0	-0.82209936E 00	-0.11007547E 02	0.10998002E 02	0.15581977E 02

APPENDIX B

EARTH AND MOON ANGLES

LIST OF FIGURES FOR APPENDIX B

Figure

B-1 Corrected Earth Angle (Injection time, U.T. = $248^d\ 1^h\ 0^m\ 0^s$, 1964).

B-2 Corrected Earth Angle (Injection time, U.T. = $248^d\ 4^h\ 0^m\ 0^s$, 1964).

B-3 Corrected Earth Angle (Injection time, U.T. = $253^d\ 1^h\ 0^m\ 0^s$, 1964).

B-4 Corrected Earth Angle (Injection time, U.T. = $253^d\ 3^h\ 30^m\ 0^s$, 1964).

B-5 Corrected Earth Angle (Injection time, U.T. = $258^d\ 1^h\ 0^m\ 0^s$, 1964).

B-6 Corrected Earth Angle (Injection time, U.T. = $258^d\ 3^h\ 0^m\ 0^s$, 1964).

B-7 Moon Angle (Injection time, U.T. = $248^d\ 1^h\ 0^m\ 0^s$, 1964).

B-8 Moon Angle (Injection time, U.T. = $248^d\ 4^h\ 0^m\ 0^s$, 1964).

B-9 Moon Angle (Injection time, U.T. = $253^d 1^h\ 0^m\ 0^s$, 1964).

B-10 Moon Angle (Injection time, U.T. = $253^d\ 3^h\ 30^m\ 0^s$, 1964).

B-11 Moon Angle (Injection time, U.T. = $258^d\ 1^h\ 0^m\ 0^s$, 1964).

B-12 Moon Angle (Injection time, U.T. = $258^d\ 3^h\ 0^m\ 0^s$, 1964).

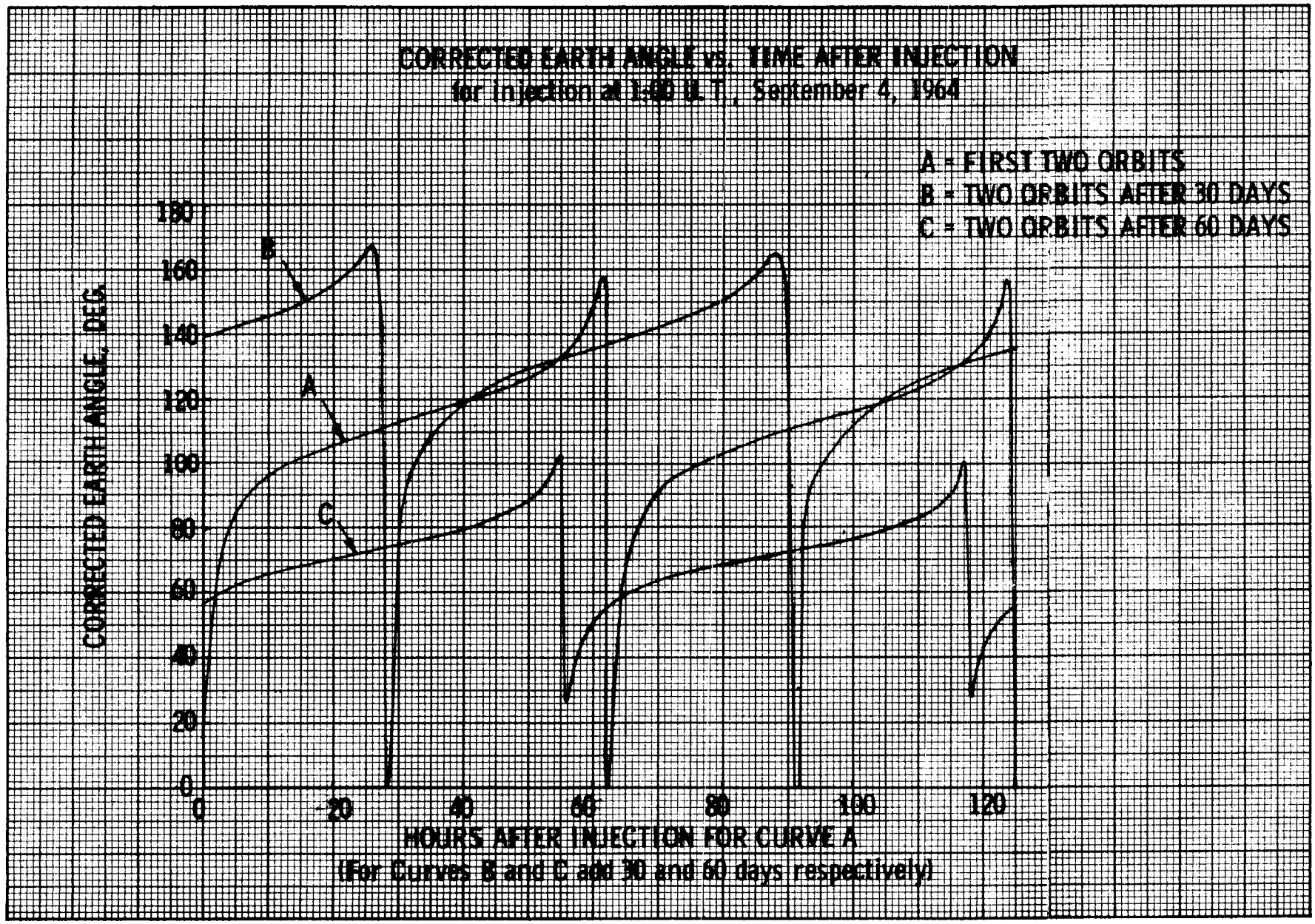

CORRECTED EARTH ANGLE vs. TIME AFTER INJECTION
for injection at 1:00 G.M.T., September 4, 1964
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
CORRECTED EARTH ANGLE, DEG.
180
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-1

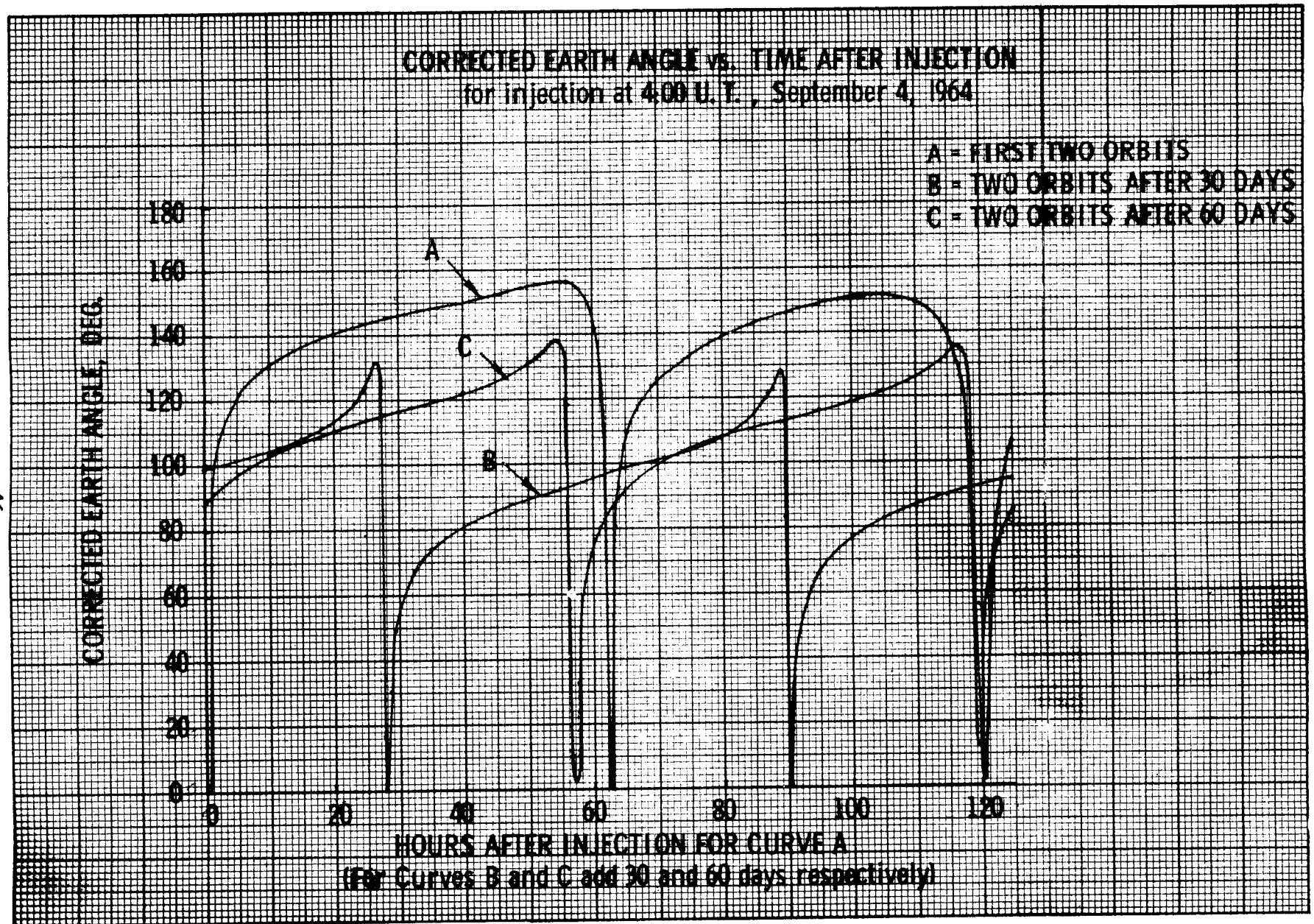

CORRECTED EARTH ANGLE vs. TIME AFTER INJECTION
for injection at 4:00 U.T., September 4, 1964
A - FIRST TWO ORBITS
B - TWO ORBITS AFTER 30 DAYS
C - TWO ORBITS AFTER 60 DAYS
CORRECTED EARTH ANGLE, DEG.
180
160
140
120
100
80
60
40
20
0
A
B
C
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-2

