67-FM-60

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MSC INTERNAL NOTE NO. 67-FM-60

Override 11/4-74

May 1, 1967

LANGLEY LUNAR ORBITER ORBIT DETERMINATION RESULTS

OCT 30 1968

By Jerome N. Engel
Mathematical Physics Branch

TECHNICAL LIBRARY
BELLCOMM, INC.
955 L'Enfant Plaza North, S.W.
Washington, D. C. 20024

MISSION PLANNING AND ANALYSIS DIVISION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MSC INTERNAL NOTE NO. 67-FM-60

PROJECT APOLLO

LANGLEY LUNAR ORBITER ORBIT DETERMINATION RESULTS

By Jerome N. Engel
Mathematical Physics Branch

May 1, 1967

MISSION PLANNING AND ANALYSIS DIVISION
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

Approved: _____
James C. McPherson, Chief
Mathematical Physics Branch

Approved: _____
John P. Mayer, Chief
Mission Planning and Analysis Division

TABLES

Table		Page
I	LANGLEY LUNAR ORBITER CASES	
	(a) Nominal CM Cases 1-6	7
	(b) Non-nominal CM Cases 7-11	7
	(c) Non-nominal CM Cases 12-17	8
	(d) Non-nominal CM Cases 18-23	8
	(e) Nominal LM Cases 24-29	9
	(f) Non-nominal LM Case 30	9
	(g) Non-nominal LM Case 31	9
II	DIFFERENCES BETWEEN THE CM ORBIT AND THE STANDARD TRAJECTORY (NO TRACKING)	10
III	DIFFERENCES BETWEEN THE STANDARD TRAJECTORY AND THE NOMINAL CM CASES	11
IV	DIFFERENCES BETWEEN THE STANDARD CM TRAJECTORY AND THE PERTURBED CM CASES	12
V	SUMMARY OF THE RESULTING DIFFERENCES BETWEEN THE CM ORBIT AND THE STANDARD WHEN P = 0, ΔS = (3.5KM; 3M/SEC)	13
VI	DIFFERENCES BETWEEN THE STANDARD LM TRAJECTORY AND THE LM CASES	14
VII	TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM	
	(a) Print Key	15
	(b) Definitions Of Symbols On Print Key	18
	(c) Constants And Conversion Factors	39
VIII	CORRECT STANDARD CM ORBIT	41
IX	OLD STANDARD CM ORBIT	60
X	NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC, ON $\dot{X}$, $\dot{Y}$, $\dot{Z}$)	
	(a) Case 1: 10-minute Arc Of 2- And 3-way Tracking	73

Table | Page

(b) Case 2: 20-minute Arc Of 2-way Tracking With 18 Minutes Of 3-way Tracking 78
(c) Case 3: 30-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking 83
(d) Case 4: 40-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking 88
(e) Case 5: 60-Minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking 93
(f) Case 6: 120-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking 98

XI NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC)

(a) Case 7: 10-minute Arc Of 2- And 3-way Tracking 104
(b) Case 8: 20-minute Arc Of 2-way Tracking With 18 Minutes Of 3-way Tracking 109
(c) Case 9: 60-minute Arc Of 2-way Tracking With 28 Minutes of 3-way Tracking 114
(d) Case 10: 10-minute Arc Of 2-way Tracking 119
(e) Case 11: 10-minute Arc Of 2- And 3-way Tracking; Solve For 3-way Bias 123

XII NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0

(a) Case 12: 10-minute Arc Of 2- And 3-way Tracking 128
(b) Case 13: 20-minute Arc Of 2-way Tracking with 18 minutes of 3-way Tracking 133
(c) Case 14: 30-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking 138
(d) Case 15: 40-minute Arc Of 2-way Tracking With 28 Minutes of 3-way Tracking 143
(e) Case 16: 60-minute Arc of 2-way Tracking With 28 Minutes of 3-way Tracking 148
(f) Case 17: 120-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking 153

Table		Page
XIII	NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC)	
	(a) Case 18: 10-minute Arc Of 2- And 3-way Tracking	159
	(b) Case 19: 20-minute Arc Of 2-way Tracking with 18 minutes of 3-way Tracking	164
	(c) Case 20: 30-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking	169
	(d) Case 21: 40-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking	174
	(e) Case 22: 60-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking	179
	(f) Case 23: 120-minute Arc Of 2-way Tracking With 28 Minutes Of 3-way Tracking	184
XIV	STANDARD LM ORBIT	187
XV	NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC)	
	(a) Case 24: 9-minute Arc Of 2- And 3-way Tracking	192
	(b) Case 25: 19-minute Arc Of 2- And 3-way Tracking	197
	(c) Case 26: 76-minute Arc Of 2-way Tracking With 69 Minutes of 3-way Tracking	202
	(d) Case 27: 9-minute Arc Of 2-way Tracking	209
	(e) Case 28: 19-minute Arc Of 2-way Tracking	213
	(f) Case 29: 76-minute Arc Of 2-way Tracking	217
XVI	NON-NOMINAL LM CASE WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC)	221
XVII	NON-NOMINAL LM CASE WITH P = (100KM; 40M/SEC) AND ΔS = (15KM; 12M/SEC, 12M/SEC, 30M/SEC)	226

FIGURES

Figure		Page
1	Differences in position and velocity from the standard CM orbit (no tracking)	231
2	Differences in radius, speed and flight-path angle from the standard CM orbit (no tracking)	232
3	Differences in position from the standard CM orbit at acquisition	233
4	Differences in position from the standard CM orbit at end of track	234
5	Differences in velocity from the standard CM orbit at acquisition	235
6	Differences in velocity from the standard CM orbit at end of track	236
7	Differences in radius from the standard CM orbit at acquisition	237
8	Differences in radius from the standard CM orbit at end of track	238
9	Differences in speed from the standard CM orbit at acquisition	239
10	Differences in speed from the standard CM orbit at end of track	240
11	Differences in flight-path angle from the standard CM orbit at acquisition	241
12	Differences in flight-path angle from the standard CM orbit at end of track	242

Figure | Page

13 Differences in position and velocity from the standard LM orbit (no tracking) 243

14 Differences in radius, speed and flight-path angle from the standard LM orbit (no tracking) 244

15 Difference in position from the standard LM orbit at acquisition 245

16 Difference in position from the standard LM orbit at end of track 246

17 Difference in velocity from the standard LM orbit at acquisition 247

18 Difference in velocity from the standard LM orbit at end of track 248

19 Difference in radius from the standard LM orbit at acquisition 249

20 Difference in radius from the standard LM orbit at end of track 250

21 Difference in speed from the standard LM orbit at acquisition 251

22 Difference in speed from the standard LM orbit at end of track 252

23 Difference in flight-path angle from the standard LM orbit at acquisition 253

24 Difference in flight-path angle from the standard LM orbit at end of track 254

LANGLEY LUNAR ORBITER ORBIT DETERMINATION RESULTS

By Jerome N. Engel

SUMMARY AND INTRODUCTION

This note presents the results of a study made to determine the accuracy with which lunar orbits can be predicted. Data from the Langley Lunar Orbiter were used to estimate trajectories similar to that of the command module (CM) when it first reappears from behind the moon and the lunar module (LM) immediately following insertion into a lunar orbit. The results indicate that it is not difficult to determine lunar orbits with a fair degree of accuracy. It was found that, for the cases considered, solving for a 3-way bias often had an appreciable effect on the deviations in position and velocity. This was particularly noticeable after 20 minutes of tracking. It was also shown that too tight a covariance matrix can increase the errors in the estimated orbit.

The results are based on actual Lunar Orbiter data obtained from Langley Research Center (ref. 1). Although preliminary results have been published in references 1, 2, and 3, this note is intended to present the detailed computations.

SYMBOLS

The symbols given below correspond to the symbols used in tables II through VI and in the STEP printouts, tables VIII through XVII.

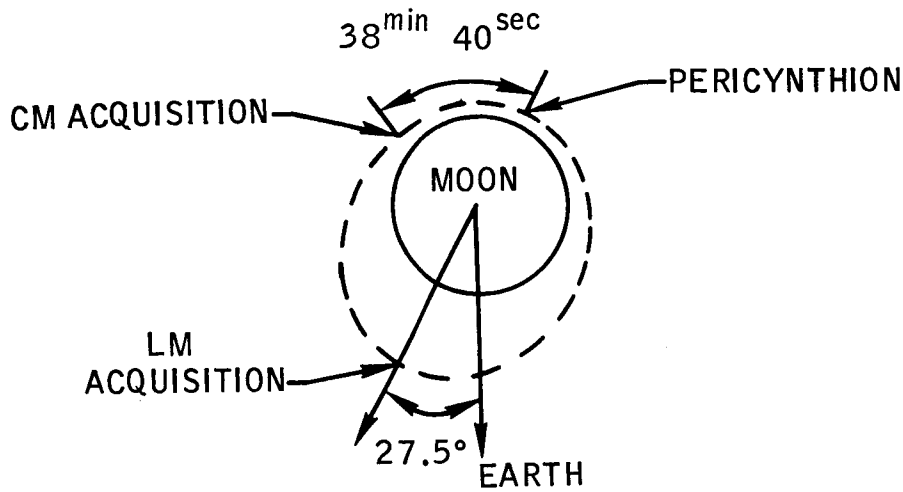
RAD, r	radius, ft
VEL, v	speed, fps
GAM, γ	flight-path angle, deg
PSI, ψ	heading angle, deg (measured east from north)
RAS, α	right ascension, deg
DEC, δ	declination, deg

ALT, h	altitude, ft
ROP, r_p	radius of perigee, ft
SMA, a	semimajor axis, ft
ECC, e	eccentricity , nd
INC, i	inclination, deg
MM	mean motion, deg/hr
ASN, Ω	longitude of the ascending node, deg
AOP, ω	argument of perigee, deg
TAN, η	true anomaly, deg
DR, $\lvert\Delta\bar{r}\rvert$	$\left[(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2\right]^{\frac{1}{2}}$, magnitude of the vectoral difference in position, ft
DV, $\lvert\Delta\bar{v}\rvert$	$\left[(\Delta \dot{x})^2 + (\Delta \dot{y})^2 + (\Delta \dot{z})^2\right]^{\frac{1}{2}}$, magnitude of the vectoral difference in velocity, fps

METHOD OF ANALYSIS

The data obtained from Langley Research Center consisted of a reference trajectory based on two- and three-way Doppler data taken for three revolutions of the Langley Lunar Orbiter. The orbit was redetermined using short arcs of data. The resulting position and velocity vectors were then compared with the standard trajectory. In addition to arc length, the errors introduced to the start vector and its associated weight (covariance matrix) were also varied.

Two periods of interest were considered for the study: one after the vehicle's first reappearance from behind the moon to simulate the CM orbit, and the other near the front of the moon to represent the LM orbit after lift-off from the lunar surface and insertion into lunar orbit. The CM was first acquired at the "side" of the moon 38 minutes 40 seconds after pericynthion; the LM was acquired near the front of the moon with the start vector near the time of the first observation. These conditions are shown in the sketch on the following page.



A direct comparison of the corrected anchor vector and the standard ephemeris was possible. In order to compute the deviaitons at the start and end of tracking it was necessary to propogate the initial state deviation to the appropriate times by predicting forward twice, once with each set of initial conditions. Initial unperturbed conditions for the command and lunar module orbits were:

Command Module

Epoch: August 14, 1966;

16:31:52.013 hr:min:sec G.m.t.

x, km	28.179165
y, km	1786.8292
z, km	722.03367
$\dot{x}$, km/s	-1.7708667
$\dot{y}$, km/s	0.197602
$\dot{z}$, km/s	-0.37465186
Declination, deg	25.396464
Longitude, deg	268.30375
Inclination, deg	12.22395

Lunar Module

Epoch: August 14, 1966

22:19:22.013 hr:min:sec G.m.t.

x, km	1039.5717
y, km	-3190.4982
z, km	-1009.0001
$\dot{x}$, km/s	0.88372715
$\dot{y}$, km/s	0.33821253
$\dot{z}$, km/s	0.36109416
Declination, deg	25.396464
Longitude, deg	268.30375
Inclination, deg	12.223944

Tracking Stations

Station No.	Station Name	r, ft	ϕ_c, deg	λ, deg
12	Goldstone	6371.878	35.117N	243.195
61	Madrid	6369.935	40.238N	355.751
41	Woomera	6372.613	31.212S	136.888

The command module was tracked by the Goldstone (2-way) and Madrid (3-way) stations; the lunar module, by the stations at Woomera (3-way) and Goldstone (2-way). Tracking data consisted of 2-way and 3-way Doppler taken at a rate of one per minute. The Doppler weight used was assumed to be 0.6 cps.

The differences between the standard and perturbed cases were calculated at the beginning and end of tracking. Differences were determined for seventeen elements that were thought to be of interest and are given in tables II through VI. The errors involving position ($|\Delta\bar{r}|$), velocity ($|\Delta\bar{v}|$), radius (Δr), speed (Δv), and flight-path angle ($\Delta\gamma$) are plotted in figures 1 through 23 for the cases listed in table I.

RESULTS

Table VI contains the definition of symbols and constants used in the standard CM and LM trajectories. Tables VIII and IX contain the standard CM orbits, and tables X through XIII present the CM cases 1 through 23. Table XIV contains the standard LM orbit, and tables XV through XVII present LM cases 24 through 31.

It was found that lunar orbits can be determined without much difficulty and with a fair degree of accuracy. Deviations in position and velocity varied from approximately 0.12 to 2.5 n. mi. and about 1.0 to 10.0 fps, respectively, for the CM. For the LM, these differences varied from about 0.13 to 1.0 n. mi., and 1.0 to 6.0 fps, respectively.

The effects of solving for the 3-way bias with a short data arc can be seen by comparing cases 7 and 10. Both cases have identical arc lenghts (10 minutes) but differ in the type of tracking. Case 7 uses both 2- and 3-way Doppler while case 10 uses only 2-way. The results indicate only minor deviations between the two particular cases.

The groups composed of cases 1 through 6, 12 through 17, and 18 through 23 differ in the error in their state vectors (ΔS) and covariance matrices (P), as shown in table I. The length and type of tracking are identical for each group. Both the second (cases 12-17) and third (cases 18-23) groups have zero covariance matrices but differ radically in the error in their state vectors (in group two, $\Delta S = 0$; in group three, $\Delta S = [3.5 \text{ km}; 3\text{m/s}]$). The results show almost identical deviations in position and veloctiy. Comparing these results with those obtained from group one (cases 1-6) where P = (2 km; 3m/s) and ΔS = (0.6 km; 2m/s, 3m/s, 3m/s on $\dot{x}$, $\dot{y}$, $\dot{z}$) shows that too tight a covariance matrix increased the error in the estimated orbit.

Comparison of non-nominal LM cases 30 and 31 indicates the effects of tight and loose covariance matrices on the position and velocity of the LM. The loose covariance matrix shows the lesser error.

TABLE I.- LANGLEY LUNAR ORBITER CASES

(a) Nominal CM cases 1 - 6

$P(x, y, z, \dot{x}, \dot{y}, \dot{z})^a = (2, 2, 2 \text{ km}; 3, 3, 3 \text{ m/sec})$

$\Delta S(x, y, z, \dot{x}, \dot{y}, \dot{z})^b = (0.6, 0.6, 0.6 \text{ km}; 2, 3, 3 \text{ m/sec})$

Case	Tracking
1	10 min, 2- and 3-way
2	20 min, 2-way; 18 min, 3-way
3	30 min, 2-way; 28 min, 3-way
4	40 min, 2-way; 28 min, 3-way
5	60 min, 2-way; 28 min, 3-way
6	120 min, 2-way; 28 min, 3-way

(b) Non-nominal CM cases 7 - 11

$P(x, y, z, \dot{x}, \dot{y}, \dot{z})^a = (9, 9, 9 \text{ km}; 12, 12, 12 \text{ m/sec})$

$\Delta S(x, y, z, \dot{x}, \dot{y}, \dot{z})^b = (15, 15, 15 \text{ km}; 12, 12, 12 \text{ m/sec})$

Case	Tracking
7	10 min, 2- and 3-way
8	20 min, 2-way; 18 min, 3-way
9	60 min, 2-way; 28 min, 3-way
10	10 min, 2-way
11[c]	10 min, 2- and 3-way

[a]Uncertainty in each component associated with the start vector.

[b]Perturbation to each component of the start vector.

[c]A 3-way bias was solved for this case.

TABLE I.- LANGLEY LUNAR ORBITER CASES - Continued

(c) Non-nominal CM cases 12 - 17

$P(x, y, z, \dot{x}, \dot{y}, \dot{z})^{a} = 0$

$\Delta S(x, y, z, \dot{x}, \dot{y}, \dot{z})^{b} = 0$

Case	Tracking
12	10 min, 2- and 3-way
13	20 min, 2-way; 18 min, 3-way
14	30 min, 2-way; 28 min, 3-way
15	40 min, 2-way; 28 min, 3-way
16	60 min, 2-way; 28 min, 3-way
17	120 min, 2-way; 28 min, 3-way

(d) Non-nominal CM cases 18 - 23

$P(x, y, z, \dot{x}, \dot{y}, \dot{z})^{a} = 0$

$\Delta S(x, y, z, \dot{x}, \dot{y}, \dot{z})^{b} = (3.5, 3.5, 3.5 \text{ km}; 3, 3, 3 \text{ m/sec})$

Case	Tracking
18	10 min, 2- and 3-way
19	20 min, 2-way; 18 min, 3-way
20	30 min, 2-way; 28 min, 3-way
21	40 min, 2-way; 28 min, 3-way
22	60 min, 2-way; 28 min, 3-way
23	120 min, 2-way; 28 min, 3-way

[a]Uncertainty in each component associated with the start vector.

[b]Perturbation to each component of the start vector.

TABLE I.- LANGLEY LUNAR ORBITER CASES - Concluded

(e) Nominal LM cases 24 - 29

$P(x, y, z, \dot{x}, \dot{y}, \dot{z})^a$ = (4, 4, 4 km; 6, 6, 6 m/sec)

$\Delta S(x, y, z, \dot{x}, \dot{y}, \dot{z})^b$ = (0.6, 0.6, 0.6 km; 2, 2, 2 m/sec)

Case	Tracking
24	9 min, 2- and 3-way
25	19 min, 2- and 3-way
26	76 min, 2-way; 69 min, 3-way
27	9 min, 2-way
28	19 min, 2-way
29	76 min, 2-way

(f) Non-nominal LM case[c] 30

$P(x, y, z, \dot{x}, \dot{y}, \dot{z})^a$ = (9, 9, 9 km; 12, 12, 12 m/sec)

$\Delta S(x, y, z, \dot{x}, \dot{y}, \dot{z})^b$ = (15, 15, 15 km; 12, 12, 12 m/sec)

Case	Tracking
30	9 min, 2- and 3-way

(g) Non-nominal LM case[d] 31

$P(x, y, z, \dot{x}, \dot{y}, \dot{z})^a$ = (100, 100, 100 km; 40, 40, 40 m/sec)

$\Delta S(x, y, z, \dot{x}, \dot{y}, \dot{z})^b$ = (15, 15, 15 km; 12, 12, 30 m/sec)

Case	Tracking
31	9 min, 2- and 3-way

[a]Uncertainty in each component associated with the start vector.

[b]Perturbation to each component of the start vector.

[c]Tight covariance matrix.

[d]Loose covariance matrix.

TABLE II.- DIFFERENCES BETWEEN THE CM ORBIT AND THE STANDARD TRAJECTORY (NO TRACKING)

Time, hr:min:sec	Time from epoch, hr:min:sec	$\lvert\Delta\bar{r}\rvert$, ft	$\lvert\Delta\bar{v}\rvert$, fps	Δr, ft	Δv, fps	$\Delta\gamma$, deg	Δt, deg	$\Delta\delta$, deg	$\Delta\alpha$, deg	Δa, ft	Δe, nd	Δi, deg	ΔMM, deg/hr	$\Delta\eta$, deg
16:31:52	0	3410.	15.389	2592.	3.307	-.072620	-.14092	.0097458	-.018925	29635.	.0019456	-.060128	-.48301	-.0056020
17:10:32[a]	38:40	21985.	5.976	7328.	3.208	.098547	-.0000076294	.10917	.085810	30198.	.0019556	-.059748	-.49292	-.0058099
17:20:32	48:40	23913.	8.449	12800.	1.620	.13169	.037682	.11036	.056253	30169.	.0019279	-.059817	-.49257	-.0079091
17:30:32	58:40	26480.	12.119	18868.	-.0377	.16219	.078606	.10418	.011663	30056.	.0019072	-.059871	-.49082	-.0098069
17:40:32	68:40	31295.	15.957	25392.	-1.826	.19041	.12035	.089523	-.042252	29931.	.0018967	-.059903	-.48881	-.010561
17:50:32	1:18:40	39189.	19.821	32328.	-3.825	.21550	.16007	.066050	-.10145	29817.	.0018946	-.059916	-.48732	-.010161
18:10:32	1:38:40	63878.	27.990	47434.	-8.744	.24865	.22450	-.0073999	-.22791	29640.	.0019046	-.059887	-.48405	-.0092878
19:10:32	2:38:40	197942.	76.418	100155.	-35.109	.055575	.15861	-.49389	-.82400	29453.	.0019149	-.059557	-.48081	-.028125

[a]Acquisition

TABLE III.- DIFFERENCES BETWEEN THE STANDARD TRAJECTORY AND THE NOMINAL CM CASES

Case No.	Arc, min	Time, hr:min:sec	$\lvert\Delta\bar{r}\rvert$, ft	$\lvert\Delta\bar{v}\rvert$, fps	Δv, fps	Δr, ft	$\Delta\gamma$, deg	$\Delta\psi$, deg	$\Delta\delta$, deg	$\Delta\alpha$, deg	Δa, ft	Δe, nd	Δi, deg	ΔMM, deg/hr	$\Delta\eta$, deg
1	10	17:10:32[a]	14510.	1.542	-0.0829	123.	.010744	-.0022011	.081637	.052313	-92.	.00017330	-.046486	.0015020	.00015598
		17:20:32	14722.	0.856	-0.263	510.	.0083354	.021917	.079752	.042494	-110.	.00014579	-.046561	.0018053	.00016555
2	20	17:10:32	9816.	1.512	-0.0998	-76.	.0049238	-.0071201	.055228	.035389	-601.	.000073221	-.036029	.0093534	.00019772
		17:30:32	9890	1.333	-0.219	53.	-.00060177	.023806	.051718	.022747	-723.	.000025071	-.036159	.011861	.00035967
3	30	17:10:32	6261.	0.831	0.0162	-62.	.0044184	-.0032358	.035570	.021997	-664.	.000072584	-.022129	.0010872	.000037849
		17:40:32	5594.	1.362	-0.134	110.	-.0011907	.024409	.028545	.0094662	-307.	.000014056	-.022282	.0050278	.00021532
4	40	17:10:32	6029.	0.789	0.0256	-69.	.0044074	-.0029945	.034286	.021118	-42.	.000072882	-.021220	.00067997	.000028044
		17:50:32	4518.	1.691	-0.130	27.	-.0028344	.029552	.022463	.0058651	-391.	.000012442	-.021395	.0064049	.00025968
5	60	17:10:32	3977.	0.614	0.102	-83.	.0035124	-.0031118	.0022930	.013365	263.	.000062864	-.015092	-.0043058	-.000074521
		18:10:32	1798.	1.380	-0.0513	-84.	-.0036218	.023632	.0086145	.0017014	-258.	.00001330	-.015246	.0042267	.00016910
6	120	17:10:32	3270.	0.710	0.0966	19.	.0020840	-.0051746	.018940	.010836	462.	.000040762	-.014574	-.0075798	-.000114-7
		19:10:32	2587.	1.140	0.310	-858.	-.0024822	.016231	-.0078211	.011364	-227.	.00001374	-.014-55	.0037241	.00030315

[a] Acquisition

TABLE IV.- DIFFERENCES BETWEEN THE STANDARD CM TRAJECTORY AND THE PERTURBED CM CASES

Case No.	Arc, in	Time, hr:min:sec	$\lvert\Delta\bar{r}\rvert$, ft	$\lvert\Delta\bar{v}\rvert$, fps	Δv, fps	Δr, ft	$\Delta\gamma$, deg	$\Delta\psi$, deg	$\Delta\delta$, deg	$\Delta\alpha$, deg	Δa ft	Δe, nd	Δi, deg	ΔMM, deg/hr	$\Delta\eta$, deg
7	10	17:10:32	8341.	14.024	4.121	463.	.089195	.12505	-.038128	-.041161	19028.	.0017419	.12211	-.31106	-.0047300
		17:20:32	14834.	13.562	2.198	5518.	.11539	.11356	-.068748	-.050316	19000.	.0017143	.12204	-.31070	-.0061919
8	20	17:10:32	2362.	2.089	0.362	-271.	.0088632	.020605	-.011678	-.010584	978.	.00016426	.023078	-.016032	-.00030167
		17:30:32	3982.	1.369	-0.00140	539.	.0086744	.012519	-.019878	-.010889	856.	.00011613	.022942	-.014026	-.00038067
9	60	17:10:32	866.	1.068	0.0985	-65.	.0034184	.011909	-.0035684	-.0046177	287.	.000061393	.011593	-.0046988	-.000076845
		18:10:32	2490.	0.0771	-0.0491	-69.	-.0035250	-.00067806	-.011900	-.0025940	-233.	.000011850	.011437	.0038185	.00016369
10[a]	10	17:10:32	10622.	12.957	7.331	785.	.10096	.018805	-.047992	-.052849	33824.	.0021572	.041556	-.55183	-.0088649
		17:20:32	13369.	13.883	5.001	7422.	.15083	.0030975	-.052402	-.045042	33792.	.0021293	.041481	-.55145	-.011411
11[b]	10	17:10:32	28854.	18.804	10.238	1256.	.12814	.030540	-.14625	-.12674	47679.	.0028129	.10514	-.77639	-.012503
		17:20:32	31555.	19.894	7.238	10018.	.19920	-.014846	-.15104	-.10670	47642.	.0027848	.10506	-.77600	-.016065
12[c]	10	17:10:32	2115.	1.847	0.364	-108.	.0080225	.017736	-.010838	-.0097675	1349.	.00015340	.020004	-.022106	-.00036846
		17:20:32	2885.	1.519	0.192	305.	.0085208	.014436	-.014589	-.010094	1331.	.00012589	.019927	-.021811	-.00047125
13[c]	20	17:10:32	846.	0.861	0.134	-118.	.0052288	.010671	.0053822	.0013752	324.	.000092529	.0056827	-.0053186	-.000089556
		17:30:32	352.	0.846	-0.0497	241.	.0028625	.012692	-.00028872	-.0015411	202.	.000044402	.0055182	-.0033150	-.000064433
14[c]	30	17:10:32	1176.	0.655	0.0743	-74.	.0041142	.0090408	.0072923	.0027695	160.	.000071112	.0033157	-.0026226	-.000036150
		17:40:32	288.	0.760	-0.0900	162.	-.00026882	.012710	-.00035143	-.0013409	-80.	.000012603	.0031505	.0013151	.00010328
15[c]	40	17:10:32	1215.	0.622	0.0566	-48.	.0038610	.0087805	.0075424	.0028706	142.	.000066265	.0029678	-.0023241	-.000024527
		17:50:32	561.	0.730	-0.0962	82.	-.0021077	.012573	-.0023491	-.017586	-207.	.0000058524	.0027916	.0033932	.00018159
16[c]	60	17:10:32	323.	0.802	0.0980	-52.	.0032151	.0092392	-.000015020	-.0021782	314.	.000058245	.0074844	-.0051384	-.000082523
		18:10:32	1785.	0.129	-0.0410	-68.	-.0034212	.0023479	-.0085127	-.0019264	-206.	.0000086874	.0073273	.0033836	.00015661
17[c]	120	17:10:32	640.	0.689	0.0884	36.	.0021005	.0074339	-.0023769	-.0036163	464.	.000040792	.0073183	-.0075970	-.00010949
		19:10:32	951.	0.648	0.313	-866.	-.0025098	-.0074148	-.00095475	-.00030744	-226.	.000013813	.0074349	.0037031	.00030744

[a] 2-way tracking only

[b] 2-way solve for 3-way bias

[c] $P = \Delta S = 0$

TABLE V.- SUMMARY OF THE RESULTING DIFFERENCES BETWEEN THE CM ORBIT AND THE STANDARD

WHEN P = 0, ΔS = (3.5KM; 3M/SEC)

Case No.	Arc, min	Time, hr:min:sec	$\lvert\Delta\bar{r}\rvert$, ft	$\lvert\Delta\bar{v}\rvert$, fps	Δr, ft	Δv, fps	$\Delta\gamma$, deg	$\Delta\psi$, deg	$\Delta\delta$, deg	$\Delta\alpha$, deg	Δa, ft	Δe, nd	Δi, deg	ΔMM, deg/hr	Δn, deg
18	10	17:10:32	2169.	1.840	-113.	0.361	-.0078864	.017620	-.010624	-.0099583	1323.	.00015085	.020085	-.021687	-.00015085
		17:20:32	2936.	1.505	293.	0.191	.0083539	.014222	-.014872	-.010223	1305.	.00012335	.020008	-.021387	-.00046425
19	20	17:10:32	837.	0.857	-117.	0.133	.0051820	.010615	.0053285	.0013447	322.	.000091705	.0056674	-.0052757	-.000088738
		17:30:32	351.	0.840	238.	-0.0491	.0028083	.012610	-.00030994	-.0015469	200.	.000043560	.0055332	-.0032730	-.000063077
20	30	17:10:32	1209.	0.744	-74.	0.0742	-.0041180	.0089417	.0074799	.0028992	160.	.000071172	.0031331	-.0026245	-.000036076
		17:40:32	271.	0.763	162.	-0.0903	-.00026691	.012774	-.00014877	-.0012665	-80.	.000012673	.0029688	.0013180	.00010348
21	40	17:10:32	1229.	0.607	-55.	0.0605	.0038207	.0086384	.0075917	.0030041	144.	.000065744	.0028272	-.0023594	-.000027612
		17:50:32	517.	0.729	76.	-0.0931	-.0020890	.012487	-.0022111	-.0015430	-205.	.000053346	.0026481	.0033607	.00017840
22	60	17:10:32	326.	0.803	-51.	0.0979	.0032053	.0092421	-.000047684	-.0021992	314.	.000058085	.0075042	-.0051441	-.000082552
		18:10:32	1786.	0.127	-69.	-0.0404	-.0034237	.0023088	-.0085225	-.0019226	-206.	.000085384	.0073483	.0033827	.00015659
23	120	17:10:32	612.	0.678	36.	0.0883	.0021009	.0073366	-.0022097	-.0035000	464.	.000040503	.0071483	-.0075998	-.00010940
		19:10:32	956.	0.641	-865.	0.313	-.0025098	-.0072289	-.0010147	.0020790	-226.	.000013513	.0072646	.0036955	.00030732