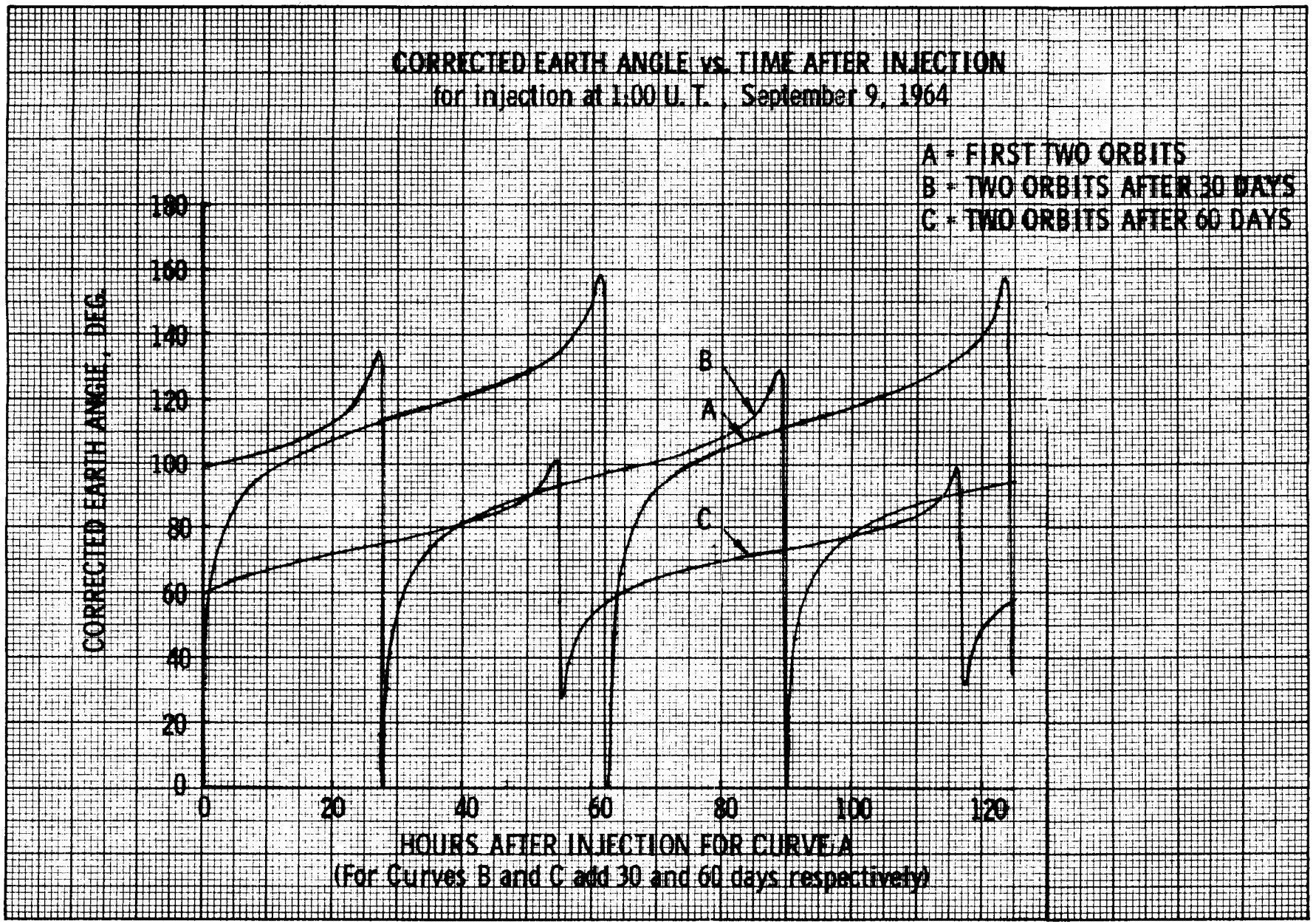

CORRECTED EARTH ANGLE vs. TIME AFTER INJECTION
for injection at 1:00 U.T., September 9, 1964
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
CORRECTED EARTH ANGLE, DEG.
180
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120
A
B
C
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-3

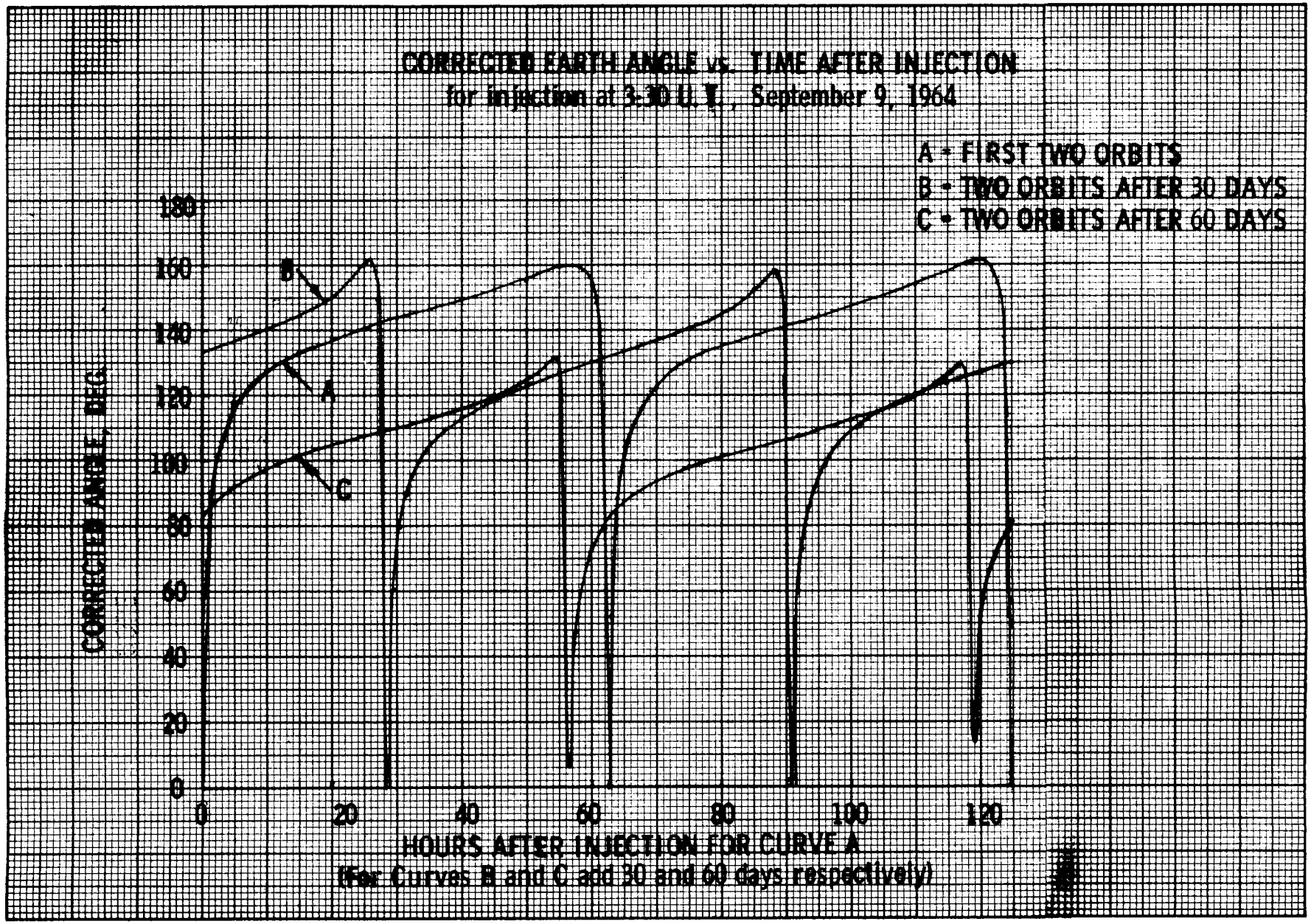

CORRECTED EARTH ANGLE vs. TIME AFTER INJECTION
for injection at 3:30 U.T., September 9, 1964
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
CORRECTED ANGLE, DEG
180
160
140
120
100
80
60
40
20
0
B
A
C
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-4

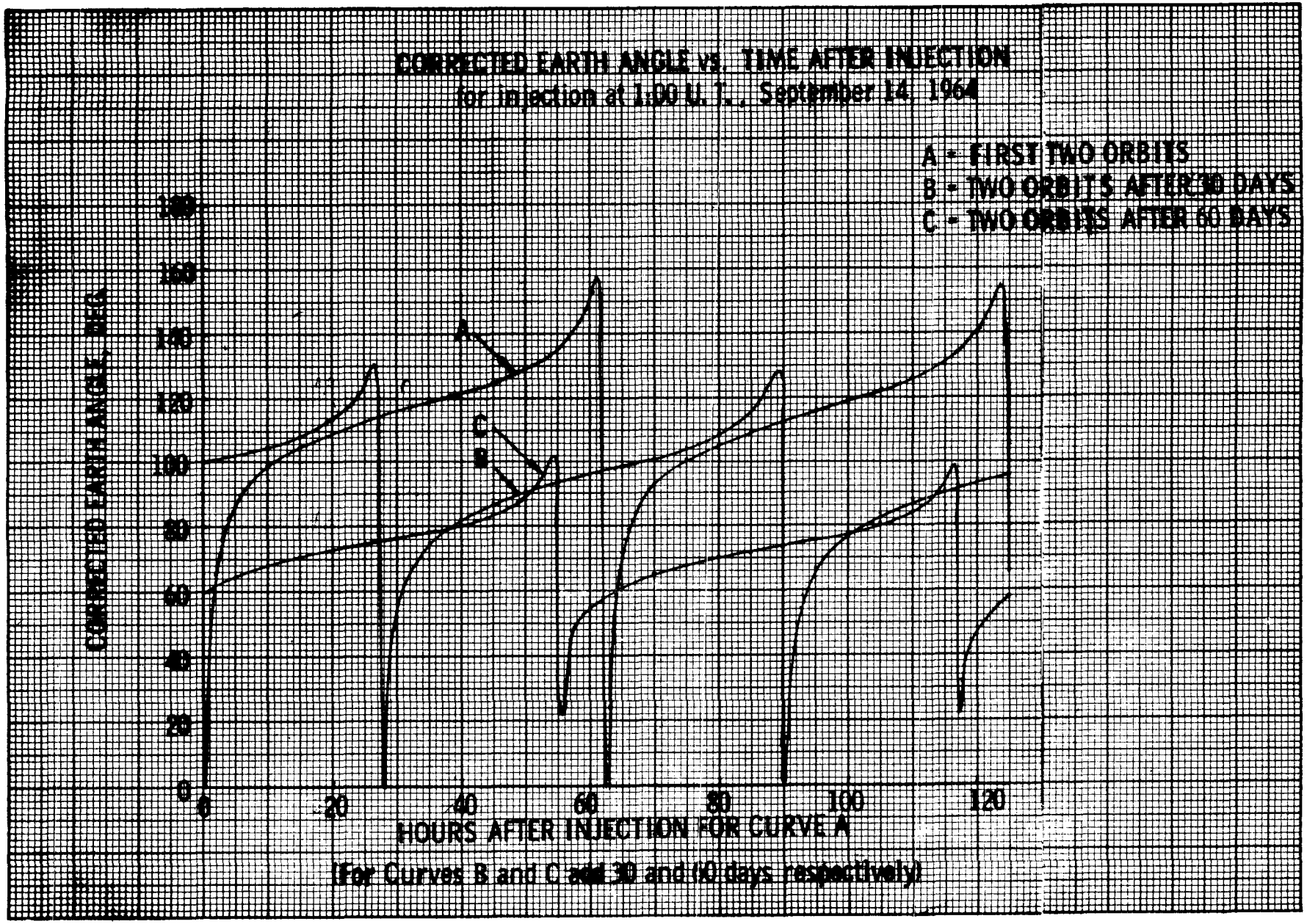

CORRECTED EARTH ANGLE vs. TIME AFTER INJECTION
for injection at 1:00 U. T., September 14, 1964
A - FIRST TWO ORBITS
B - TWO ORBITS AFTER 30 DAYS
C - TWO ORBITS AFTER 60 DAYS
CORRECTED EARTH ANGLE
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-5