TABLE VI.-DIFFERENCES BETWEEN THE STANDARD LM TRAJECTORY AND THE LM CASES

Case No.	Arc, min	Time, hr:min:sec	$\lvert\Delta\bar{r}\rvert$, ft	$\lvert\Delta\bar{v}\rvert$, fps	Δv, fps	Δr, ft	$\Delta\gamma$, deg	$\Delta\omega$, deg	$\Delta\delta$, deg	$\Delta\alpha$, deg	Δa, ft	Δe, nd	Δi, deg	ΔMM, deg/hr	Δn, deg
24	10	22:19:22	1802.	5.775	5.452	-114.	-.0011488	-.031215	.0036688	-.0035373	17151.	-.0020602	.020807	-.28061	.0048035
		22:29:22	3076.	5.702	5.202	-70.	.035711	-.033319	.014988	.0052185	17121.	-.0020563	.020860	-.28010	.0048135
25	20	22:19:22	672.	0.843	0.193	-33.	-.0020593	.013677	.0033145	-.00046158	568.	-.000055388	-.012230	-.00932-1	.00023573
		22:39:22	524.	0.850	0.208	-136.	.00056517	.013275	-.00080299	.0026321	530.	-.000052340	-.012115	-.0086937	.00026554
26	76	22:19:22	812.	1.101	0.0697	-119.	.00042129	.017677	.0020931	.0035629	72.	-.000023317	-.014416	-.0011911	.000024069
		23:35:22	1941.	1.314	0.131	229.	-.00019544	-.0064344	-.015410	.0072522	1588.	.000001679	-.014454	-.026011	.00012032
27	10	22:19:22	1453.	9.288	9.182	224.	-.0021011	.021291	.0060000	.0040741	29459.	-.0034904	-.019571	-.48117	.0075083
		22:29:22	6536.	9.008	8.755	303.9	.060557	.015556	.012850	.031879	29429.	-.0034863	-.019514	-.48066	.0082013
28	20	22:19:22	1240.	1.840	0.218	2.	-.0021296	.029758	.0056415	.0026360	692.	-.000066403	-.025611	-.011356	.00026280
		22:39:22	1646.	1.788	0.227	-96.	.00091922	.028712	-.0038689	.0080490	654.	-.000063330	-.025[illegible]8	-.010720	.00029261
29	76	22:19:22	7054.	7.865	0.0683	-140.	.00057840	.12508	.028868	.020939	41.	-.000022855	-.11088	-.00068092	.000013888
		23:35:22	14151.	8.032	0.141	206.	-.00027013	-.040288	-.11712	.041381	1559.	.000022428	-.11089	-.025538	.00011625
30[a]	10	22:19:22	14830.	11.123	10.173	-1655.	.0038494	-.078079	.065585	-.034542	30268.	-.0038113	.016465	-.49433	.0078423
		22:29:22	17596.	10.620	9.681	-1397.	.070448	-.071304	.089537	-.011303	30239.	-.0038072	.016515	-.49382	.0086023
31[b]	10	22:19:22	2110.	1.953	-1.181	-178.	-.00085676	.025034	.010459	.00066757	-3956.	.00046627	-.025168	.064909	-.00092084
		22:29:22	1020.	2.061	-1.115	-232.	-.0091619	.026772	.0049340	-.0013695	-3987.	.00046978	-.025114	.065413	-.0010074

[a]Tight covariance matrix

[b]Loose covariance matrix

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a]

(a) Print Key

	Row	Column 1	2	3	4	5	6
	1	GME	J	H	D	RE	REM
	2	G	A	B	C	OME	AU
	3	GMM	GMS	GMV	GMA	GMB	GMJ
Group A	4	EGM	MGM	JA			RA
	5	C21	C31	C41	C22	C32	C42
	6	C33	C43	C44	S21	S31	S41
	7	S22	S32	S42	S33	S43	S44
	8	J20	J30	J40			
		INJECTION CONDITIONS		TARGET	JULIAN DATE	MONTH, DAY, YEAR	HR:MIN:SEC
Group B	9	SELENOCENTRIC	XO	YO	ZO	DXO	DYO	DZO
	10	CARTESIAN			TO	GHA	GHO
		TIME PAST INJECTION			JULIAN DATE	MONTH, DAY, YEAR	HR:MIN:SEC
		GEOCENTRIC				EQUATORIAL COORDINATES	
	11	X	Y	Z	DX	DY	DZ
	12	R	DEC	RA	V	PTH	AZ
	13	R	LAT	LON	VE	PTE	AZE
	14	XS	YS	ZS	DXS	DYS	DZS
Group C	15	XM	YM	ZM	DXM	DYM	DZM
	16	XT	YT	ZT	DXT	DYT	DZT
	17	RS	VS	RM	VM	RT	VT
	18	GED	ALT	LOS	RAS	RAM	LOM
	19	DUT	DT	DR	SHA	DES	DEM
	20	CCL	MCL	TCL			
				GEOCENTRIC CONIC			
		EPOCH PERICENTER PASSAGE			JULIAN DATE	MONTH, DAY, YEAR	HR:MIN:SEC
	21	SMA	ECC	B	SLR	APO	RCA
Group D	22	VH	C3	C1	TFP	TF	PER
	23	TA	MTA	EA	MA	C3J	TFI
				ALL VECTORS REFERENCED TO EARTH EQUATOR PLANE			

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(a) Print Key - Continued

	Row	Column 1	2	3	4	5	6
	24	X	Y	Z	DX	DY	DZ
	25	INC	LAN	APF	MX	MY	MZ
	26	WX	WY	WZ	PX	PY	PZ
Group E	27	QX	QY	QZ	RX	RY	RZ
	28	BX	BY	BZ	TX	TY	TZ
	29	DAP	RAP				
	30	BTQ	BRQ	B	THA		
		HELIOCENTRIC				EQUATORIAL COORDINATES	
	31	X	Y	Z	DX	DY	DZ
	32	R	LAT	LON	V	PTH	AZ
	33	XE	YE	ZE	DXE	DYE	DZE
	34	XT	YT	ZT	DXT	DYT	DZT
	35	LTE	LOE	LTT	LOT	RST	VST
Group F	36	EPS	ESP	SEP	EPM	EMP	MEP
	37	MPS	MSP	SMP	SEM	EMS	ESM
	38	RPM	SPN				
	39	GCE	GCT	SIP	CPT	SIN	
	40	REP	VEP	CPE	CPS		
		SELENOCENTRIC				EQUATORIAL COORDINATES	
	41	X	Y	Z	DX	DY	DZ
	42	R	DEC	RA	V	PTH	AZ
Group G	43	R	LAT	LON	VP	PTP	AZP
	44	LTS	LNS	LTE	LNE		
	45	ALT	SHA	ALP	DR	DP	ASD
	46	HGE	SVL	HNG	SIA		
				SELENOCENTRIC CONIC			
		EPOCH OF PERICENTER PASSAGE			JULIAN DATE	MONTH, DAY, YEAR	HR:MIN:SEC
	47	SMA	ECC	B	SLR	APO	RCA
	48	VH	C3	C1	TFP	TF	LTF
Group H	49	TA	MTA	EA	MA	C3J	TFI
	50	ZAE	ZAP	ZAC	DEF	IR	GP
	51	OP1	OY	OP2			

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Concluded

(a) Print Key - Concluded

Row		Column					
		1	2	3	4	5	6
					ALL VECTORS REFERENCED TO PRINCIPAL PLANE		
	52	X	Y	Z	DX	DY	DZ
	53	INC	LAN	APF	MX	MY	MZ
	54	WX	WY	WZ	PX	PY	PZ
	55	QX	QY	QZ	RX	RY	RZ
Group I	56	BX	BY	BZ	TX	TY	TZ
	57	SXI	SYI	SZI	DAI	RAI	
	58	SXO	SYO	SZO	DAO	RAO	
	59	ETE	ETS	ETC			
	60	BT-	BR-	B	THA		
Group J	61	XOCTAL YOCTAL	ZOCTAL	$\dot{X}$OCTAL	$\dot{Y}$OCTAL	$\dot{Z}$OCTAL	
	62		YYMMDDDHH	TTSSSSS		SOCTAL	

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a]

(b) Definition of symbols on print key

Group A

Row 1	GME	Universal gravitational constant times the mass of Earth, km^3/sec^2
	J	Coefficient of the second harmonic in the Earth's potential function
	H	Coefficient of the third harmonic in the Earth's potential function
	D	Coefficient of the fourth harmonic in the Earth's potential function
	RE	Earth radius used in the potential function, km
	REM	Conversion factor for converting lunar ephemerides into km
Row 2	G	Universal constant of gravitation, $km^3/kg\ sec^2$
	A, B, C	Moments of inertia about principal axis for the Moon, $kg\ km^2$
	OME	Sidereal rotation rate of the Earth, deg/sec
	AU	Astronomical unit, km

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group A - Continued

Row 3	GMM	Universal gravitational constant times the mass of Moon, km^3/sec^2
	GMS	Universal gravitational constant times the mass of Sun, km^3/sec^2
	GMV	Universal gravitational constant times the mass of Venus, km^3/sec^2
	GMA	Universal gravitational constant times the mass of Mars, km^3/sec^2
	GMB	Universal gravitational constant times the mass of Earth-Moon, km^3/sec^2
	GMJ	Universal gravitational constant times the mass of Jupiter, km^3/sec^2
Row 4	EGM	Universal gravitational constant times the mass of Earth used for scaling ephemeris, km^3/sec^2
	MGM	Universal gravitational constant times the mass of Moon used for scaling ephemeris, km^3/sec^2
	JA	Coefficient of second harmonic in Mars potential function
	RA	Mars radius used in the potential function

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group A - Concluded

Rows 5, 6, 7, and 8		Lunar harmonics

Group B

Injection conditions are vernal equinox Cartesian coordinates in a geocentric equatorial system. The principal direction X is the vernal equinox direction of date, and the principal plane XY is the equatorial plane of date. Z is along the direction of the Earth's spin axis of date.

Row 9	XO, YO, ZO	Cartesian components of the probe radius vector, km
	DXO, DYO, DZO	Cartesian components of the probe space-fixed velocity vector, km/sec
Row 10	TO	Time of injection in seconds past midnight of day before launch, sec
	GHA	HA of Greenwich at injection epoch, deg
	GHO	HA of Greenwich at midnight of day before launch, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group C

Inertial position and velocity of the probe, Sun, Moon and target body in a geocentric equatorial system. The principal direction X is the vernal equinox direction of date, and the principal plane XY is the equatorial plane of date. Z is along the direction of the Earth's spin axis of date. Miscellaneous parameters are also included.

Row 11	X, Y, Z	Cartesian components of the probe radius vector, km
	DX, DY, DZ	Cartesian components of the probe space-fixed velocity vector, km/sec
Row 12	R	Probe radius distance, km
	DEC	Probe declination angle, deg
	RA	Probe right-ascension angle, deg
	V	Probe space-fixed velocity, km/sec
	PTH	Pitch angle of the probe space-fixed velocity vector with respect to the local horizontal, deg
	AZ	Azimuth angle of the probe space-fixed velocity vector measured East of true North, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group C - Continued

Row 13	R	Probe radius distance, km
	LAT	Probe geocentric latitude, deg
	LON	Probe East longitude, deg
	VE	Probe Earth-fixed velocity, km/sec
	PTE	Pitch angle of the probe Earth-fixed velocity vector with respect to the local horizontal, deg
	AZE	Azimuth angle of the probe Earth-fixed velocity vector measured East of true North, deg
Row 14	XS, YS, ZS	Cartesian components of the Sun radius vector, km
	DXS, DYS, DZS	Cartesian components of the Sun space-fixed velocity vector, km/sec
Row 15	XM, YM, ZM	Cartesian components of the Moon radius vector, km
	DXM, DYM, DZM	Cartesian components of the Moon space-fixed velocity vector, km/sec

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group C - Continued

Row 16	XT, YT, ZT	Cartesian components of the target radius vector, km
	DXT, DYT, DZT	Cartesian components of the target space-fixed velocity vector, km/sec
Row 17	RS	Sun radius distance, km
	VS	Sun space-fixed velocity, km/sec
	RM	Moon radius distance, km
	VM	Moon space-fixed velocity, km/sec
	RT	Target radius distance, km
	VT	Target space-fixed velocity, km/sec
Row 18	GED	Geodetic latitude of the probe, deg
	ALT	Altitude of the probe above the Earth's surface, km
	LOS	East longitude of the Sun in coordinate system defined in Row 10, deg
	RAS	Right ascension of the Sun, deg
	RAM	Right ascension of the Moon, deg
	LOM	East longitude of the Moon in coordinate system defined in Row 13, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group C - Concluded

Row 19	DUT	Ephemeris time minus Universal Time, sec
	DT	Adams-Moulton stop size, sec
	DR	Radial velocity of probe, km/sec
	SHA	Sun shadow parameter, km
	DES	Declination of the Sun, deg
	DEM	Declination of the Moon, deg
Row 20	CCL	Canopus - clock angle, deg
	MCL	Moon - clock angle, deg
	TCL	Target - clock angle, deg

Group D

General characteristics of the geocentric conic

Row 21	SMA	Semimajor axis, km
	ECC	Eccentricity
	B	Magnitude of the impact parameter, km
	SLR	Semilatus rectum, km
	APO	Apogee distance, km
	RCA	Magnitude of the closest approach vector, km

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group D - Concluded

Row 22	VH	Hyperbolic excess speed, km/sec
	C3	Twice the energy (vis viva energy integral, km^2/sec^2)
	C1	Angular momentum, km^2/sec
	TFP	Time from pericenter passage, sec
	TF	Time from injection to pericenter passage, hr
	PER	Period, min
Row 23	TA	True anomaly, deg
	MTA	Maximum true anomaly, deg
	EA	Eccentric anomaly, deg
	MA	Mean anomaly, deg
	C3J	Earth-Moon Jacobi constant, km^2/sec^2
	TFI	Time from injection, hr

Group E

Characteristics of the Earth conic in the geocentric equatorial system described under Group B

---

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group E - Continued

Row 24	X, Y, Z	Cartesian components of the probe radius vector, km
	DX, DY, DZ	Cartesian components of the probe space-fixed velocity vector, km/sec
Row 25	INC	Inclination of the orbit plane to the equatorial plane, deg
	LAN	Longitude of the ascending node, deg
	APF	Argument of pericenter, deg
	MX, MY, MZ	Components of a unit vector which lies in the orbit plane and is normal to the radius vector R $M = W \times \frac{R}{\lvert R \rvert}$
Row 26	WX, WY, WZ	Components of a unit vector normal to the conic $W = \frac{R \times V}{\lvert R \times V \rvert}$
	PX, PY, PZ	Components of a unit vector in the direction of perigee

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group E - Concluded

Row 27	QX, QY, QZ	Components of a unit vector perpendicular to the perigee direction, vector P, and being in the orbit plane Q = W X P
	RX, RY, RZ	Components of the unit vector R**
Row 28	BX, BY, BZ	Components of the impact parameter B,** km
	TX, TY, TZ	Components of the unit vector T**
Row 29	DAP	Declination of the asymptote, deg
	RAP	Right ascension of the asymptote, deg
Row 30	BTQ	Projection of the impact parameters B** upon the vector T, km
	BRQ	Projection of the impact parameters B** upon the vector R, km
	B	The magnitude of the impact parameter, km
	THA	Angle between the parameter B** and the vector T measured clockwise from T, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group F

Inertial position and velocity of the probe, Sun, Moon, and target body in a heliocentric equatorial system. The principal direction X is the vernal equinox direction of date and the principal plane XY is the equatorial plane of date. Z is along the direction of the Earth's spin axis of date. Miscellaneous parameters are also included.