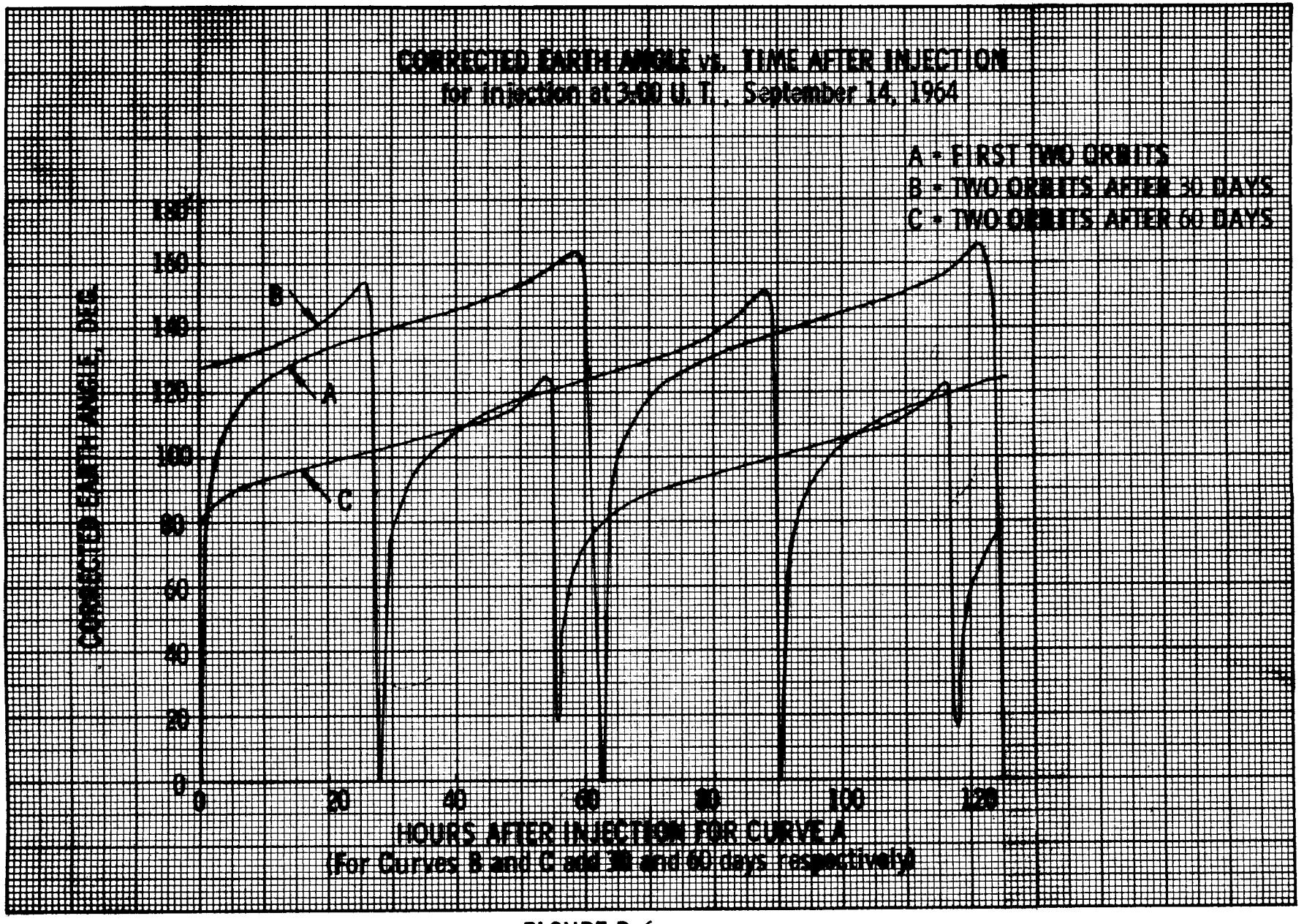

CORRECTED EARTH ANGLE vs. TIME AFTER INJECTION
for injection at 3:00 U. T., September 14, 1964
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
CORRECTED EARTH ANGLE (DEG)
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120
B
A
C
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-6

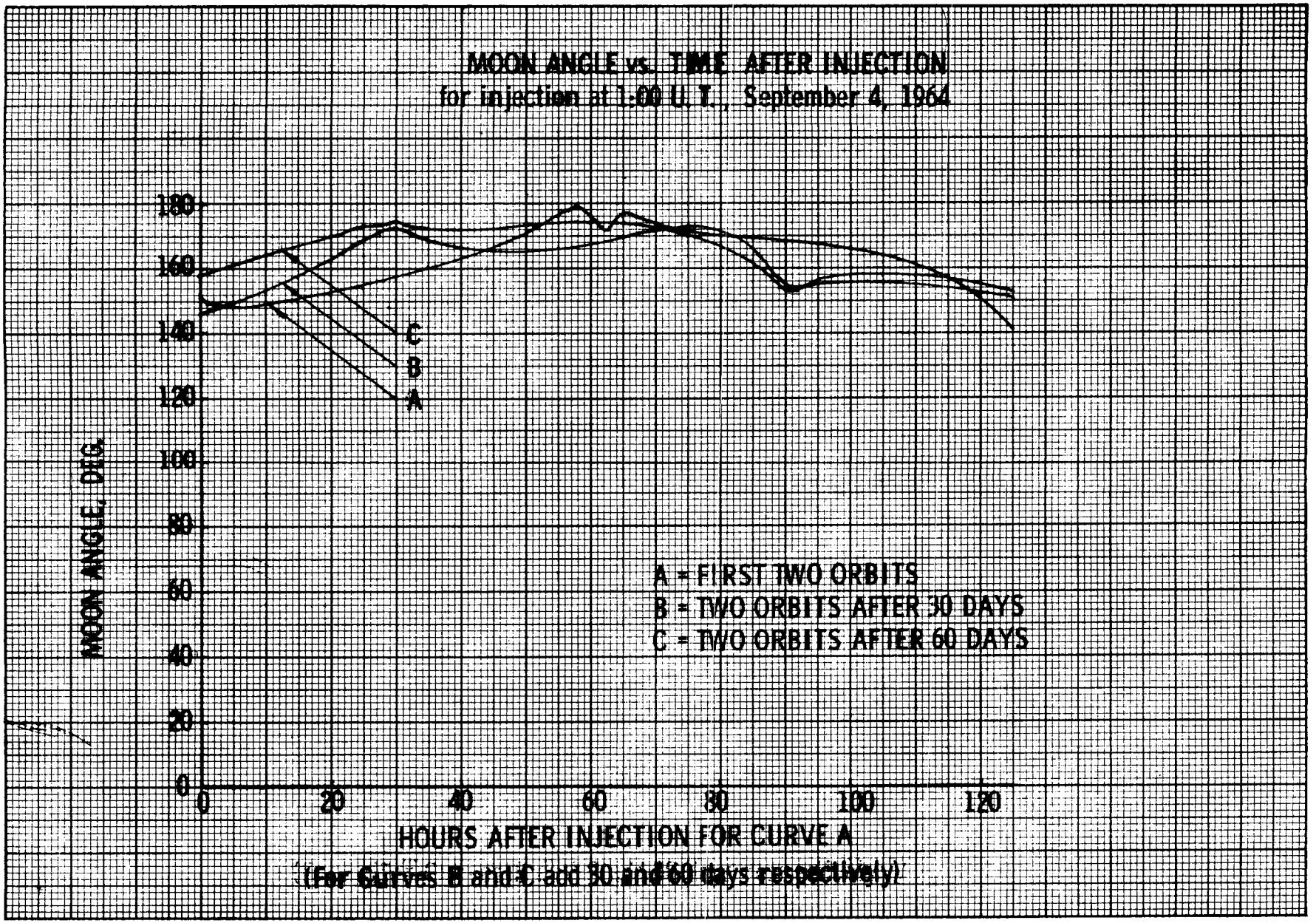

MOON ANGLE vs. TIME AFTER INJECTION
for injection at 1:00 U.T., September 4, 1964
MOON ANGLE, DEG.
180
160
140
120
100
80
60
40
20
0
C
B
A
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-7