Row 31	X	Cartesian components of the probe radius vector, km
	Y	
	Z	
	DX	Cartesian components of the probe space-fixed velocity vector, km/sec
	DY	
	DZ	
Row 32	R	Sun-probe radius distance, km
	LAT	Probe celestial declination, deg
	LON	Probe celestial right ascension, deg
	V	Probe space-fixed velocity, km/sec
	PTH	Pitch angle of the probe space-fixed velocity vector with respect to the local horizontal, deg
	AZ	Azimuth angle of the probe space-fixed velocity vector measured East of true North, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group F - Continued

Row 33	XE	Cartesian components of the Earth radius vector, km
	YE	
	ZE	
	DXE	Cartesian components of the Earth space-fixed velocity vector, km/sec
	DYE	
	DZE	
Row 34	XT	Cartesian components of the target radius vector, km
	YT	
	ZT	
	DXT	Cartesian components of the target space-fixed velocity vector, km/sec
	DYT	
	DZT	
Row 35	LTE	Celestial latitude of the Earth, deg
	LOE	Celestial longitude of the Earth, deg
	LTT	Celestial latitude of the target, deg
	LOT	Celestial longitude of the target,deg
	RST	Sun-target range, km
	VST	Sun-target velocity, km/sec

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Row 36	EPS	Earth-probe-Sun angle, deg
	ESP	Earth-Sun-probe angle, deg
	SEP	Sun-Earth-probe angle, deg
	EPM	Earth-probe-Moon angle, deg
	EMP	Earth-Moon-probe angle, deg
	MEP	Moon-Earth-probe angle, deg
Row 37	MPS	Moon-probe-Sun angle, deg
	MSP	Moon-Sun-probe angle, deg
	SMP	Sun-Moon-probe angle, deg
	SEM	Sun-Earth-Moon angle, deg
	EMS	Earth-Moon-Sun angle, deg
	ESM	Earth-Sun-Moon angle, deg
Row 38	RPM	Probe-Moon Distance, km
	SPN	Sun-probe, nearlimb of Earth angle, deg
Row 39	GCE	Clock angle of Earth, deg
	GCT	Clock angle of target, deg
	SIP	Sun-probe, near limb of target angle, deg
	CPT	Canopus-probe-target angle, deg
	SIN	Canopus-probe, near limb of target angle, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group F - Concluded

Row 40	REP	Earth-probe distance, km
	VEP	Velocity of the probe with respect to the Earth, km/sec
	CPE	Canopus-probe-Earth angle, deg
	CPS	Canopus-probe-Sun angle, deg

Group G

Row 41, 42	Inertial position of probe in a selenocentric equatorial system. The principal direction X is the vernal equinox direction of date and the principal plan XY is the geocentric equatorial plane of date. Z is along the direction of the Earth's spin axis of date.
Row 43, 44, 45	Selenocentric-fixed spherical coordinates of the probe, Sun, and Earth in a selenocentric equatorial system. The principal direction X is in the direction of the mean Moon-Earth line. The principal plane XY is the mean selenocentric equatorial plane. Z is along the direction of the Moon's mean spin axis. Miscellaneous parameters are also included.

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group G - Continued

Row 41	X, Y, Z	Cartesian components of the probe radius vector, km
	DX, DY, DZ	Cartesian components of the probe velocity vector, km/sec
Row 42	R	Probe radius distance, km
	DEC	Probe declination angle, deg
	RA	Probe right-ascension angle, deg
	V	Probe space-fixed velocity, km/sec
	PTH	Pitch angle of the probe space-fixed velocity vector with respect to the local horizontal, deg
	AZ	Azimuth angle of the probe space-fixed velocity vector measured East of true North, deg
Row 43	R	Probe radius distance, km
	LAT	Probe selenocentric latitude, deg
	LON	Probe selenocentric East longitude, deg
	VP	Probe selenocentric-fixed velocity, km/sec
	PTP	Pitch angle of the probe selenocentric-fixed velocity vector with respect to the local horizontal, deg
	AZP	Azimuth angle of the probe selenocentric fixed velocity vector measured East of the Moon's mean spin axis, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group G - Concluded

Row 44	LTS	Selenocentric latitude of the Sun, deg
	LNS	Selenocentric longitude of the Sun, deg
	LTE	Selenocentric latitude of the Earth, deg
	LNE	Selenocentric longitude of the Earth, deg
Row 45	ALT	Altitude of the probe above the Moon's surface, km
	SHA	Sun shadow parameter, km
	ALP	Illuminated crescent orientation viewing angle, deg
	DR	First time derivative of the probe radius distance, km/sec
	DP	First time derivative of the probe radius direction, deg/sec
	ASD	Angular semidiameter of Moon as seen from the probe, deg
Row 46	HGE	Right ascension of Earth in probe coordinate system, deg
	SVL	Declination of the Moon in probe coordinate system, deg
	HNG	Right ascension of the Moon in probe coordinate system, deg
	SIA	Earth-probe-Moon angle minus ASD, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group H

Characteristics of the selenocentric conic in the geocentric equatorial system described under Group B, except centered at the Moon.

Row 47	SMA	Semimajor axis, km
	ECC	Eccentricity
	B	The magnitude of the impact parameter, km
	SLR	Semilatus rectum, km
	APO	Apogee distance, km
	RCA	Magnitude of the closest approach vector, km
Row 48	VH	Hyperbolic excess speed, km/sec
	C3	Twice the energy(vis viva energy integral, km^2/sec^2)
	C1	Angular momentum, km^2/sec
	TFP	Time from pericenter passage, sec
	TF	Time from injection to pericenter passage, hr
	LTF	Linearized time-of-flight, hr

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group H - Continued

Row 49	TA	True anomaly, deg
	MTA	Maximum true anomaly, deg
	EA	Eccentric anomaly, deg
	MA	Mean anomaly, deg
	C3J	Earth-Moon Jacobi constant, km^2/sec^2
	TFI	Time from injection, hr
Row 50	ZAE	Angle between the incoming asymptote and the Moon-Earth vector, deg
	ZAP	Angle between the incoming asymptote and the Moon-Sun vector, deg
	ZAC	Angle between the incoming asymptote and the Moon-Canopus vector, deg
	DEF	Angle between the incoming and outgoing asymptotes, deg
	IR	Maximum B vector magnitude for lunar impact, km
	GP	Angle between the incoming asymptote and its projection on the lunar orbit plane.

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group H - Concluded

Row 51	OP1	Spacecraft nominal terminal maneuver first pitch turn, deg
	OY	Spacecraft nominal terminal maneuver yaw turn, deg
	OP2	Spacecraft nominal terminal maneuver second pitch turn, deg

Group I

Characteristics of the selenocentric conic in the specified "principal plane" coordinate system

Row 52	X, Y, Z	Cartesian components of the probe radius vector, km
	DX, DY, DZ	Cartesian components of the probe space-fixed velocity vector, km/sec
Row 53	INC	Inclination of the orbit plane to the equatorial plane, deg
	LAN	Longitude of the ascending node, deg
	APF	Argument of pericenter, deg
	MX, MY, MZ	Components of a unit vector which lies in the orbit plane and is normal to the radius vector R $M = W \times \frac{R}{\lvert R \rvert}$

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Continued

(b) Definition of symbols on print key - continued

Group I - Continued

Row 54	WX, WY, WZ	Components of a unit vector normal to the conic $W = \frac{R \times V}{\lvert R \times V \rvert}$
	PX, PY, PZ	Components of a unit vector in the direction of perigee
Row 55	QX, QY, QZ	Components of a unit vector perpendicular to the perigee direction, vector P, and being in the orbit plane $Q = W \times P$
	RX, RY, RZ	Components of the unit vector R
Row 56	BX, BY, BZ	Components of the impact parameter B, km
	TX, TY, TZ	Components of the unit vector T

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Concluded

(b) Definition of symbols on print key - concluded

Group I - Concluded

Row 57	SXI, SYI, SZI	Components of the unit vector S_I along the direction of the incoming asymptote
	DAI	Declination of the outgoing asymptote, deg
	RAI	Right ascension of the incoming asymptote, deg
Row 58	SXO, SYO, SZO	Components of the unit vector S_o along the direction of the outgoing asymptote
	DAO	Declination of the outgoing asymptote, deg
	RAO	Right ascension of the outgoing asymptote, deg
Row 59	ETE	Angle between the T vector and the projection of the Moon-Earth vector on the R-T plane, deg
	ETS	Angle between the T vector and the projection of the Moon-Sun vector on the R-T plane, deg
	ETC	Angle between the T vector and the projection of the Moon-Canopus vector on the R-T plane, deg

[a]Taken from references 4 and 5.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a]

(c) Constants and conversion factors

Constants	Conversion factors	Constants	Conversion factors
GM_{Sun}	$1.32715445 \times 10^{11}$ km^3/sec^2	Moon moments of inertia about principal axis	$A = 0.88746 \times 10^{29}$ kg km^2
GM_{Venus}	3.247695×10^5 km^3/sec^2		$B = 0.88764 \times 10^{29}$ kg km^2
GM_{Earth}[b]	3.986032×10^5 km^3/sec^2		$C = 0.88801 \times 10^{29}$ kg km^2
$GM_{Earth - Moon}$	4.03503×10^5 km^3/sec^2	Lunar and solar ephemerides	The Moon and Sun positions are obtained from the joint JPL-STL ephemerides. For purposes of converting into kilometers, the conversion factors are: 1 AU = 1.495990×10^8 km; 1 e.r. = 6378.3149
GM_{Moon}[c]	4.900759×10^3 km^3/sec^2		
GM_{Mars}	4.297780×10^4 km^3/sec^2		
$GM_{Jupiter}$	1.267106×10^8 km^3/sec^2		
M_{Sun}/M_{Venus}	408645		
M_{Sun}/M_{Earth}	332951.3		
M_{Earth}/M_{Moon}	81.335	Geometrical Earth model, used in locating tracking and launching facilities upon the Earth	Clarke spheroid of 1866
$M_{Sun}/M_{Earth-Moon}$	328908		a = 6378.2064 km
M_{Sun}/M_{Mars}	3 088 000		b = 6356.5838 km
$M_{Sun}/M_{Jupiter}$	1047.39		$e^2 = 0.006768657997291$
Equatorial radius of Earth	6378.3149 km	Earth potential functions =	
1 AU	1.495990×10^8 km	$(R, \phi) = \frac{GM_{Earth}}{R}\left[1 + \frac{JR_E^2}{3R^2}(1 - 3\sin^2\phi) + \frac{H}{5}\frac{R_E^3}{R^3}(3 - 5\sin^2\phi)\sin\phi + \frac{D}{35}\frac{R_E^4}{R^4}(3 - 30\sin^2\phi + 35\sin^4\phi)\right]$	
Ellipticity of Earth	1/298.3		
Conversion from feet to meters	0.3048		

[a]Taken from references 4 and 5.

[b]3.9860005×10^3 km^3/sec^2 was used for the premidcourse orbit.

[c]4.9007604×10^3 km^3/sec^2 was used for the premidcourse orbit.

TABLE VII.- TRAJECTORY PRINT KEY, DEFINITIONS AND CONSTANTS FOR JPL PROGRAM[a] - Concluded

(c) Constants and conversion factors - concluded

Constants	Conversion factors	Constants	Conversion factors
Atmospheric model	1959 ARDC	where	
Sidereal rotation rate of Earth	4.1780742×10^{-3} deg/sec	R = geocentric distance	
Universal constant of gravitation	6.671×10^{-20} $km^3/kg\ sec^2$	ϕ = geocentric latitude	
Speed of light	2.997925×10^{5} km/sec	$J = 1.62345 \times 10^{-3}$	
Mean Moon radius	1738.09 km	$H = -0.575 \times 10^{-3}$	
		$D = 0.7875 \times 10^{-5}$	

[a]Taken from references 4 and 5.