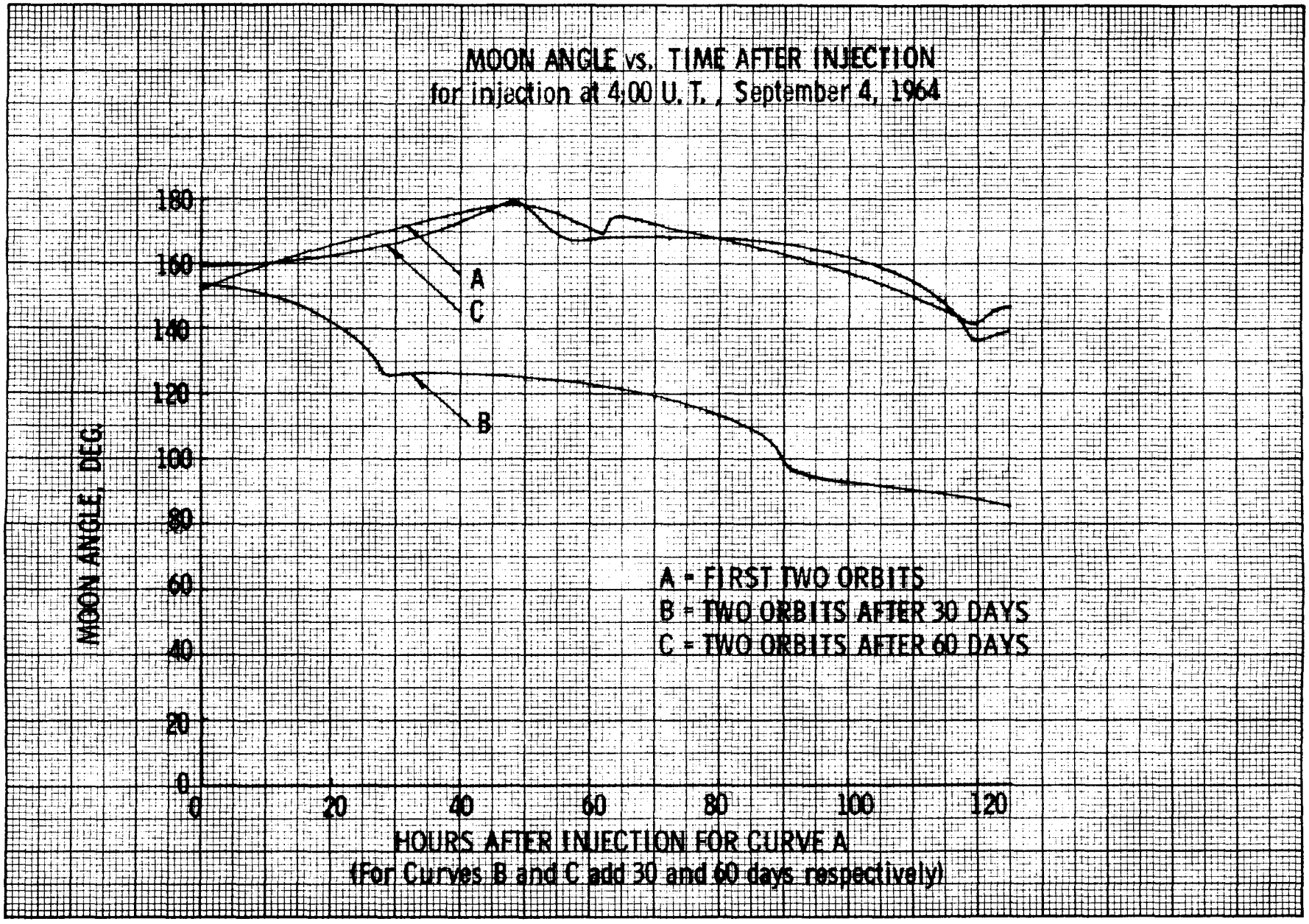

MOON ANGLE vs. TIME AFTER INJECTION
for injection at 4:00 U.T., September 4, 1964
MOON ANGLE, DEG.
180
160
140
120
100
80
60
40
20
0
A
C
B
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-8

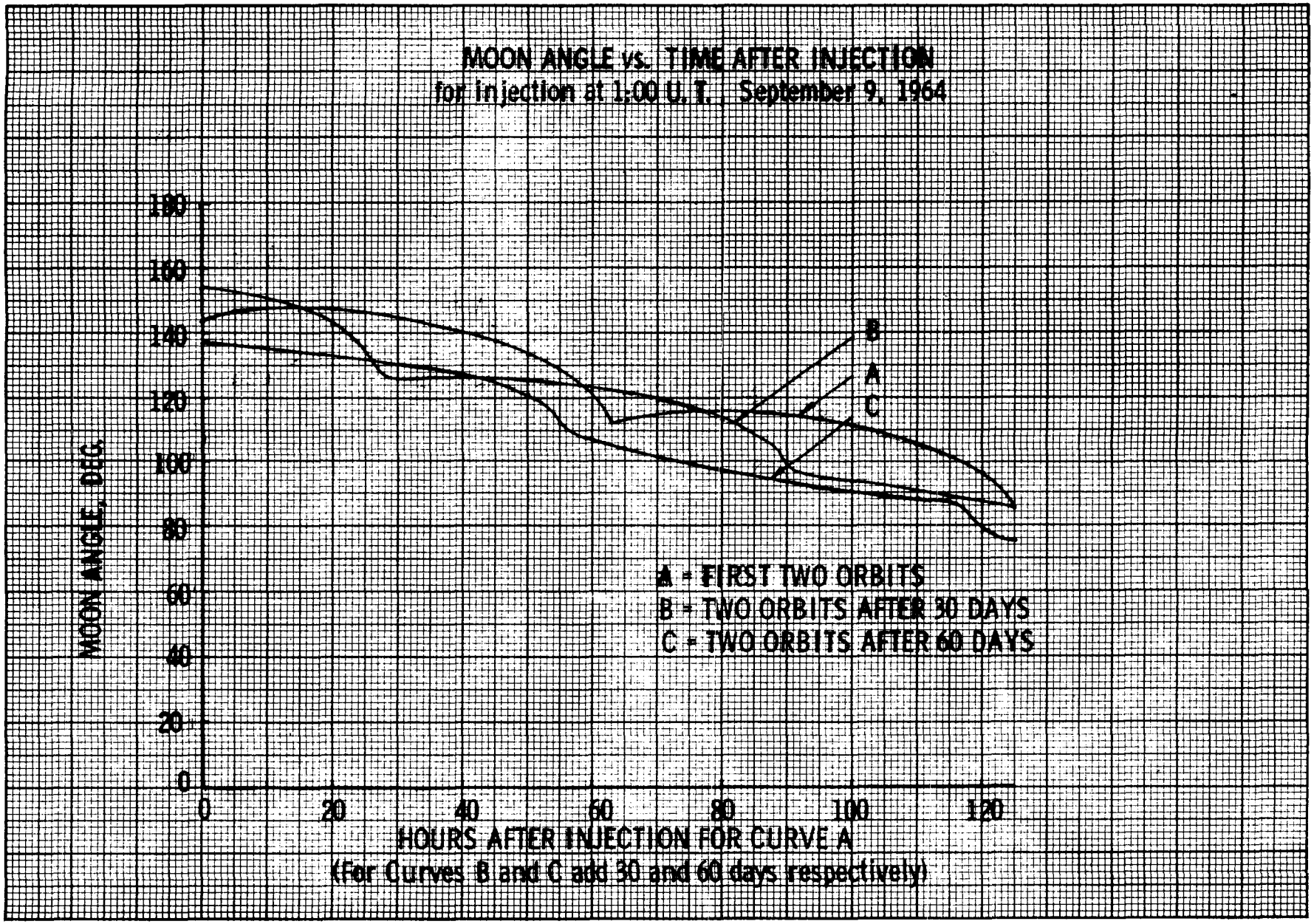

MOON ANGLE vs. TIME AFTER INJECTION
for injection at 1:00 U.T., September 9, 1964
MOON ANGLE, degs
180
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)
A
B
C
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS

FIGURE B-9

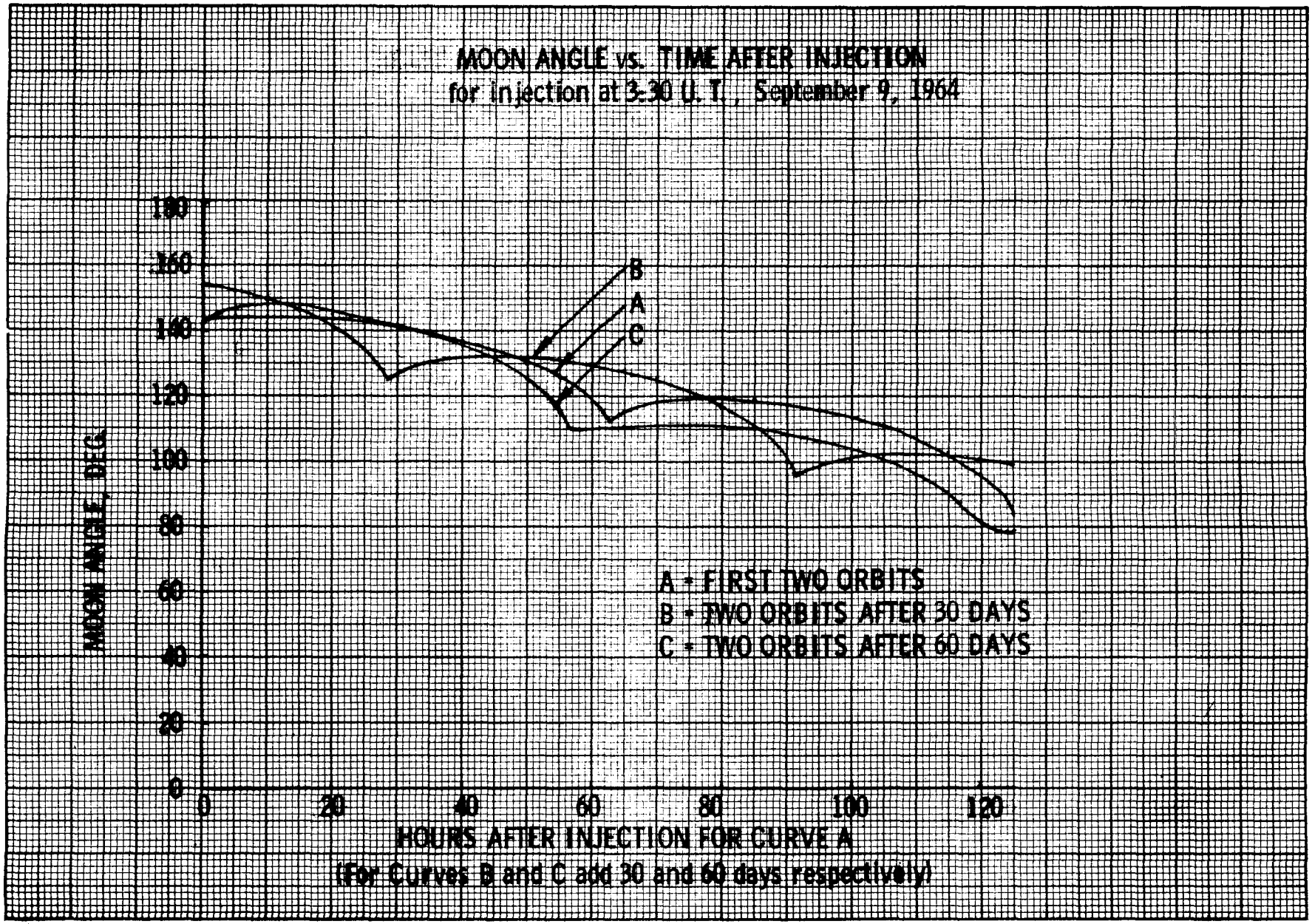

MOON ANGLE vs. TIME AFTER INJECTION
for injection at 3:30 U. T., September 9, 1964
MOON ANGLE, DEG
180
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120
B
A
C
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-10