TABLE VIII.- CORRECT STANDARD CM ORBIT

[S[redacted]iteration vector]

DOUBLE PRECISION EPHEMERIS TAPE - EPHEM1

GME	.39860128 06	J	.16234500-02	H	-.57499999-05	D	.78749999-05	RE	.63781650 04	REM	.63783143 04
G	.66709998-19	A	.88781796 29	B	.88800194 29	C	.88836976 29	OME	.41780741-07	AU	.14959850 09
GMM	.49025800 04	GMS	.13271544 12	GMV	.32476950 06	GMA	.42977799 05	GMC	.37918700 08	GMJ	.12671060 09
EGM	.39860128 06	MGM	.49025800 04	JA	.29200000-02	HA	.00000000 00	DA	.00000000 00	RA	.34170000 04
C21	-.41379999-04	C31	.39440000-04	C41	-.36950000-04	C22	.22580000-04	C32	.26890000-04	C42	-.13840000-04
C33	.20560000-06	C43	.11770000-05	C44	.34600000-07	S21	.28760000-04	S31	.18620000-04	S41	.33639999-04
S22	.70119999-05	S32	.36110000-04	S42	.17690000-04	S33	-.60489999-05	S43	.42350000-06	S44	-.41470000-06
J20	.20480000-03	J30	-.15000000-04	J40	.00000000 00						

INJECTION CONDITIONS 1950.0 MOON 235764100776202001523000 J.D.= 2439352.18879644 AUG. 14,1966 16 31 52.013

SELENOCENTRIC X0 .35870719 02 Y0 .17667325 04 Z0 .72193163 03 DX0-.17707255 01 DY0 .20407504 00 DZ0-.37183871 00
CARTESIAN T0 .59512012 05 GHA .21061189 03 GHO .32196625 03
DATE OF RUN 120164P -1PM24

MOON IS THE CENTRAL BODY FOR INTEGRATION COWELL EQUATIONS OF MOTION

0 DAYS 0 HRS. 0 MIN. 0.000 SEC. 235764100776202001523000 J.D.= 2439352.18879644 AUG. 14,1966 16 31 52.013

GEOCENTRIC — EQUATORIAL COORDINATES

X	-.15982834 06	Y	.28934169 06	Z	.15693197 06	DX	-.27156517 01	DY	-.29691350 00	DZ	-.55073272 00
R	.36591167 06	DEC	.25396464 02	RA	.11891565 03	V	.27367953 01	PTH	.14870777 02	AZ	.11063470 03
R	.36591167 06	LAT	.25396464 02	LON	.26830375 03	VE	.21616164 02	PTE	.18960613 01	AZE	.26748186 03
XS	-.11847375 09	YS	.86667606 08	ZS	.37586152 08	DXS	-.18097419 02	DYS	-.21276313 02	DZS	-.92266068 01
XM	-.15985652 06	YM	.28755485 06	ZM	.15620993 06	DXM	-.94478511 00	DYM	-.49451562 00	DZM	-.17608050 00
XT	-.15985652 06	YT	.28755485 06	ZT	.15620993 06	DXT	-.94478511 00	DYT	-.49451562 00	DZT	-.17608000 00
RS	.15152565 09	VS	.29416464 02	RM	.36420247 06	VM	.10808187 01	RT	.36420247 06	VT	.10808187 01
GED	.25547551 02	ALT	.35953743 06	LOS	.29320135 03	RAS	.14381325 03	RAM	.11907041 03	LOM	.26845850 03
DUT	.36600000 02	DT	.18750000 02	DR	.71520286 00	SHA	-.15936115 06	DES	.14362234 02	DEM	.25398381 02
CCL	.27179108 03	MCL	.19224481 03	TCL	.19224481 03						

HELIOCENTRIC — EQUATORIAL COORDINATES

X	.11831392 09	Y	-.86378265 08	Z	-.37429220 08	DX	.15381767 02	DY	.20979400 02	DZ	.86758741 01
R	.15119634 09	LAT	-.14332801 02	LON	.32386768 03	V	.27422705 02	PTH	-.43850975 01	AZ	.72066990 02
XE	.11847375 09	YE	-.86667606 08	ZE	-.37586152 08	DXE	.18097419 02	DYE	.21276313 02	DZE	.92266068 01
XT	.11831389 09	YT	-.86380052 08	ZT	-.37429943 08	DXT	.17152634 02	DYT	.20781798 02	DZT	.90505260 01
LTE	-.14362234 02	LCE	.32381324 03	LTT	-.14332570 02	LOT	.32386710 03	RST	.15119752 09	VST	.28425481 02
EPS	.15412134 03	ESP	.60165642-01	SEP	.25818265 02	EPM	.27458158 02	EMP	.15240203 03	MEP	.13988231 00
MPS	.12765661 03	MSP	.27453512-18	SMP	.52342808 02	SEM	.25588096 02	EMS	.15425208 03	ESM	.60165642-01
RPM	.19274036 04	SPN	.15312260 03								
GCE	.88208518 02	GCT	.10045374 03	SIP	.63263856 02	CPT	.10505609 03	SIN	.40703337 02		
REP	.36591167 06	VEP	.27867953 01	CPE	.99364642 02	CPS	.78713094 02				

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

SELENOCENTRIC CONIC

EPOCH OF PERICENTER PASSAGE 2357641007632023315456 20 J.D.= 2439352.18830672 AUG. 14,1966 16 31 09.701

SPA	.27669142 C4	ECC	.30354005 C0	B	.26363670 C4	SLR	.25115802 04	APO	.36067834 04	RCA	.19270450 04
VH	.97297210 00	C3	-.17718584 C1	C1	.35092997 04	TFP	.42312213 02	TF	-.48972468-02	PER	.21767562 03
TA	.22907143 C1	MTA	.18000000 C3	EA	.16744951 C1	MA	.11662917 01			TFI	.00000000 00
								C3J	-.51939616 01		

ALL VECTORS REFERENCED TO EARTH EQUATOR PLANE

X	.28179289 C2	Y	.17868291 04	Z	.72203371 C3	DX	-.17708666 01	DY	.19760211 00	DZ	-.37465182 00
INC	.25410277 C2	LAN	.32736310 C3	APE	.11689661 C3	MX	-.97274461 00	MY	.99898414-01	MZ	-.20925636 00
WX	-.23141772 00	WY	-.36134501 00	WZ	.90325833 C0	PX	.53489079-01	PY	.92233143 00	PZ	.38267921 00
QX	-.97138276 C0	QY	.13687321 00	QZ	-.19411582 C0	RX	.22155619-01	RY	.38203730 00	RZ	-.92388113 00
BX	.97138292 00	BY	-.13687323 00	BZ	.19411585 C0	TX	.99832262 00	TY	-.57896061-01	TZ	.00000000 00
DAP	.22499738 C2	RAP	.86680541 02								

BTQ	.25775179 C4	BRQ	-.55392461 C3	B	.26363670 C4	THA	.34787125 03

T VECTOR IN EARTH EQUATOR PLANE

BTC	.25640723 C4	BRC	-.61316018 C3	B	.26363673 C4	THA	.34655112 03

T VECTOR IN ECLIPTIC PLANE

ALL VECTORS REFERENCED TO TRUE TARGET EQU. PLANE AND NODE

X	.15141584 C4	Y	.11924356 04	Z	-.17468559 02	DX	-.10904235 01	DY	.14063746 01	DZ	-.38531129 00
INC	.12223950 C2	LAN	.21582352 03	APE	.18016258 03	MX	-.60620372 00	MY	.76666040 00	MZ	-.21153918 00
WX	-.12392550 C0	WY	.17167832 C0	WZ	.97732747 00	PX	.80919686 00	PY	.58753697 00	PZ	-.60085579-03
QX	-.57431918 00	QY	.79077587 C0	QZ	-.21173237 00	RX	-.48621081-03	RY	-.35302512-03	RZ	-.99999962 00
RX	.57431930 00	RY	-.79077604 C0	BZ	.21173241 00	TX	.58753719 00	TY	-.80919717 00	TZ	.00000000 00
DAP	-.34428421-01	RAP	.35982434 02								

BTT	.25765516 C4	BRT	-.55820371 C3	B	.26363641 C4	THA	.34777610 03

T VECTOR IN TRUE TARGET EQU. PLANE

SELENOCENTRIC EQUATORIAL COORDINATES

X	.28179289 C2	Y	.17868291 C4	Z	.72203371 C3	DX	-.17708666 01	DY	.19760211 00	DZ	-.37465182 00
R	.19274036 C4	DEC	.22000499 02	RA	.89096487 C2	V	.18208183 01	PTH	.53335325 00	AZ	.10304351 03
R	.19274033 C4	LAT	-.51929330 C0	LON	.14819056 C3	VP	.18158166 01	PTP	.53482003 00	AZP	.10224724 03
LTS	.14949602 C1	LNS	.20049537 C3	LTE	-.59133335 C1	INF	.35507299 03				
ALT	.18931366 C3	SHA	-.15258873 C4	ALP	.17890046 C3	DR	.16949327-01	DP	.54124977-01	ASO	.44392754 02
HGE	.20587865 C3	SVL	-.96662228 C1	HNG	.23170385 C3	SIA	-.36934596 02				

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

0 DAYS 1 HRS. 48 MIN. 3.352 SEC. 23576410412220265657442 6 J.D.= 2439352.26383523 AUG. 14,1966 18 19 55.365

GEOCENTRIC — EQUATORIAL COORDINATES

X	-.16614286 06	Y	.28097427 06	Z	.15366349 06	DX	.10057330-01	DY	-.64212038 00	DZ	.47100354-02
R	.36078035 06	DEC	.25208898 02	RA	.12059624 03	V	.64221640 00	PTH	-.51514668 02	AZ	.52759956 02
R	.36078034 06	LAT	.25208898 02	LON	.24289642 03	VE	.23491371 02	PTE	-.12261999 01	AZE	.27059003 03
XS	-.11859099 09	YS	.86525586 08	ZS	.37526301 08	DXS	-.18067994 02	DYS	-.21297920 02	DZS	-.92359988 01
XM	-.16595396 06	YM	.28425860 06	ZM	.15504104 06	DXM	-.93610255 00	DYM	-.50995176 00	DZM	-.18449804 00
XT	-.16595396 06	YT	.28425860 06	ZT	.15504104 06	DXT	-.93610255 00	DYT	-.50995176 00	DZT	-.18449804 00
RS	.15152365 09	VS	.29416559 02	RM	.36387379 06	VM	.10818402 01	RT	.36387379 06	VT	.10818402 01
GED	.25359177 02	ALT	.35440605 06	LOS	.26618392 03	RAS	.14388374 03	RAM	.12027344 03	LOM	.24257362 03
DUT	.36600000 02	DT	.75000000 02	DR	-.50270614 00	SHA	-.14906958 06	DES	.14339067 02	DEM	.25215338 02
CCI	.27263625 03	MCL	.12430650 02	TCL	.12430650 02						

HELIOCENTRIC — EQUATORIAL COORDINATES

X	.11842485 09	Y	-.86248612 08	Z	-.37372637 08	DX	.18078051 02	DY	.20655800 02	DZ	.92407089 01
R	.15119518 09	LAT	-.14310785 02	LON	.22393421 03	V	.29963233 02	PTH	.18326422 00	AZ	.70726079 02
XE	.11859099 09	YE	-.86525586 08	ZE	-.37526301 08	DXE	.18067994 02	DYE	.21297920 02	DZE	.92359988 01
XT	.11842504 09	YT	-.86245289 08	ZT	-.37371260 08	DXT	.17131891 02	DYT	.20787969 02	DZT	.90515009 01
LTE	-.14339067 02	LOE	.32388374 03	LTT	-.14310447 02	LOT	.32393530 03	RST	.15119309 09	VST	.28417794 02
EPS	.15553827 03	ESP	.55514057-01	SEP	.24405235 02	EPM	.14899976 03	EMP	.30708006 02	MEP	.25225050 00
MPS	.54570461 02	MSP	.27453512-18	SMP	.12542842 03	SEM	.24680187 02	EMS	.15526223 03	ESM	.57674939-01
RPM	.36033957 04	SPN	.15452532 03								
GCE	.87363748 02	GCT	.27979440 03	SIP	.25731608 02	CPT	.75564080 02	SIN	.46725227 02		
REP	.36078035 06	VEP	.64221640 00	CPE	.99167302 02	CPS	.78723213 02				

SELENOCENTRIC — EQUATORIAL COORDINATES

X	-.18889991 03	Y	-.33243274 04	Z	-.13775430 04	DX	.94615988 00	DY	-.13216862 00	DZ	.18920807 00
R	.36033957 04	DEC	-.22475617 02	RA	.26674774 03	V	.97390284 00	PTH	-.54790734-07	AZ	.77863105 02
R	.36033952 04	LAT	.58335791-01	LON	.32502472 03	VP	.95455320 00	PTP	-.11897436-05	AZP	.77672832 02
LTS	.14946008 01	LNS	.19958054 03	LTE	-.59648520 01	LNE	.35515130 03				
ALT	.18653057 04	SHA	.29361522 04	ALP	.65240850 00	DR	.00000000 00	DP	.15485538-01	ASD	.28838854 02
HGE	.20446172 03	SVL	.10101838 02	HNG	.53925999 02	SIA	.12016090 03				

SELENOCENTRIC CONIC

EPOCH OF PERICENTER PASSAGE 23576410076320223235042 6 J.D.= 2439352.18830100 AUG. 14,1966 16 31 00.707

SMA	.27657531 04	ECC	.30286240 00	B	.26358574 04	SLR	.25120627 04	APO	.36033957 04	RCA	.19091105 04
VH	.97390279 00	C3	-.17726022 01	C1	.35093573 04	TFP	.65261585 04	TF	-.49544374-03	PER	.21753863 03
TA	.17999999 03	MTA	.18000000 03	EA	.17999999 03	MA	.17999999 03			TFI	.75038797-01
								C3J	-.50752387 01		

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

ALL VECTORS REFERENCED TO EARTH EQUATOR PLANE

X	-.18889991 C3	Y	-.33243274 C4	Z	-.13775430 C4	DX	.94615988 00	DY	-.13216862 00	DZ	.18920807 00
INC	.25392938 C2	LAN	.32738808 C3	APE	.11693947 C3	MX	.97151360 00	MY	-.13571027 00	MZ	.19427818 00
WX	-.23111284 C0	WY	-.36121557 C0	WZ	.90338815 C0	PX	.52422745-01	PY	.92255402 00	PZ	.38229021 00
QX	-.57151356 00	QY	.13571025 C0	QZ	-.19427817 C0	RX	.21688080-01	RY	.38167451 00	RZ	-.92404223 00
RX	.97151362 C0	RY	-.13571027 C0	RZ	.19427818 C0	TX	.99838945 00	TY	-.56731979-01	TZ	.00000000 00
DAP	.22475617 C2	RAP	.86747149 C2								

BTQ	.25769408 C4	BRC	-.55418408 C3	B	.26358574 C4	THA	.34786310 03	T VECTOR IN EARTH EQUATOR PLANE
BTC	.25637731 04	BRC	-.61221741 C3	B	.26358571 C4	THA	.34656954 03	T VECTOR IN ECLIPTIC PLANE

ALL VECTORS REFERENCED TO TRUE TARGET EQU. PLANE AND NODE

X	-.29130524 C4	Y	-.21209830 C4	Z	.36687012 C1	DX	.56045453 00	DY	-.76939697 00	DZ	.20592585 00
INC	.12207130 C2	LAN	.21578657 C3	APE	.18027587 C3	MX	.57547280 00	MY	-.79001420 00	MZ	.21144397 00
WX	-.12365303 C0	WY	.17152118 00	WZ	.97738959 00	PX	.80841880 00	PY	.58860675 00	PZ	-.10181128-02
QX	-.57547272 C0	QY	.79001421 00	QZ	-.21144396 00	RX	-.82306200-03	RY	-.59926841-03	RZ	-.99999942 00
RX	.57547277 00	RY	-.79001427 C0	RZ	.21144398 00	TX	.58860708 00	TY	-.80841926 00	TZ	.00000000 00
DAP	-.58334937-C1	RAP	.36058225 02								

BTT	.25762594 C4	BRT	-.55733607 03	B	.26358558 C4	THA	.34779301 03	T VECTOR IN TRUE TARGET EQU. PLANE

D-DAYS 12 HRS. 3 MIN. 30.000 SEC. 2357641261422024015463 11 J.D.= 2439352.69122700 AUG. 15,1966 04 35 22.013

GEOCENTRIC EQUATORIAL COORDINATES

X	-.20156650 06	Y	.26167773 C6	Z	.14595223 06	DX	-.23912592 00	DY	-.14545216 01	DZ	-.41056845 00
R	.36111819 C6	DEC	.23838569 C2	RA	.12760453 C3	V	.15301571 01	PTH	-.45237350 02	AZ	.88340461 02
R	.36111818 C6	LAT	.23838569 C2	LON	.95624401 C2	VE	.23035155 02	PTE	-.27033684 01	AZE	.27007770 03
XS	-.11925512 C9	YS	.85740805 C8	ZS	.37184252 C8	DXS	-.17399744 02	DYS	-.21420315 02	DZS	-.92892053 01
XM	-.19951954 C6	YM	.26388161 C6	ZM	.14735486 C6	DXM	-.87397083 00	DYM	-.59499075 00	DZM	-.23150565 00
XT	-.19951954 06	YT	.26388161 06	ZT	.14735486 C6	DXT	-.87397083 00	DYT	-.59499075 00	DZT	-.23150565 00
RS	.15151217 09	VS	.29415722 C2	RM	.36215328 C6	VM	.10871787 01	RT	.36215328 06	VT	.10871787 01
GED	.23983155 C2	ALT	.35474351 06	LOS	.11230288 C3	RAS	.14428501 03	RAM	.12709274 03	LOM	.95110611 02
DUT	.36600000 C2	DT	.75000000 C2	DR	-.10864574 C1	SHA	-.11428759 06	DES	.14206707 02	DEM	.24009326 02
CCL	.27637583 C3	MCL	.80118079 C1	TCL	.80118079 01						

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

HELIOCENTRIC — EQUATORIAL COORDINATES

X	.11905356 C9	Y	-.65479127 C8	Z	-.37038300 C8	DX	.17660618 02	DY	.19965793 02	DZ	.88786368 01
R	.15116966 C9	LAT	-.14182510 C2	LON	.32432207 C3	V	.28095561 02	PTH	.90457573 00	AZ	.70732355 02
XE	.11925512 C9	YE	-.85740805 08	ZE	-.37184252 08	DXE	.17399744 02	DYE	.21420315 02	DZE	.92892053 01
XT	.11905560 C9	YT	-.65476924 C8	ZT	-.37036898 C8	DXT	.17019773 02	DYT	.20825324 02	DZT	.90576997 01
LTE	-.14206707 C2	LOE	.32428501 03	LTT	-.14181960 02	LOT	.32432324 03	RST	.15116968 09	VST	.28379724 02
EPS	.16150635 03	ESP	.44784179-01	SEP	.18450336 C2	EPM	.10792311 03	EMP	.71577301 02	MEP	.49953016 00
MPS	.90284004 C2	MSP	.98911702-02	SMP	.89614736 C2	SEM	.18944670 02	EMS	.16101077 03	ESM	.44784179-01
RPM	.33188070 C4	SPN	.16049434 C3								
GCE	.83624167 C2	GCT	.27163598 C3	SIP	.58802611 02	CPT	.88470045 02	SIN	.56888652 02		
REP	.36111819 C6	VEP	.15301571 C1	CPE	.98622725 C2	CPS	.78783019 02				

SELENOCENTRIC — EQUATORIAL COORDINATES

X	-.20469650 C4	Y	-.22038729 C4	Z	-.14026254 C4	DX	.64084491 00	DY	-.85953085 00	DZ	-.17906280 00
R	.33188070 C4	DEC	-.25000706 02	RA	.22711355 C3	V	.10869862 01	PTH	.13361434 02	AZ	.94362068 02
R	.33188063 C4	LAT	-.71022509 C1	LON	.28277251 C3	VP	.10786096 01	PTP	.13467144 02	AZP	.79960714 02
LTS	.14926840 01	LNS	.19434691 C3	LTE	-.62161346 C1	LNE	.35590716 03				
ALT	.15807170 C4	SHA	-.33187319 C4	ALP	.37009371-01	DR	.25119499 00	DP	.18257738-01	ASD	.31581393 02
HGE	.19849365 C3	SVL	.80116265 C1	HNG	.90387788 02	SIA	.76341713 02				

SELENOCENTRIC CONIC

EPOCH OF PERICENTER PASSAGE 23576412406C202476432311 J.D.= 2439352.64151029 AUG. 15,1966 03 23 46.489

SMA	.27653132 04	ECC	.30220344 00	B	.26360165 C4	SLR	.25127657 04	APO	.36010003 04	PCA	.19296260 04
VH	.97468698 00	C3	-.17728842 01	C1	.35098483 04	TFP	.42955246 04	TF	.45271383 00	PER	.21748672 03
TA	.14348167 C3	MTA	.18000000 C3	EA	.13147718 C3	MA	.11850446 03			TFI	.50243055 00
								C3J	-.50551145 01		

ALL VECTORS REFERENCED TO EARTH EQUATOR PLANE

X	-.20469650 04	Y	-.22038729 C4	Z	-.14026254 04	DX	.64084491 00	DY	-.85953085 00	DZ	-.17906280 00
INC	.25354274 C2	LAN	.32734505 C3	APE	.11725474 C3	MX	.75246213 00	MY	-.65501837 00	MZ	-.68937424-01
WX	-.23105505 00	WY	-.36052658 C0	WZ	.90367731 C0	PX	.47908332-01	PY	.92346761 00	PZ	.38067342 00
CX	-.97176038 00	QY	.13125016 C0	QZ	-.19609954 00	RX	.19722333-01	RY	.38016218 00	RZ	-.92470948 00
BX	.97176045 C0	RY	-.13125017 00	BZ	.19609955 C0	TX	.99865701 00	TY	-.51809063-01	TZ	.00000000 00
DAP	.22375402 C2	RAP	.87030226 C2								

BTQ	.25760612 04	BRQ	-.55900968 C3	B	.26360165 C4	THA	.34775654 03	T VECTOR IN EARTH EQUATOR PLANE

ALL VECTORS REFERENCED TO TRUE TARGET EQU. PLANE AND NODE

X	-.32932055 C4	Y	-.29918969 C2	Z	-.41033867 C3	DX	-.26240189 00	DY	-.10440616 01	DZ	.15035586 00
INC	.12209364 C2	LAN	.21567800 03	APE	.18074130 C3	MX	-.12429176-01	MY	-.98509225 00	MZ	.17157721 00
WX	-.12334400 C0	WY	.17179044 00	WZ	.97738134 C0	PX	.80486430 00	PY	.59345248 00	PZ	-.27361614-02
QX	-.58049943 00	QY	.78632186 00	QZ	-.21146680 C0	RX	-.22022470-02	RY	-.16237880-02	RZ	-.99999619 00
BX	.58049948 00	RY	-.78632192 00	BZ	.21146682 00	TX	.59345474 00	TY	-.80486736 00	TZ	.00000000 00
DAP	-.15677162 00	RAP	.36402553 C2								

BTT	.25764009 C4	BRT	-.55743160 C3	B	.26360144 C4	THA	.34779163 03	T VECTOR IN TRUE TARGET EQU. PLANE

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

J MATRIX — ITERATION NUMBER 7

	X	Y	Z	DX	DY	DZ
X	.24502017 07	-.92791378 07	-.29529851 07	.12945725 11	-.50975130 10	.10274111 10
Y	-.92791378 07	.29389932 10	.11649168 10	-.42660162 13	.57978815 12	-.84979256 12
Z	-.29529851 07	.11649168 10	.46208436 09	-.16910274 13	.22877083 12	-.33726111 12
DX	.12945725 11	-.42660162 13	-.16910274 13	.61939043 16	-.84099279 15	.12342421 16
DY	-.50975130 10	.57978815 12	.22877083 12	-.84099279 15	.11890507 15	-.16540577 15
DZ	.10274111 10	-.84979256 12	-.33726111 12	.12342421 16	-.16540577 15	.24700286 15

CORRELATIONS BASED ON J MATRIX — ITERATION NUMBER 7

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.10934714 00	.87760624-01	-.10508560 00	.29864638 00	-.41763064-01
Y	.10934714 00	-.10000000 01	-.99962012 00	.99986409 00	-.98077609 00	.99738459 00
Z	.87760624-01	-.99962012 00	-.10000000 01	.99955750 00	-.97597756 00	.99828526 00
DX	-.10508560 00	.99986409 00	.99955750 00	-.10000000 01	.97996337 00	-.99785427 00
DY	.29864638 00	-.98077609 00	-.97597756 00	.97996337 00	-.10000000 01	.96516038 00
DZ	-.41763064-01	.99738459 00	.99828526 00	-.99785427 00	.96516038 00	-.10000000 01

ITERATION NUMBER 7 EPOCH 66/08/14 163152.013 CLOCK L25140 SCS .69995 03 QSOS .69995 03

X 20570267356315255456C756 Y 21367655210416051600623 3 Z 21255101047615775722011 3
DX 6C17C52570225463460515 12 DY 17662434055714372336012 2 DZ 57757751136434451162011 5
000000 23443525422200000000000

Standard Orbit

C	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.12481624-03	.51487286-02	.10000000 02	.28179291 02	.28179165 02	.28102268 02	.76897620-01
Y	.55405179-04	.12393854-01	.10000000 02	.17868291 04	.17868292 04	.17868838 04	-.54626464-01
Z	-.45123826-04	.30608639-01	.10000000 02	.72203372 03	.72203367 03	.72176532 03	.26835532 00
DX	.12349540-07	.12541835-04	.99999998-02	-.17708667 01	-.17708667 01	-.17710436 01	.17693639-03
DY	-.11155033-06	.29138655-04	.99999998-02	.19760211 00	.19760200 00	.19722083 00	.38117356-03
DZ	-.36536897-07	.43736090-04	.99999998-02	-.37465183 00	-.37465186 00	-.37411746 00	-.53440779-03

TABLE VIII. - CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

J INVERSE ITERATION NUMBER 7

	X	Y	Z	DX	DY	DZ
X	.26509406-04	-.35997663-04	.86869876-04	.35298280-07	.93368924-07	-.11920030-06
Y	-.35997663-04	.15360763-03	-.37757347-03	-.15253388-06	-.35757232-06	.53582364-06
Z	.86869876-04	-.37757347-03	.93688879-03	.38125536-06	.88613686-06	-.13318124-05
DX	.35298280-07	-.15253388-06	.38125536-06	.15729773-09	.36293084-09	-.54731530-09
DY	.93368924-07	-.35757232-06	.88613686-06	.36293084-09	.84906357-09	-.12655855-08
DZ	-.11920030-06	.53582364-06	-.13318124-05	-.54731530-09	-.12655855-08	.19128456-08

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 7

	X	Y	Z	DX	DY	DZ
X	.26509406-04	-.35997663-04	.86869876-04	.35298280-07	.93368924-07	-.11920030-06
Y	-.35997663-04	.15360763-03	-.37757347-03	-.15253388-06	-.35757232-06	.53582364-06
Z	.86869876-04	-.37757347-03	.93688879-03	.38125536-06	.88613686-06	-.13318124-05
DX	.35298280-07	-.15253388-06	.38125536-06	.15729773-09	.36293084-09	-.54731530-09
DY	.93368924-07	-.35757232-06	.88613686-06	.36293084-09	.84906357-09	-.12655855-08
DZ	-.11920030-06	.53582364-06	-.13318124-05	-.54731530-09	-.12655855-08	.19128456-08

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 7

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.56411534 00	.55122027 00	.54662854 00	.62234649 00	-.52934325 00
Y	-.56411534 00	.10000000 01	-.99529322 00	-.98129298 00	-.99011897 00	.98849736 00
Z	.55122027 00	-.99529322 00	.10000000 01	.99314051 00	.99354301 00	-.99485338 00
DX	.54662854 00	-.98129298 00	.99314051 00	.10000000 01	.99309898 00	-.99778369 00
DY	.62234649 00	-.99011897 00	.99354301 00	.99309898 00	.10000000 01	-.99307354 00
DZ	-.52934325 00	.98849736 00	-.99485338 00	-.99778369 00	-.99307354 00	.10000000 01

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 41 66/08/15 ITERATION NUMBER 7 PASS NUMBER 05/226

FREQUENCY2C4564C.C

TIME H M S	TC	C	CC3				
002332	60	41	-.17756637	05	.102	00	-.0293
002432	60	41	-.17999695	05	.102	00	-.0044
002532	60	41	-.18220542	05	.102	00	-.0408
002632	60	41	-.18420090	05	.102	00	-.0266
002732	60	41	-.18599224	05	.102	00	-.0427
002832	60	41	-.18758801	05	.102	00	-.0320
002932	60	41	-.18899649	05	.102	00	-.0176
003032	60	41	-.19022566	05	.102	00	-.0168
003132	60	41	-.19128322	05	.102	00	-.0110
003232	60	41	-.19217652	05	.102	00	.0017
003332	60	41	-.19291262	05	.102	00	.0117
003432	60	41	-.19349828	05	.102	00	.0281
003532	60	41	-.19393997	05	.102	00	.0308
003632	60	41	-.19424389	05	.102	00	.0554
003732	60	41	-.19441589	05	.102	00	.0557
003832	60	41	-.19446161	05	.102	00	.0613
003932	60	41	-.19438640	05	.102	00	.0735
004032	60	41	-.19419534	05	.102	00	.0837
004132	60	41	-.19389328	05	.102	00	.0942
004232	60	41	-.19348482	05	.102	00	.0984
004332	60	41	-.19297435	05	.102	00	.1016
004432	60	41	-.19236601	05	.102	00	.1006
004532	60	41	-.19166375	05	.102	00	.1250
004632	60	41	-.19087132	05	.102	00	.1157
004732	60	41	-.18999229	05	.102	00	.1123
004832	60	41	-.18903002	05	.102	00	.1357
004932	60	41	-.18798772	05	.102	00	.1223
005032	60	41	-.18686641	05	.102	00	.1416
005132	60	41	-.18567498	05	.102	00	.1313
005232	60	41	-.18441013	05	.102	00	.1299
005332	60	41	-.18307647	05	.102	00	.1309
005432	60	41	-.18167644	05	.102	00	.1445
005532	60	41	-.18021235	05	.102	00	.1353
005632	60	41	-.17868641	05	.102	00	.1411
005732	60	41	-.17710067	05	.102	00	.1343
005832	60	41	-.17545713	05	.102	00	.1465
005932	60	41	-.17375762	05	.102	00	.1294
010032	60	41	-.17200354	05	.102	00	.1274
010132	60	41	-.17019772	05	.102	00	.1387
010232	60	41	-.16834055	05	.102	00	.1218
010332	60	41	-.16643391	05	.102	00	.1245
010432	60	41	-.16447523	05	.102	00	.1401
010532	60	41	-.16247781	05	.102	00	.1145
010632	60	41	-.16043093	05	.102	00	.1099
010732	60	41	-.15833976	05	.102	00	.1260
010832	60	41	-.15620542	05	.102	00	.1091
010932	60	41	-.15402897	05	.102	00	.0972
011032	60	41	-.15181140	05	.102	00	.0901
011132	60	41	-.14955364	05	.102	00	.0974
011232	60	41	-.14725658	05	.102	00	.0911
011332	60	41	-.14492103	05	.102	00	.0864
011432	60	41	-.14254778	05	.102	00	.0781
011532	60	41	-.14013756	05	.102	00	.0729
011632	60	41	-.13769104	05	.102	00	.0546
011732	60	41	-.13520889	05	.102	00	.0557
011832	60	41	-.13269168	05	.102	00	.0684
011932	60	41	-.13013997	05	.102	00	.0474
012032	60	41	-.12755430	05	.102	00	.0302
012132	60	41	-.12493514	05	.102	00	.0304
012232	60	41	-.12228294	05	.102	00	.0269
012332	60	41	-.11959812	05	.102	00	.0117
012432	60	41	-.11688106	05	.102	00	.0057
012532	60	41	-.11413212	05	.102	00	-.0050
012632	60	41	-.11135162	05	.102	00	-.0050
012732	60	41	-.10853986	05	.102	00	-.0137
012832	60	41	-.10569711	05	.102	00	-.0386
012932	60	41	-.10282363	05	.102	00	-.0200
013032	60	41	-.99919631	04	.102	00	-.0536
013132	60	41	-.96985298	04	.102	00	-.0536
013232	60	41	-.94020823	04	.102	00	-.0510
013332	60	41	-.91026353	04	.102	00	-.0647
013432	60	41	-.88002022	04	.102	00	-.0811
013532	60	41	-.84947939	04	.102	00	-.0894
013632	60	41	-.81864217	04	.102	00	-.0784
013732	60	41	-.78750917	04	.102	00	-.1084
013832	60	41	-.75608099	04	.102	00	-.1069
013932	60	41	-.72435814	04	.102	00	-.1187
014032	60	41	-.69234082	04	.102	00	-.1250
014132	60	41	-.66002931	04	.102	00	-.1235
014232	60	41	-.62742349	04	.102	00	-.1434
014332	60	41	-.59452333	04	.102	00	-.1333
014432	60	41	-.56132850	04	.102	00	-.1650
014532	60	41	-.52783868	04	.102	00	-.1465
014632	60	41	-.49405336	04	.102	00	-.1665
014732	60	41	-.45997197	04	.102	00	-.1636
014832	60	41	-.42559396	04	.102	00	-.1772