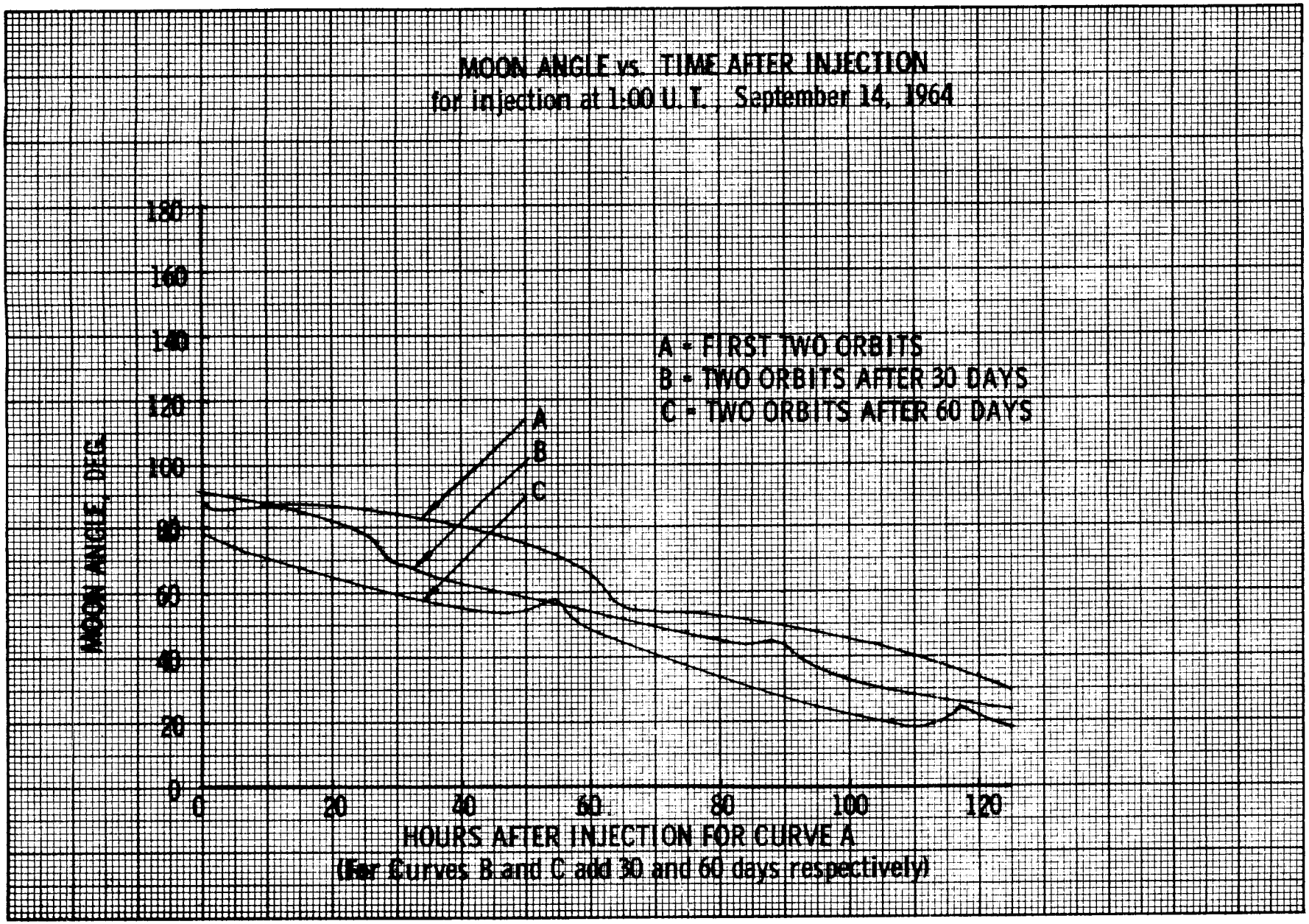

MOON ANGLE vs. TIME AFTER INJECTION
for injection at 1:00 U.T., September 14, 1964
A = FIRST TWO ORBITS
B = TWO ORBITS AFTER 30 DAYS
C = TWO ORBITS AFTER 60 DAYS
MOON ANGLE, DEG
180
160
140
120
100
80
60
40
20
0
A
B
C
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-11

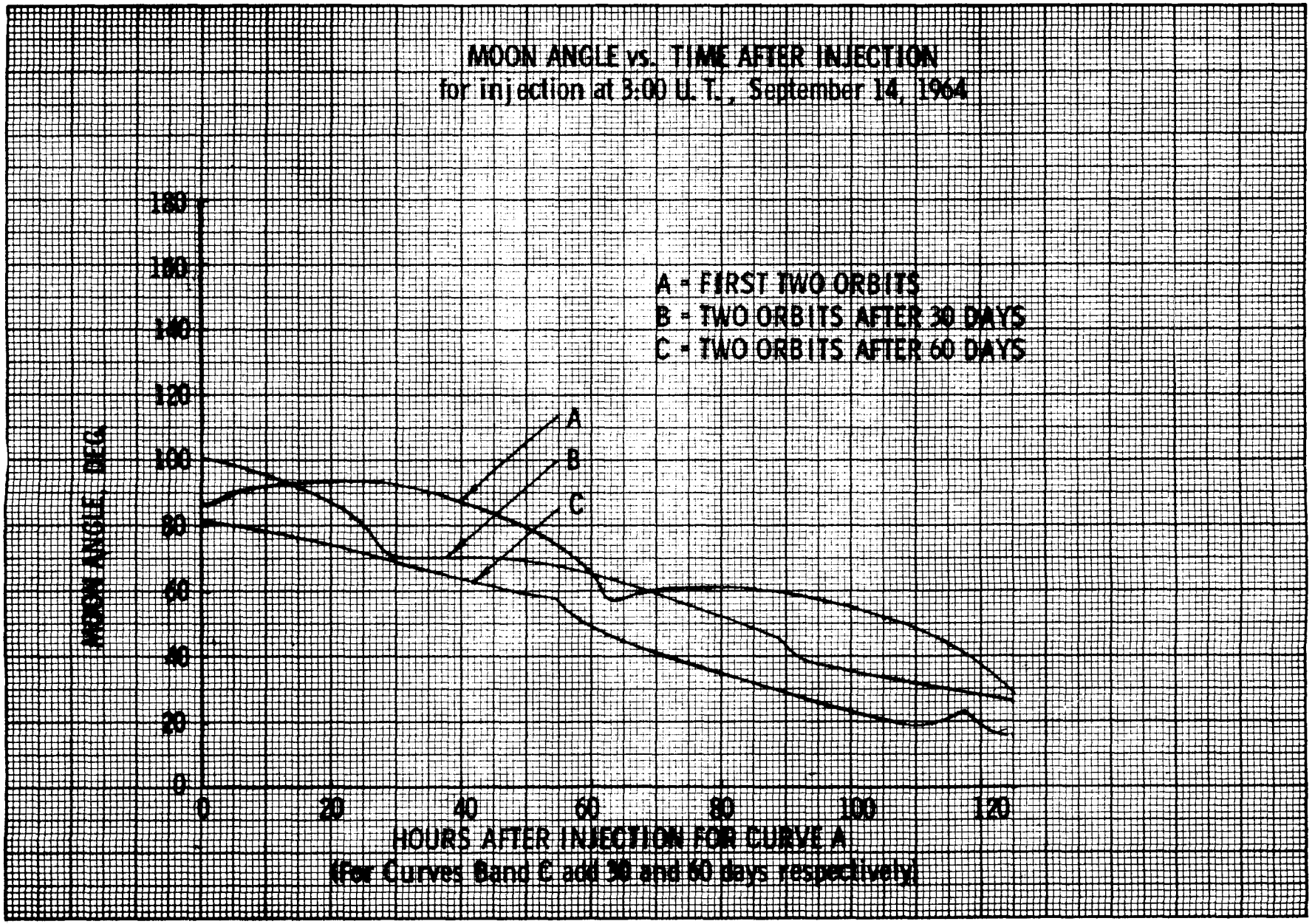

MOON ANGLE vs. TIME AFTER INJECTION
for injection at 3:00 U.T., September 14, 1964
A - FIRST TWO ORBITS
B - TWO ORBITS AFTER 30 DAYS
C - TWO ORBITS AFTER 60 DAYS
MOON ANGLE, deg
180
160
140
120
100
80
60
40
20
0
A
B
C
0
20
40
60
80
100
120
HOURS AFTER INJECTION FOR CURVE A
(For Curves B and C add 30 and 60 days respectively)

FIGURE B-12

APPENDIX C

SPACECRAFT ANGLES

27.000	112.70	136.32	127.39	55.61	156.80	36.96	99.63	119.71
28.000	112.43	135.59	127.05	56.19	155.84	37.75	99.14	119.91
29.000	112.14	134.85	126.69	56.77	154.88	38.55	98.66	120.11
30.000	111.85	134.10	126.33	57.36	153.91	39.35	98.17	120.29
31.000	111.55	133.35	125.95	57.95	152.94	40.16	97.67	120.46
32.000	111.25	132.58	125.56	58.55	151.97	40.98	97.17	120.61
33.000	110.93	131.81	125.16	59.16	150.99	41.81	96.67	120.76
34.000	110.62	131.03	124.75	59.77	150.01	42.63	96.17	120.89
35.000	110.29	130.24	124.32	60.38	149.03	43.47	95.67	121.02
36.000	109.96	129.44	123.89	61.01	148.05	44.31	95.16	121.13
37.000	109.62	128.64	123.44	61.63	147.07	45.15	94.65	121.23
38.000	109.27	127.84	122.99	62.26	146.09	46.00	94.14	121.31
39.000	108.92	127.02	122.52	62.90	145.10	46.86	93.62	121.39
40.000	108.57	126.21	122.05	63.54	144.11	47.71	93.11	121.45
41.000	108.20	125.38	121.56	64.18	143.12	48.58	92.59	121.50
42.000	107.83	124.55	121.07	64.83	142.14	49.44	92.07	121.54
43.000	107.46	123.72	120.57	65.48	141.15	50.31	91.55	121.57
44.000	107.08	122.88	120.05	66.13	140.15	51.18	91.02	121.59
45.000	106.69	122.04	119.54	66.79	139.16	52.05	90.50	121.59
46.000	106.30	121.19	119.01	67.45	138.17	52.93	89.98	121.58
47.000	105.91	120.34	118.47	68.12	137.18	53.81	89.45	121.56
48.000	105.51	119.49	117.93	68.78	136.18	54.69	88.92	121.53
49.000	105.10	118.63	117.38	69.45	135.19	55.58	88.40	121.48
50.000	104.69	117.77	116.82	70.13	134.19	56.46	87.87	121.42
51.000	104.28	116.91	116.26	70.80	133.20	57.35	87.34	121.35
52.000	103.86	116.04	115.69	71.48	132.20	58.24	86.81	121.27
53.000	103.44	115.17	115.11	72.16	131.21	59.13	86.28	121.18
54.000	103.01	114.30	114.53	72.84	130.21	60.03	85.75	121.08
55.000	102.58	113.42	113.94	73.53	129.21	60.92	85.22	120.96
56.000	102.15	112.54	113.34	74.21	128.21	61.82	84.69	120.84

LIMIT ON HALF ANGLE FIELD OF VISION = 15.00000 DEG.
INCREMENT ON SOLAR ARRAY ANGLE **** = 1.00000 DEG.