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 41 66/08/15 ITERATION NUMBER 7 PASS NUMBER 05/226

FREQUENCY204564C.0

TIME HMS	TC	Q	CC3			
014932	60	41	-.29051642	C4	.102	00	-.1660
015032	60	41	-.35594468	C4	.102	00	-.1865
015132	60	41	-.32067182	C4	.102	00	-.1816
015232	60	41	-.28509882	C4	.102	00	-.1948
015332	60	41	-.24922487	C4	.102	00	-.1846
015432	60	41	-.21304881	C4	.102	00	-.1953
015532	60	41	-.17656974	C4	.102	00	-.2026
015632	60	41	-.13978658	C4	.102	00	-.2007
015732	60	41	-.10269836	04	.102	00	-.1997
015832	60	41	-.66303970	C3	.102	00	-.2104
015932	60	41	-.27602470	C3	.102	00	-.2251
020032	60	41	.10406988	C3	.102	00	-.2031
020132	60	41	.48725366	03	.102	00	-.2036
020232	60	41	.87353410	C3	.102	00	-.2173
020332	60	41	.12629181	C4	.102	00	-.2017
020432	60	41	.16554107	C4	.102	00	-.2109
020532	60	41	.20510165	C4	.102	00	-.2163
020632	60	41	.24497380	C4	.102	00	-.2046
020732	60	41	.28515756	C4	.102	00	-.1924
020832	60	41	.32565271	C4	.102	00	-.2104
020932	60	41	.36645883	C4	.102	00	-.1885
021032	60	41	.40757524	C4	.102	00	-.1689
021132	60	41	.44900081	C4	.102	00	-.1748
021232	60	41	.49073418	C4	.102	00	-.1753
021332	60	41	.53277350	C4	.102	00	-.1685
021432	60	41	.57511648	04	.102	00	-.1479
021532	60	41	.61776036	C4	.102	00	-.1372
021632	60	41	.66070174	04	.102	00	-.1343
021732	60	41	.70393668	C4	.102	00	-.1169
021832	60	41	.74746054	C4	.102	00	-.1055
021932	60	41	.79126786	C4	.102	00	-.0955
022032	60	41	.83535241	C4	.102	00	-.0742
022132	60	41	.87970694	C4	.102	00	-.0696
022232	60	41	.92432341	C4	.102	00	-.0508
022332	60	41	.96919242	C4	.102	00	-.0242
022432	60	41	.10143034	C5	.102	00	-.0177
022532	60	41	.10596447	C5	.102	00	.0198
022632	60	41	.11052028	C5	.102	00	.0051
022732	60	41	.11509629	C5	.102	00	.0544
022832	60	41	.11969083	C5	.102	00	.0498
022932	60	41	.12430205	C5	.102	00	.0786
023032	60	41	.12892787	C5	.102	00	.0967
023132	60	41	.13356599	C5	.102	00	.1174

TIME HMS	TC	Q	CC3			
023232	60	41	.13821390	C5	.102	00	.1270
023332	60	41	.14286875	C5	.102	00	.1582
023432	60	41	.14752746	C5	.102	00	.1543
023532	60	41	.15218659	C5	.102	00	.1748
023632	60	41	.15684237	C5	.102	00	.1802
023732	60	41	.16149065	C5	.102	00	.1851
023832	60	41	.16612687	C5	.102	00	.1797
023932	60	41	.17074603	C5	.102	00	.1963
024032	60	41	.17534265	C5	.102	00	.1851
024132	60	41	.17991075	C5	.102	00	.1919
024232	60	41	.18444376	C5	.102	00	.1738
024332	60	41	.18893456	C5	.102	00	.1436
024432	60	41	.19337535	C5	.102	00	.1479
024532	60	41	.19775767	C5	.102	00	.1162
024632	60	41	.20207232	C5	.102	00	.1013
024732	60	41	.20630932	C5	.102	00	.0845
024832	60	41	.21045789	C5	.102	00	.0447
024932	60	41	.21450634	C5	.102	00	.0330
025032	60	41	.21844209	C5	.102	00	.0076
025132	60	41	.22225161	C5	.102	00	-.0117
025232	60	41	.22592038	C5	.102	00	-.0378
025332	60	41	.22943281	C5	.102	00	-.0315
025432	60	41	.23277234	C5	.102	00	-.0508
025532	60	41	.23592126	C5	.102	00	-.0764
025632	60	41	.23886086	C5	.102	00	-.1023
025732	60	41	.24157134	C5	.102	00	-.1011
025932	60	41	.24622077	C5	.102	00	-.1279
030032	60	41	.24811528	C5	.102	00	-.1108
030132	60	41	.24969201	C5	.102	00	-.1177
030232	60	41	.25092690	C5	.102	00	-.0896
030332	60	41	.25175540	C5	.102	00	-.0740
030432	60	41	.25227278	05	.102	00	-.0623
030532	60	41	.25233428	C5	.102	00	-.0452
030632	60	41	.25195550	C5	.102	00	-.0164
030732	60	41	.25111269	05	.102	00	-.0022
030832	60	41	.24978318	C5	.102	00	-.0015
030932	60	41	.24794578	C5	.102	00	.0225
031032	60	41	.24558123	C5	.102	00	.0266
031132	60	41	.24267275	C5	.102	00	.0249
031232	60	41	.23920645	C5	.102	00	-.0115
031332	60	41	.23517187	C5	.102	00	-.0359
031432	60	41	.23056248	C5	.102	00	-.1145

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 41 66/08/15 ITERATION NUMBER 7 PASS NUMBER 05/226

FREQUENCY2045660.0

TIME H M S	TC	Q	CC3			
040132	60	41	-.12784322	05	.103 00	-.1111
040232	60	41	-.13033514	05	.103 00	-.0854
040332	60	41	-.13260965	05	.103 00	-.1016
040432	60	41	-.13467559	05	.103 00	-.0745
040532	60	41	-.13654155	05	.103 00	-.0786
040632	60	41	-.13821583	05	.103 00	-.0567
040732	60	41	-.13970649	05	.103 00	-.0511
040832	60	41	-.14102127	05	.103 00	-.0398
040932	60	41	-.14216759	05	.103 00	-.0072
041032	60	41	-.14315264	05	.103 00	.0145
041132	60	41	-.14398329	05	.103 00	.0128
041232	60	41	-.14466609	05	.103 00	.0427
041332	60	41	-.14520734	05	.103 00	.0676
041432	60	41	-.14561304	05	.103 00	.0713
041532	60	41	-.14588892	05	.103 00	.0925
041632	60	41	-.14604046	05	.103 00	.0957
041732	60	41	-.14607285	05	.103 00	.1183
041832	60	41	-.14599107	05	.103 00	.1406
041932	60	41	-.14579583	05	.103 00	.1333
042032	60	41	-.14550364	05	.103 00	.1470
042132	60	41	-.14510674	05	.103 00	.1743
042232	60	41	-.14461323	05	.103 00	.1558
042332	60	41	-.14402693	05	.103 00	.1768
042432	60	41	-.14335152	05	.103 00	.2026
042532	60	41	-.14259048	05	.103 00	.1812
042632	60	41	-.14174709	05	.103 00	.2095
042732	60	41	-.14082452	05	.103 00	.2021
042832	60	41	-.13982570	05	.103 00	.2036
042932	60	41	-.13875346	05	.103 00	.2230
043032	60	41	-.13761048	05	.104 00	.2148
043132	60	41	-.13635928	05	.104 00	.2285

DATA STATISTICS STATION 41 ITERATION 7

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
05/226	CC3	8/15-002332	8/15-043132	202	.122 00	.122 00	.432-02	.150-01

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 12 66/CE/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3				
171032	60	12	-.18991697	05	.100	00	-.2451
171132	60	12	-.19152500	05	.100	00	-.2578
171232	60	12	-.19293142	05	.100	00	-.2500
171332	60	12	-.19414513	05	.100	00	-.2529
171432	60	12	-.19517471	05	.100	00	-.2451
171532	60	12	-.19602839	05	.100	00	-.2441
171632	60	12	-.19671408	05	.100	00	-.2417
171732	60	12	-.19723932	05	.100	00	-.2266
171832	60	12	-.19761133	05	.100	00	-.2168
171932	60	12	-.19783703	05	.100	00	-.2139
172032	60	12	-.19792298	05	.100	00	-.2021
172132	60	12	-.19787544	05	.100	00	-.1895
172232	60	12	-.19770039	05	.100	00	-.1860
172332	60	12	-.19740349	05	.100	00	-.1680
172432	60	12	-.19699014	05	.100	00	-.1699
172532	60	12	-.19646545	05	.100	00	-.1553
172632	60	12	-.19583429	05	.100	00	-.1455
172732	60	12	-.19510128	05	.100	00	-.1387
172832	60	12	-.19427078	05	.100	00	-.1299
172932	60	12	-.19334695	05	.100	00	-.1294
173032	60	12	-.19233372	05	.100	00	-.1103
173132	60	12	-.19123483	05	.100	00	-.1084
173232	60	12	-.19005379	05	.100	00	-.0959
173332	60	12	-.18879395	05	.100	00	-.0879
173432	60	12	-.18745847	05	.100	00	-.0859
173532	60	12	-.18605038	05	.100	00	-.0791
173632	60	12	-.18457247	05	.100	00	-.0693
173732	60	12	-.18302746	05	.100	00	-.0623
173832	60	12	-.18141787	05	.100	00	-.0630
173932	60	12	-.17974612	05	.100	00	-.0549
174032	60	12	-.17801447	05	.100	00	-.0447
174132	60	12	-.17622507	05	.100	00	-.0430
174232	60	12	-.17437995	05	.100	00	-.0381
174332	60	12	-.17248104	05	.100	00	-.0291
174432	60	12	-.17053016	05	.100	00	-.0342
174532	60	12	-.16852900	05	.100	00	-.0247
174632	60	12	-.16647920	05	.100	00	-.0212
174732	60	12	-.16438230	05	.100	00	-.0203
174832	60	12	-.16223972	05	.100	00	-.0199
174932	60	12	-.16005283	05	.100	00	-.0082
175032	60	12	-.15782293	05	.100	00	-.0156
175132	60	12	-.15555122	05	.100	00	-.0107
175232	60	12	-.15323886	05	.100	00	-.0140

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER IZ 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q				
175332	60	12	-.15088691	05	.100 00	-.0088
175432	60	12	-.14849639	05	.100 00	-.0106
175532	60	12	-.14606826	05	.100 00	-.0070
175632	60	12	-.14360342	05	.100 00	-.0160
175732	60	12	-.14110271	05	.100 00	-.0118
175832	60	12	-.13856693	05	.100 00	-.0149
175932	60	12	-.13599683	05	.100 00	-.0172
180032	60	12	-.13339308	05	.100 00	-.0164
180132	60	12	-.13075637	05	.100 00	-.0126
180232	60	12	-.12808731	05	.100 00	-.0275
180332	60	12	-.12538645	05	.100 00	-.0217
180432	60	12	-.12265434	05	.100 00	-.0328
180532	60	12	-.11989147	05	.100 00	-.0283
180632	60	12	-.11709831	05	.100 00	-.0273
180732	60	12	-.11427529	05	.100 00	-.0381
180832	60	12	-.11142280	05	.100 00	-.0449
180932	60	12	-.10854122	05	.100 00	-.0363
181032	60	12	-.10563088	05	.100 00	-.0535
181132	60	12	-.10269210	05	.100 00	-.0480
181232	60	12	-.99725169	04	.100 00	-.0580
181332	60	12	-.96730344	04	.100 00	-.0573
181432	60	12	-.93707863	04	.100 00	-.0637
181532	60	12	-.90657941	04	.100 00	-.0728
181632	60	12	-.87580773	04	.100 00	-.0645
181832	60	12	-.81345376	04	.100 00	-.0791
181932	60	12	-.78187425	04	.100 00	-.0825
182032	60	12	-.75002819	04	.100 00	-.0847
182132	60	12	-.71791637	04	.100 00	-.0947
182232	60	12	-.68553971	04	.100 00	-.0945
182332	60	12	-.65289903	04	.100 00	-.1013
182432	60	12	-.61999470	04	.100 00	-.1030
182532	60	12	-.58682725	04	.100 00	-.1108
182632	60	12	-.55339697	04	.100 00	-.1052
182732	60	12	-.51970401	04	.100 00	-.1182
182832	60	12	-.48574848	04	.100 00	-.1235
182932	60	12	-.45153029	04	.100 00	-.1221
183032	60	12	-.41704939	04	.100 00	-.1228
183132	60	12	-.38230556	04	.100 00	-.1279
183232	60	12	-.34729852	04	.100 00	-.1230
183332	60	12	-.31202797	04	.100 00	-.1372
184232	60	12	.55271006	03	.100 00	-.1353
184432	60	12	.93470465	03	.100 00	-.1382
184532	60	12	.13153854	04	.100 00	-.1353