SOLAR ARRAY ANGLE (DEG)	ANGLE BETWEEN GEGENSCHEIN EXPERIMENT NORMAL AND BOOM MOUNTED EXPERIMENTS (DEG)							
	E.P.1	E.P.2	E.P.3	E.P.4	E.P.5 (EDGE)	E.P.6	OPEP 1	OPEP 2
1.000	116.96	149.88	131.13	44.02	171.95	22.04	110.70	111.10
2.000	116.91	149.64	131.18	44.30	172.40	22.28	110.34	111.53
3.000	116.84	149.37	131.22	44.61	172.73	22.55	109.98	111.96
4.000	116.77	149.06	131.24	44.93	172.94	22.86	109.61	112.37
5.000	116.69	148.74	131.24	45.26	173.01	23.21	109.23	112.78
6.000	116.61	148.38	131.23	45.61	172.94	23.59	108.84	113.19
7.000	116.51	148.00	131.20	45.97	172.72	24.01	108.46	113.58
8.000	116.40	147.60	131.16	46.35	172.38	24.46	108.06	113.97
9.000	116.28	147.17	131.10	46.74	171.93	24.94	107.66	114.35
10.000	116.16	146.72	131.02	47.14	171.38	25.44	107.25	114.73
11.000	116.02	146.24	130.93	47.55	170.76	25.97	106.84	115.09
12.000	115.88	145.75	130.82	47.98	170.08	26.53	106.43	115.45
13.000	115.73	145.23	130.70	48.42	169.34	27.11	106.01	115.80
14.000	115.57	144.70	130.56	48.87	168.56	27.71	105.58	116.14
15.000	115.40	144.14	130.40	49.33	167.75	28.33	105.15	116.47
16.000	115.22	143.57	130.23	49.81	166.92	28.97	104.71	116.79
17.000	115.03	142.98	130.04	50.29	166.06	29.63	104.27	117.11
18.000	114.83	142.38	129.84	50.78	165.18	30.31	103.83	117.41
19.000	114.63	141.76	129.63	51.28	164.28	31.00	103.38	117.71
20.000	114.42	141.12	129.40	51.80	163.38	31.70	102.92	117.99
21.000	114.20	140.47	129.15	52.32	162.46	32.42	102.46	118.27
22.000	113.97	139.81	128.89	52.85	161.54	33.15	102.00	118.54
23.000	113.73	139.14	128.62	53.38	160.60	33.89	101.53	118.79
24.000	113.48	138.45	128.33	53.93	159.66	34.64	101.06	119.04
25.000	113.23	137.75	128.03	54.48	158.71	35.41	100.59	119.27
26.000	112.97	137.04	127.72	55.04	157.76	36.18	100.11	119.50

	57.000	I	101.71	111.66	112.74	74.90	127.22	62.72	84.16	120.70
	58.000	I	101.27	110.78	112.13	75.59	126.22	63.62	83.64	120.55
	59.000	I	100.82	109.90	111.52	76.29	125.22	64.52	83.11	120.39
	60.000	I	100.38	109.01	110.91	76.98	124.22	65.43	82.58	120.22
	61.000	I	99.93	108.12	110.29	77.67	123.22	66.33	82.06	120.04
	62.000	I	99.47	107.23	109.66	78.37	122.22	67.24	81.53	119.84
	63.000	I	99.02	106.34	109.03	79.07	121.22	68.14	81.01	119.64
	64.000	I	98.56	105.44	108.40	79.77	120.22	69.05	80.49	119.43
	65.000	I	98.10	104.55	107.76	80.47	119.22	69.96	79.97	119.20
	66.000	I	97.63	103.65	107.12	81.17	118.22	70.87	79.45	118.97
	67.000	I	97.17	102.76	106.47	81.87	117.22	71.78	78.93	118.73
	68.000	I	96.70	101.86	105.83	82.57	116.22	72.69	78.42	118.47
	69.000	I	96.23	100.96	105.17	83.28	115.22	73.60	77.91	118.21
	70.000	I	95.76	100.06	104.52	83.98	114.22	74.52	77.40	117.94
	71.000	I	95.29	99.16	103.86	84.69	113.22	75.43	76.89	117.66
	72.000	I	94.81	98.25	103.20	85.39	112.22	76.34	76.39	117.37
	73.000	I	94.34	97.35	102.54	86.10	111.21	77.26	75.89	117.07
	74.000	I	93.86	96.45	101.88	86.80	110.21	78.17	75.39	116.77
	75.000	I	93.38	95.54	101.21	87.51	109.21	79.09	74.90	116.45
	76.000	I	92.90	94.64	100.54	88.22	108.21	80.01	74.41	116.13
	77.000	I	92.42	93.74	99.87	88.93	107.21	80.92	73.92	115.80
	78.000	I	91.94	92.83	99.20	89.63	106.21	81.84	73.43	115.46
	79.000	I	91.46	91.93	98.52	90.34	105.21	82.76	72.96	115.12
	80.000	I	90.98	91.02	97.84	91.05	104.20	83.68	72.48	114.77
	81.000	I	90.50	90.11	97.17	91.75	103.20	84.59	72.01	114.41
	82.000	I	90.02	89.21	96.49	92.46	102.20	85.51	71.54	114.04
	83.000	I	89.54	88.30	95.81	93.17	101.20	86.43	71.08	113.67
	84.000	I	89.06	87.40	95.13	93.88	100.20	87.35	70.63	113.29
	85.000	I	88.58	86.49	94.45	94.58	99.20	88.27	70.17	112.90
	86.000	I	88.10	85.59	93.77	95.29	98.19	89.19	69.73	112.51
	87.000	I	87.62	84.69	93.09	95.99	97.19	90.11	69.29	112.11

88.000	87.14	83.78	92.40	96.70	96.19	91.03	68.85	111.71
89.000	86.66	82.88	91.72	97.40	95.19	91.95	68.43	111.30
90.000	86.19	81.98	91.04	98.10	94.19	92.87	68.00	110.89
91.000	85.71	81.08	90.36	98.81	93.19	93.79	67.59	110.47
92.000	85.24	80.18	89.68	99.51	92.18	94.70	67.18	110.05
93.000	84.77	79.28	88.99	100.21	91.18	95.62	66.78	109.62
94.000	84.29	78.38	88.31	100.91	90.18	96.54	66.38	109.19
95.000	83.83	77.48	87.63	101.61	89.18	97.46	65.99	108.75
96.000	83.36	76.59	86.95	102.30	88.18	98.38	65.61	108.31
97.000	82.89	75.69	86.27	103.00	87.18	99.30	65.24	107.86
98.000	82.43	74.80	85.60	103.69	86.18	100.22	64.87	107.41
99.000	81.97	73.91	84.92	104.38	85.18	101.13	64.52	106.96
100.000	81.51	73.02	84.25	105.07	84.18	102.05	64.17	106.50
101.000	81.06	72.13	83.57	105.76	83.18	102.97	63.83	106.04
102.000	80.60	71.25	82.90	106.45	82.18	103.89	63.49	105.58
103.000	80.15	70.36	82.23	107.13	81.18	104.80	63.17	105.11
104.000	79.71	69.48	81.56	107.82	80.18	105.72	62.86	104.65
105.000	79.26	68.60	80.90	108.50	79.18	106.63	62.55	104.17
106.000	78.82	67.72	80.23	109.18	78.18	107.55	62.26	103.70
107.000	78.38	66.85	79.57	109.85	77.18	108.46	61.97	103.22
108.000	77.95	65.97	78.91	110.53	76.18	109.37	61.69	102.75
109.000	77.52	65.10	78.26	111.20	75.18	110.29	61.43	102.27
110.000	77.09	64.24	77.60	111.86	74.18	111.20	61.17	101.78
111.000	76.67	63.37	76.95	112.53	73.18	112.11	60.92	101.30
112.000	76.25	62.51	76.30	113.19	72.18	113.02	60.69	100.81
113.000	75.84	61.65	75.66	113.85	71.19	113.93	60.46	100.33
114.000	75.43	60.80	75.02	114.50	70.19	114.84	60.25	99.84
115.000	75.02	59.95	74.38	115.16	69.19	115.74	60.05	99.35
116.000	74.62	59.10	73.75	115.80	68.19	116.65	59.85	98.86
117.000	74.23	58.26	73.12	116.45	67.20	117.55	59.67	98.37

118.000	73.84	57.42	72.49	117.09	66.20	118.45	59.50	97.88
119.000	73.45	56.58	71.87	117.72	65.20	119.36	59.34	97.38
120.000	73.07	55.75	71.25	118.36	64.21	120.26	59.20	96.89
121.000	72.69	54.93	70.64	118.98	63.21	121.15	59.06	96.39
122.000	72.32	54.11	70.03	119.60	62.21	122.05	58.94	95.90
123.000	71.96	53.29	69.43	120.22	61.22	122.95	58.82	95.41
124.000	71.60	52.48	68.83	120.83	60.22	123.84	58.72	94.91
125.000	71.25	51.68	68.24	121.44	59.23	124.73	58.64	94.42
126.000	70.90	50.88	67.65	122.04	58.24	125.62	58.56	93.92
127.000	70.56	50.09	67.07	122.63	57.24	126.50	58.50	93.43
128.000	70.23	49.31	66.49	123.22	56.25	127.39	58.44	92.93
129.000	69.90	48.53	65.92	123.81	55.25	128.27	58.41	92.44
130.000	69.58	47.76	65.36	124.38	54.26	129.15	58.38	91.95
131.000	69.26	47.00	64.80	124.95	53.27	130.02	58.36	91.45
132.000	68.96	46.24	64.25	125.51	52.28	130.89	58.36	90.96
133.000	68.66	45.50	63.71	126.07	51.29	131.76	58.37	90.47
134.000	68.36	44.76	63.17	126.61	50.30	132.63	58.39	89.98
135.000	68.07	44.03	62.64	127.15	49.31	133.49	58.42	89.49
136.000	67.79	43.32	62.12	127.68	48.32	134.35	58.47	89.01
137.000	67.52	42.61	61.60	128.20	47.33	135.20	58.52	88.52
138.000	67.26	41.91	61.10	128.72	46.34	136.05	58.59	88.04
139.000	67.00	41.23	60.60	129.22	45.35	136.90	58.67	87.55
140.000	66.75	40.55	60.10	129.71	44.36	137.74	58.77	87.07
141.000	66.51	39.89	59.62	130.20	43.38	138.57	58.87	86.59
142.000	66.27	39.24	59.15	130.67	42.39	139.40	58.99	86.11
143.000	66.05	38.61	58.68	131.13	41.41	140.22	59.12	85.64
144.000	65.83	37.99	58.23	131.58	40.42	141.04	59.25	85.16
145.000	65.62	37.39	57.78	132.02	39.44	141.85	59.40	84.69
146.000	65.42	36.80	57.34	132.45	38.46	142.65	59.57	84.22
147.000	65.22	36.22	56.92	132.87	37.48	143.44	59.74	83.75

	148.000	I	65.04	35.67	56.50	133.27	36.50	144.22	59.92	83.29
	149.000	I	64.86	35.13	56.09	133.66	35.52	145.00	60.12	82.82
	150.000	I	64.69	34.61	55.69	134.04	34.54	145.76	60.32	82.36
	151.000	I	64.53	34.12	55.31	134.40	33.57	146.52	60.53	81.90
	152.000	I	64.38	33.64	54.93	134.75	32.59	147.26	60.76	81.45
	153.000	I	64.24	33.18	54.57	135.08	31.62	147.99	61.00	80.99
	154.000	I	64.10	32.75	54.22	135.40	30.65	148.71	61.24	80.54
	155.000	I	63.98	32.34	53.88	135.71	29.68	149.42	61.49	80.10
	156.000	I	63.86	31.95	53.55	135.99	28.71	150.11	61.76	79.65
	157.000	I	63.75	31.59	53.23	136.27	27.75	150.78	62.03	79.21
	158.000	I	63.65	31.25	52.92	136.52	26.78	151.44	62.32	78.77
	159.000	I	63.56	30.94	52.63	136.76	25.82	152.07	62.61	78.34
	160.000	I	63.48	30.65	52.35	136.98	24.87	152.69	62.91	77.90
	161.000	I	63.41	30.40	52.08	137.19	23.91	153.29	63.22	77.47
	162.000	I	63.34	30.17	51.83	137.37	22.96	153.86	63.53	77.05
	163.000	I	63.29	29.97	51.59	137.54	22.02	154.41	63.86	76.63
	164.000	I	63.24	29.80	51.36	137.69	21.08	154.94	64.19	76.21
	165.000	I	63.21	29.67	51.14	137.82	20.14	155.43	64.53	75.80
	166.000	I	63.18	29.56	50.94	137.93	19.22	155.90	64.88	75.39
	167.000	I	63.16	29.48	50.75	138.03	18.29	156.34	65.24	74.98
	168.000	I	63.15	29.43	50.58	138.10	17.38	156.74	65.60	74.58
	169.000	I	63.15	29.42	50.42	138.16	16.48	157.11	65.97	74.18
	170.000	I	63.16	29.43	50.27	138.19	15.58	157.44	66.35	73.78
NO GO	171.000	I	63.17	29.48	50.14	138.21	* 14.70	157.74	66.73	73.39
NO GO	172.000	I	63.20	29.55	50.02	138.20	* 13.84	157.99	67.12	73.01
NO GO	173.000	I	63.23	29.66	49.92	138.18	* 13.00	158.21	67.52	72.62
NO GO	174.000	I	63.27	29.80	49.83	138.14	* 12.17	158.38	67.92	72.25
NO GO	175.000	I	63.32	29.96	49.76	138.07	* 11.38	158.51	68.33	71.87
NO GO	176.000	I	63.38	30.16	49.69	137.99	* 10.62	158.59	68.74	71.50
NO GO	177.000	I	63.45	30.38	49.65	137.89	* 9.90	158.63	69.16	71.14

NO GO	178.000	I	63.53	30.63	49.62	137.76	*	9.23	158.63	69.58	70.78
NO GO	179.000	I	63.61	30.91	49.60	137.62	*	8.63	158.58	70.01	70.43
NO GO	180.000	I	63.71	31.21	49.60	137.46	*	8.10	158.48	70.45	70.08
NO GO	181.000	I	63.81	31.54	49.61	137.28	*	7.66	158.34	70.89	69.73
NO GO	182.000	I	63.92	31.89	49.64	137.08	*	7.34	158.16	71.33	69.39
NO GO	183.000	I	64.03	32.27	49.68	136.87	*	7.13	157.94	71.77	69.06
NO GO	184.000	I	64.16	32.67	49.73	136.63	*	7.07	157.67	72.23	68.73
NO GO	185.000	I	64.29	33.09	49.80	136.38	*	7.14	157.37	72.68	68.41
NO GO	186.000	I	64.43	33.53	49.88	136.11	*	7.34	157.02	73.14	68.09
NO GO	187.000	I	64.58	33.99	49.98	135.82	*	7.67	156.65	73.60	67.78
NO GO	188.000	I	64.74	34.48	50.09	135.51	*	8.11	156.23	74.07	67.47
NO GO	189.000	I	64.90	34.97	50.21	135.19	*	8.64	155.79	74.53	67.17
NO GO	190.000	I	65.07	35.49	50.35	134.85	*	9.25	155.31	75.00	66.87
NO GO	191.000	I	65.25	36.02	50.50	134.49	*	9.92	154.80	75.48	66.59
NO GO	192.000	I	65.44	36.57	50.67	134.12	*	10.63	154.27	75.96	66.30
NO GO	193.000	I	65.63	37.14	50.84	133.73	*	11.39	153.71	76.44	66.02
NO GO	194.000	I	65.83	37.72	51.03	133.33	*	12.19	153.12	76.92	65.75
NO GO	195.000	I	66.04	38.31	51.23	132.91	*	13.01	152.52	77.40	65.49
NO GO	196.000	I	66.25	38.91	51.45	132.48	*	13.85	151.89	77.89	65.23
NO GO	197.000	I	66.47	39.53	51.68	132.04	*	14.71	151.24	78.38	64.98
	198.000	I	66.70	40.16	51.92	131.58		15.58	150.57	78.87	64.73
	199.000	I	66.93	40.80	52.17	131.11		16.47	149.89	79.36	64.49
	200.000	I	67.17	41.45	52.43	130.62		17.37	149.19	79.85	64.26
	201.000	I	67.42	42.11	52.71	130.12		18.28	148.47	80.34	64.03
	202.000	I	67.67	42.78	52.99	129.61		19.20	147.74	80.84	63.81
	203.000	I	67.92	43.46	53.29	129.09		20.12	147.00	81.34	63.60
	204.000	I	68.19	44.15	53.59	128.56		21.05	146.24	81.83	63.39
	205.000	I	68.46	44.84	53.91	128.02		21.98	145.47	82.33	63.19
	206.000	I	68.73	45.55	54.24	127.46		22.92	144.70	82.83	63.00
	207.000	I	69.01	46.26	54.58	126.90		23.87	143.91	83.33	62.82
	208.000	I	69.30	46.98	54.93	126.32		24.81	143.11	83.83	62.64

209.000	69.59	47.70	55.29	125.74	25.76	142.30	84.33	62.47
210.000	69.88	48.43	55.65	125.14	26.71	141.49	84.83	62.31
211.000	70.18	49.17	56.03	124.54	27.67	140.67	85.33	62.15
212.000	70.49	49.91	56.42	123.93	28.63	139.84	85.83	62.00
213.000	70.80	50.66	56.81	123.31	29.58	139.00	86.33	61.87
214.000	71.11	51.41	57.21	122.68	30.54	138.16	86.83	61.73
215.000	71.43	52.17	57.62	122.04	31.51	137.31	87.33	61.61
216.000	71.76	52.93	58.04	121.40	32.47	136.45	87.83	61.49
217.000	72.09	53.69	58.47	120.75	33.44	135.59	88.33	61.38
218.000	72.42	54.46	58.90	120.09	34.40	134.73	88.82	61.28
219.000	72.76	55.24	59.35	119.43	35.37	133.86	89.32	61.19
220.000	73.10	56.02	59.80	118.75	36.34	132.98	89.82	61.11
221.000	73.44	56.80	60.25	118.08	37.31	132.10	90.31	61.03
222.000	73.79	57.58	60.72	117.39	38.28	131.22	90.80	60.96
223.000	74.14	58.37	61.19	116.70	39.25	130.34	91.30	60.90
224.000	74.50	59.16	61.66	116.01	40.22	129.45	91.79	60.85
225.000	74.86	59.95	62.14	115.31	41.19	128.55	92.28	60.81
226.000	75.22	60.75	62.63	114.60	42.16	127.66	92.76	60.77
227.000	75.59	61.55	63.13	113.89	43.14	126.76	93.25	60.75
228.000	75.96	62.35	63.63	113.18	44.11	125.85	93.73	60.73
229.000	76.33	63.15	64.14	112.46	45.09	124.95	94.22	60.72
230.000	76.70	63.96	64.65	111.74	46.06	124.04	94.70	60.72
231.000	77.08	64.77	65.16	111.01	47.04	123.13	95.17	60.73
232.000	77.46	65.57	65.69	110.28	48.01	122.22	95.65	60.74
233.000	77.85	66.39	66.21	109.54	48.99	121.31	96.12	60.77
234.000	78.23	67.20	66.74	108.80	49.97	120.39	96.59	60.80
235.000	78.62	68.01	67.28	108.06	50.94	119.47	97.06	60.85
236.000	79.01	68.83	67.82	107.31	51.92	118.55	97.53	60.90
237.000	79.40	69.65	68.37	106.56	52.90	117.63	97.99	60.96
238.000	79.80	70.47	68.91	105.81	53.88	116.71	98.45	61.02

239.000	80.20	71.29	69.47	105.06	54.86	115.78	98.91	61.10
240.000	80.60	72.11	70.03	104.30	55.83	114.86	99.37	61.19
241.000	81.00	72.94	70.59	103.54	56.81	113.93	99.82	61.28
242.000	81.40	73.76	71.15	102.78	57.79	113.00	100.27	61.38
243.000	81.81	74.59	71.72	102.01	58.77	112.07	100.72	61.50
244.000	82.21	75.41	72.29	101.25	59.75	111.14	101.16	61.62
245.000	82.62	76.24	72.86	100.48	60.73	110.21	101.60	61.75
246.000	83.03	77.07	73.44	99.71	61.71	109.27	102.03	61.88
247.000	83.45	77.90	74.02	98.94	62.69	108.34	102.47	62.03
248.000	83.86	78.73	74.61	98.16	63.67	107.40	102.90	62.18
249.000	84.27	79.56	75.19	97.39	64.65	106.47	103.32	62.35
250.000	84.69	80.39	75.78	96.61	65.63	105.53	103.74	62.52
251.000	85.10	81.22	76.38	95.84	66.61	104.59	104.16	62.70
252.000	85.52	82.06	76.97	95.06	67.59	103.65	104.58	62.88
253.000	85.94	82.89	77.57	94.28	68.57	102.72	104.99	63.08
254.000	86.36	83.72	78.17	93.50	69.55	101.78	105.39	63.28
255.000	86.78	84.56	78.77	92.72	70.54	100.84	105.79	63.50
256.000	87.20	85.39	79.37	91.94	71.52	99.90	106.19	63.72
257.000	87.62	86.23	79.98	91.16	72.50	98.96	106.58	63.95
258.000	88.05	87.06	80.58	90.38	73.48	98.01	106.97	64.18
259.000	88.47	87.90	81.19	89.60	74.46	97.07	107.36	64.43
260.000	88.89	88.73	81.80	88.82	75.45	96.13	107.74	64.68
261.000	89.31	89.57	82.41	88.04	76.43	95.19	108.11	64.94
262.000	89.74	90.40	83.03	87.26	77.41	94.25	108.48	65.21
263.000	90.16	91.24	83.64	86.48	78.39	93.31	108.85	65.48
264.000	90.59	92.07	84.26	85.70	79.37	92.36	109.21	65.77
265.000	91.01	92.91	84.88	84.92	80.36	91.42	109.56	66.06
266.000	91.43	93.75	85.50	84.15	81.34	90.48	109.91	66.35
267.000	91.86	94.58	86.12	83.37	82.32	89.54	110.26	66.66
268.000	92.28	95.42	86.74	82.59	83.31	88.59	110.60	66.97

	269.000	I	92.70	96.25	87.36	81.82	84.29	87.65	110.93	67.29
	270.000	I	93.13	97.09	87.98	81.05	85.27	86.71	111.26	67.62
	271.000	I	93.55	97.92	88.60	80.28	86.26	85.77	111.59	67.95
	272.000	I	93.97	98.76	89.23	79.51	87.24	84.83	111.90	68.29
	273.000	I	94.39	99.59	89.85	78.74	88.22	83.89	112.22	68.63
	274.000	I	94.81	100.42	90.48	77.97	89.21	82.95	112.52	68.99
	275.000	I	95.23	101.26	91.10	77.21	90.19	82.01	112.82	69.35
	276.000	I	95.65	102.09	91.73	76.45	91.17	81.07	113.12	69.71
	277.000	I	96.07	102.92	92.35	75.69	92.16	80.13	113.41	70.09
	278.000	I	96.48	103.75	92.98	74.93	93.14	79.19	113.69	70.46
	279.000	I	96.90	104.58	93.60	74.18	94.13	78.25	113.97	70.85
	280.000	I	97.31	105.41	94.23	73.42	95.11	77.31	114.24	71.24
	281.000	I	97.73	106.24	94.85	72.68	96.10	76.38	114.50	71.64
	282.000	I	98.14	107.07	95.48	71.93	97.08	75.44	114.76	72.04
	283.000	I	98.55	107.90	96.10	71.19	98.06	74.50	115.01	72.45
	284.000	I	98.96	108.72	96.73	70.45	99.05	73.57	115.26	72.86
	285.000	I	99.36	109.55	97.35	69.71	100.03	72.64	115.50	73.28
	286.000	I	99.77	110.37	97.97	68.98	101.02	71.70	115.73	73.70
	287.000	I	100.17	111.19	98.59	68.25	102.00	70.77	115.95	74.13
	288.000	I	100.57	112.02	99.21	67.53	102.99	69.84	116.17	74.56
	289.000	I	100.97	112.83	99.83	66.81	103.97	68.91	116.38	75.00
	290.000	I	101.37	113.65	100.45	66.10	104.96	67.98	116.58	75.45
	291.000	I	101.76	114.47	101.07	65.39	105.94	67.05	116.78	75.90
	292.000	I	102.15	115.28	101.69	64.68	106.93	66.13	116.97	76.35
	293.000	I	102.54	116.10	102.30	63.98	107.91	65.20	117.15	76.81
	294.000	I	102.93	116.91	102.91	63.29	108.90	64.28	117.33	77.27
	295.000	I	103.31	117.72	103.52	62.60	109.89	63.36	117.49	77.73
	296.000	I	103.69	118.52	104.13	61.92	110.87	62.44	117.65	78.20
	297.000	I	104.07	119.33	104.74	61.24	111.86	61.52	117.81	78.68
	298.000	I	104.45	120.13	105.35	60.57	112.84	60.61	117.95	79.16

299.000	I	104.82	120.93	105.95	59.90	113.83	59.69	118.09	79.64
300.000	I	105.19	121.72	106.55	59.25	114.81	58.78	118.22	80.12
301.000	I	105.56	122.52	107.15	58.60	115.80	57.87	118.34	80.61
302.000	I	105.92	123.31	107.75	57.95	116.78	56.96	118.46	81.10
303.000	I	106.28	124.09	108.34	57.32	117.77	56.06	118.56	81.60
304.000	I	106.63	124.88	108.93	56.69	118.75	55.15	118.66	82.10
305.000	I	106.99	125.66	109.52	56.07	119.74	54.25	118.75	82.60
306.000	I	107.33	126.43	110.10	55.46	120.73	53.35	118.83	83.10
307.000	I	107.68	127.21	110.68	54.86	121.71	52.46	118.91	83.61
308.000	I	108.02	127.97	111.26	54.26	122.70	51.57	118.97	84.12
309.000	I	108.35	128.74	111.83	53.68	123.68	50.68	119.03	84.63
310.000	I	108.68	129.50	112.40	53.11	124.67	49.79	119.08	85.15
311.000	I	109.01	130.25	112.97	52.54	125.65	48.91	119.12	85.66
312.000	I	109.33	131.00	113.53	51.99	126.64	48.03	119.15	86.18
313.000	I	109.65	131.74	114.08	51.44	127.62	47.16	119.18	86.70
314.000	I	109.96	132.48	114.64	50.91	128.61	46.29	119.19	87.22
315.000	I	110.27	133.21	115.18	50.39	129.59	45.43	119.20	87.75
316.000	I	110.57	133.93	115.73	49.88	130.58	44.57	119.20	88.27
317.000	I	110.87	134.65	116.27	49.38	131.56	43.71	119.19	88.80
318.000	I	111.16	135.36	116.80	48.90	132.54	42.86	119.17	89.33
319.000	I	111.45	136.06	117.32	48.43	133.53	42.02	119.15	89.86
320.000	I	111.73	136.75	117.85	47.97	134.51	41.18	119.11	90.39
321.000	I	112.00	137.44	118.36	47.52	135.49	40.35	119.07	90.92
322.000	I	112.27	138.11	118.87	47.09	136.48	39.52	119.02	91.45
323.000	I	112.53	138.78	119.37	46.68	137.46	38.71	118.96	91.98
324.000	I	112.79	139.44	119.87	46.28	138.44	37.90	118.89	92.52
325.000	I	113.04	140.08	120.36	45.89	139.42	37.10	118.82	93.05
326.000	I	113.28	140.72	120.84	45.52	140.40	36.30	118.73	93.58
327.000	I	113.52	141.34	121.31	45.16	141.38	35.52	118.64	94.12
328.000	I	113.75	141.95	121.78	44.82	142.36	34.75	118.53	94.65
329.000	I	113.98	142.54	122.24	44.50	143.34	33.98	118.42	95.18

330.000	114.19	143.12	122.69	44.19	144.32	33.23	118.30	95.71
331.000	114.40	143.69	123.13	43.91	145.30	32.49	118.18	96.25
332.000	114.61	144.24	123.56	43.63	146.27	31.77	118.04	96.78
333.000	114.80	144.78	123.99	43.38	147.25	31.05	117.90	97.31
334.000	114.99	145.30	124.40	43.15	148.22	30.36	117.74	97.84
335.000	115.17	145.80	124.81	42.93	149.20	29.67	117.58	98.36
336.000	115.35	146.28	125.20	42.73	150.17	29.01	117.42	98.89
337.000	115.51	146.74	125.59	42.55	151.14	28.36	117.24	99.42
338.000	115.67	147.18	125.96	42.39	152.10	27.73	117.05	99.94
339.000	115.82	147.60	126.33	42.25	153.07	27.13	116.86	100.46
340.000	115.96	148.00	126.68	42.13	154.03	26.54	116.66	100.98
341.000	116.10	148.37	127.03	42.02	154.99	25.98	116.45	101.50
342.000	116.22	148.72	127.36	41.94	155.95	25.45	116.23	102.01
343.000	116.34	149.05	127.68	41.88	156.91	24.94	116.01	102.52
344.000	116.45	149.35	127.99	41.84	157.86	24.46	115.77	103.03
345.000	116.55	149.62	128.28	41.81	158.80	24.01	115.53	103.54
346.000	116.64	149.86	128.56	41.81	159.74	23.59	115.29	104.04
347.000	116.73	150.08	128.83	41.82	160.68	23.21	115.03	104.54
348.000	116.80	150.27	129.09	41.86	161.61	22.86	114.77	105.04
349.000	116.87	150.42	129.33	41.91	162.53	22.54	114.50	105.53
350.000	116.93	150.55	129.56	41.99	163.44	22.27	114.22	106.02
351.000	116.97	150.65	129.78	42.08	164.34	22.03	113.93	106.51
352.000	117.01	150.71	129.98	42.19	165.23	21.84	113.64	106.99
353.000	117.04	150.74	130.17	42.32	166.11	21.69	113.34	107.47
354.000	117.07	150.75	130.34	42.47	166.96	21.58	113.04	107.94
355.000	117.08	150.72	130.50	42.64	167.79	21.51	112.72	108.41
356.000	117.08	150.65	130.64	42.83	168.60	21.49	112.40	108.87
357.000	117.07	150.56	130.77	43.03	169.37	21.52	112.08	109.33
358.000	117.06	150.44	130.89	43.25	170.11	21.58	111.74	109.78
359.000	117.03	150.28	130.98	43.49	170.79	21.69	111.40	110.23
360.000	117.00	150.10	131.07	43.75	171.41	21.85	111.05	110.67

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