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3			
184632	60	12	.17067534	04	.100	00	-.1284
184732	60	12	.20968083	04	.100	00	-.1250
184832	60	12	.24895497	04	.100	00	-.1165
184932	60	12	.28845734	04	.100	00	-.1233
185032	60	12	.32830743	04	.100	00	-.1160
185132	60	12	.36838459	04	.100	00	-.1042
185232	60	12	.40872776	04	.100	00	-.1025
185332	60	12	.44933569	04	.100	00	-.0986
185432	60	12	.49020680	04	.100	00	-.0847
185532	60	12	.53133925	04	.100	00	-.0759
185632	60	12	.57273068	04	.100	00	-.0735
185732	60	12	.61437842	04	.100	00	-.0593
190332	60	12	.86942732	04	.100	00	-.0065
190432	60	12	.91274600	04	.100	00	.0232
190532	60	12	.95627730	04	.100	00	.0270
190632	60	12	.10000121	05	.100	00	.0369
190732	60	12	.10439402	05	.100	00	.0563
190832	60	12	.10880500	05	.100	00	.0664
190932	60	12	.11322288	05	.100	00	.0789
191032	60	12	.11767622	05	.100	00	.0947
191132	60	12	.12213346	05	.100	00	.1040
191232	60	12	.12660284	05	.100	00	.1160
191332	60	12	.13108241	05	.100	00	.1255
191432	60	12	.13557005	05	.100	00	.1367
191532	60	12	.14006338	05	.100	00	.1460
191632	60	12	.14455980	05	.100	00	.1533
191732	60	12	.14905646	05	.100	00	.1543
191832	60	12	.15355020	05	.100	00	.1636
191932	60	12	.15803757	05	.100	00	.1592
192032	60	12	.16251479	05	.100	00	.1543
192132	60	12	.16697771	05	.100	00	.1538
192232	60	12	.17142180	05	.100	00	.1450
192332	60	12	.17584209	05	.100	00	.1328
192432	60	12	.18023318	05	.100	00	.1147
192532	60	12	.18458916	05	.100	00	.0920
192632	60	12	.18890362	05	.100	00	.0710
192732	60	12	.19316956	05	.100	00	.0435
192832	60	12	.19737939	05	.100	00	.0193
192932	60	12	.20152484	05	.100	00	-.0173
193032	60	12	.20559700	05	.100	00	-.0417
193132	60	12	.20958620	05	.100	00	-.0786
193232	60	12	.21348201	05	.100	00	-.1091
193332	60	12	.21727313	05	.100	00	-.1465

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3				
193432	60	12	.22054746	05	.100	00	-.1631
193532	60	12	.22449196	05	.100	00	-.2046
193632	60	12	.22789267	05	.100	00	-.2168
193732	60	12	.23113463	05	.100	00	-.2471
193832	60	12	.23420193	05	.100	00	-.2773
193932	60	12	.23707761	05	.100	00	-.2695
FREQUENCY2045630.0							
195232	60	12	.24767635	05	.100	00	-.0930
195332	60	12	.24563624	05	.100	00	-.0571
195432	60	12	.24307781	05	.100	00	-.0225
195532	60	12	.23958389	05	.100	00	-.0061
195632	60	12	.23634005	05	.100	00	-.0129
195815	10	12	.22879493	05	.246	00	-.0933
195825	10	12	.22757073	05	.246	00	-.0728
195835	10	12	.22713061	05	.246	00	-.1116
195845	10	12	.22627459	05	.246	00	-.1094
FREQUENCY2045530.0							
204132	60	12	-.12446754	05	.101	00	-.0465
204232	60	12	-.12780532	05	.101	00	-.0845
204332	60	12	-.13088521	05	.101	00	-.1128
204432	60	12	-.13370553	05	.101	00	-.1382
204532	60	12	-.13628055	05	.101	00	-.1616
204632	60	12	-.13862027	05	.101	00	-.1733
204732	60	12	-.14073450	05	.101	00	-.1748
204832	60	12	-.14263280	05	.101	00	-.1787
204932	60	12	-.14432442	05	.101	00	-.1836
205032	60	12	-.14581832	05	.101	00	-.1680
205132	60	12	-.14712317	05	.101	00	-.1665
205232	60	12	-.14824726	05	.101	00	-.1567
205332	60	12	-.14919863	05	.101	00	-.1455
205432	60	12	-.14998492	05	.101	00	-.1243
205532	60	12	-.15061349	05	.101	00	-.1179
205632	60	12	-.15109133	05	.101	00	-.1094
205732	60	12	-.15142519	05	.101	00	-.0889
205832	60	12	-.15162147	05	.101	00	-.0784
205932	60	12	-.15168623	05	.101	00	-.0601
210032	60	12	-.15162531	05	.101	00	-.0527
210132	60	12	-.15144423	05	.101	00	-.0435
210232	60	12	-.15114824	05	.101	00	-.0254

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2C4553C.C

TIME H M S	TC	Q	CC3				
210332	60	12	-.15074234	05	.101	00	-.0237
210432	60	12	-.15023129	05	.101	00	-.0040
210532	60	12	-.14961957	05	.101	00	-.0011
210632	60	12	-.14891146	05	.101	00	.0133
210732	60	12	-.14811102	05	.101	00	.0189
210832	60	12	-.14722211	05	.101	00	.0276
210932	60	12	-.14624635	05	.101	00	.0348
211032	60	12	-.14519321	05	.101	00	.0376
211132	60	12	-.14405996	05	.101	00	.0544
211232	60	12	-.14285171	05	.101	00	.0542
211332	60	12	-.14157138	05	.101	00	.0632
211432	60	12	-.14022176	05	.101	00	.0684
211532	60	12	-.13880551	05	.101	00	.0759
211632	60	12	-.13732508	05	.101	00	.0829
211732	60	12	-.13578285	05	.101	00	.0847
211832	60	12	-.13418106	05	.101	00	.0891
211932	60	12	-.13252181	05	.101	00	.0894
212032	60	12	-.13080710	05	.101	00	.0938
212132	60	12	-.12903882	05	.101	00	.0989
212232	60	12	-.12721875	05	.101	00	.1006
212332	60	12	-.12534860	05	.101	00	.1015
212432	60	12	-.12342993	05	.101	00	.1016
212532	60	12	-.12146428	05	.101	00	.1111
212632	60	12	-.11945304	05	.101	00	.1045
212732	60	12	-.11739758	05	.101	00	.1082
212832	60	12	-.11529916	05	.101	00	.1079
212932	60	12	-.11315896	05	.101	00	.1047
213032	60	12	-.11097813	05	.101	00	.1130
213132	60	12	-.10875771	05	.101	00	.0964
213232	60	12	-.10649872	05	.101	00	.1060
213332	60	12	-.10420209	05	.101	00	.1013
213432	60	12	-.10186872	05	.101	00	.0967
213532	60	12	-.95499409	04	.101	00	.0911
213632	60	12	-.97054968	04	.101	00	.0969
213732	60	12	-.94656114	04	.101	00	.0864
213832	60	12	-.92183541	04	.101	00	.0874
213932	60	12	-.89677896	04	.101	00	.0813
214032	60	12	-.87139769	04	.101	00	.0769
214132	60	12	-.84569732	04	.101	00	.0732
214232	60	12	-.81968297	04	.101	00	.0715
214332	60	12	-.79335959	04	.101	00	.0710
214432	60	12	-.76673168	04	.101	00	.0585
214532	60	12	-.73980235	04	.101	00	.0586

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3				
214632	60	12	-.71257862	04	.101	00	.0447
214732	60	12	-.68506095	04	.101	00	.0428
214832	60	12	-.65725361	04	.101	00	.0446
214932	60	12	-.62515573	04	.101	00	.0306
215032	60	12	-.60078189	04	.101	00	.0272
215132	60	12	-.57212269	04	.101	00	.0270
215232	60	12	-.54318439	04	.101	00	.0107
215332	60	12	-.51396894	04	.101	00	.0144
215432	60	12	-.48447814	04	.101	00	-.0019
215532	60	12	-.45471366	04	.101	00	.0033
215632	60	12	-.42467679	04	.101	00	-.0071
215732	60	12	-.39436880	04	.101	00	-.0119
215832	60	12	-.36379069	04	.101	00	-.0181
215932	60	12	-.33294326	04	.101	00	-.0258
220032	60	12	-.30182723	04	.101	00	-.0360
220132	60	12	-.27044315	04	.101	00	-.0352
220332	60	12	-.20687203	04	.101	00	-.0454
220432	60	12	-.17468540	04	.101	00	-.0543
220532	60	12	-.14223141	04	.101	00	-.0526
220632	60	12	-.10950988	04	.101	00	-.0596
220732	60	12	-.76520607	03	.101	00	-.0688
220832	60	12	-.43263260	03	.101	00	-.0757
220932	60	12	-.97373534	02	.101	00	-.0681
221232	60	12	.92456856	03	.101	00	-.0852
221332	60	12	.12706258	04	.101	00	-.0925
221432	60	12	.16194002	04	.101	00	-.0918
221532	60	12	.19708588	04	.101	00	-.0903
221632	60	12	.23251302	04	.101	00	-.0969
221732	60	12	.26821025	04	.101	00	-.0942
221832	60	12	.30418235	04	.101	00	-.0986
221932	60	12	.34043007	04	.101	00	-.1008
222032	60	12	.37695425	04	.101	00	-.1091
222132	60	12	.41375556	04	.101	00	-.0974
222232	60	12	.45083462	04	.101	00	-.1047
222332	60	12	.48819213	04	.101	00	-.0964
222432	60	12	.52582848	04	.101	00	-.1016
222532	60	12	.56374407	04	.101	00	-.0903
222632	60	12	.60193914	04	.101	00	-.0916
222732	60	12	.64041381	04	.101	00	-.0881
222832	60	12	.67916790	04	.101	00	-.0874
222932	60	12	.71820115	04	.101	00	-.0867
223032	60	12	.75751306	04	.101	00	-.0723
223132	60	12	.79710275	04	.101	00	-.0693

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	
223232	60	12	.83696916 C4 .101 00	-.0583
223332	60	12	.87711076 C4 .101 CC	-.0576
223432	60	12	.91752579 C4 .101 CC	-.0413
223532	60	12	.95821201 C4 .101 00	-.0367
223632	60	12	.99916667 04 .101 00	-.0334
223732	60	12	.10403866 C5 .101 CC	-.0159
223832	60	12	.10818679 C5 .101 00	-.0045
223932	60	12	.11236063 C5 .101 C0	-.0050
224032	60	12	.11655965 C5 .101 CC	.0182
224132	60	12	.12078328 C5 .102 CC	.0306
224232	60	12	.12503083 C5 .102 00	.0422
224332	60	12	.12930153 C5 .102 00	.0548
224432	60	12	.13359455 C5 .102 C0	.0703
224532	60	12	.13790888 05 .102 00	.0874
224632	60	12	.14224342 C5 .102 CC	.1077
224732	60	12	.14659696 C5 .102 00	.1125
224832	60	12	.15096811 05 .102 CC	.1309
224932	60	12	.15535533 C5 .102 00	.1504
225032	60	12	.15975692 C5 .102 00	.1665
225132	60	12	.16417099 C5 .102 CC	.1763
225232	60	12	.16859542 05 .102 C0	.1914

FREQUENCY2045750.0

230432	60	12	.22135850 C5 .102 CC	.1934
230532	60	12	.22559226 05 .102 C0	.1733
230632	60	12	.22977156 C5 .102 00	.1440
230732	60	12	.23388642 C5 .102 C0	.1243
230832	60	12	.23793377 C5 .102 00	.0981
230932	60	12	.24185779 C5 .102 00	.0708
231032	60	12	.24576585 C5 .102 00	.0393
231132	60	12	.24953848 C5 .102 C0	.0099
231232	60	12	.25319131 C5 .102 CC	-.0144
231332	60	12	.25671504 C5 .102 C0	-.0464
231432	60	12	.26009543 C5 .102 00	-.0684
231532	60	12	.26331722 C5 .102 C0	-.0967
231632	60	12	.26636410 C5 .102 C0	-.1099
231732	60	12	.26921879 C5 .102 C0	-.1208
231832	60	12	.27186292 05 .102 CC	-.1509
231932	60	12	.27427711 C5 .102 00	-.1777
232032	60	12	.27644097 C5 .102 00	-.1807
232132	60	12	.27833317 05 .103 00	-.1924
232232	60	12	.27993145 C5 .103 C0	-.1997

TABLE VIII.- CORRECT STANDARD CM ORBIT - Continued

[Seventh iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045750.0

TIME H M S	TC	Q	CC3		
232332	60	12	.28121295	05 .103 00	-.1948
232532	60	12	.28273030	05 .103 00	-.1714
232632	60	12	.28291771	05 .103 00	-.1548
232732	60	12	.28269180	05 .103 00	-.1304
232832	60	12	.28202846	05 .103 00	-.1234
232932	60	12	.28090415	05 .103 00	-.1067
233032	60	12	.27925640	05 .103 00	-.0986
233132	60	12	.27718407	05 .103 00	-.0825
233232	60	12	.27454785	05 .103 00	-.0911
233332	60	12	.27137093	05 .103 00	-.0852
233432	60	12	.26763904	05 .103 00	-.1204
233532	60	12	.26334138	05 .103 00	-.1714

DATA STATISTICS STATION 12 ITERATION 7

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-233532	304	.103 00	.110 00	-.382-01	.120-01

TABLE VIII.- CORRECT STANDARD CM ORBIT - Concluded

[Seventh iteration vector]

STATION NUMBER 61 66/08/14 ITERATION NUMBER 7 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME	TC	Q	CC3	C3	
H M S					
171031	60	12		-.16015829 05 .114 00	-.2217
171131	60	12		-.16183544 05 .114 00	-.2319
171231	60	12		-.16331221 05 .114 00	-.2300
171331	60	12		-.16459752 05 .115 00	-.2407
171431	60	12		-.16569997 05 .115 00	-.2378
171531	60	12		-.16662782 05 .115 00	-.2275
171631	60	12		-.16738901 05 .116 00	-.2256
171731	60	12		-.16799107 05 .116 00	-.2192
171831	60	12		-.16844125 05 .117 00	-.2017
171931	60	12		-.16874645 05 .118 00	-.1895
172031	60	12		-.16891327 05 .118 00	-.1914
172131	60	12		-.16894796 05 .119 00	-.1724
172231	60	12		-.16885650 05 .119 00	-.1768
172331	60	12		-.16864455 05 .120 00	-.1548
172431	60	12		-.16831750 05 .121 00	-.1514
172531	60	12		-.16788048 05 .122 00	-.1284
172631	60	12		-.16733834 05 .123 00	-.1174
172731	60	12		-.16669567 05 .123 00	-.1086
172831	60	12		-.16595687 05 .124 00	-.1055
173231	60	12		-.16211989 05 .128 00	-.0703
173331	60	12		-.16095831 05 .129 00	-.0621
173431	60	12		-.15972239 05 .131 00	-.0627
173531	60	12		-.15841510 05 .132 00	-.0494
173631	60	12		-.15703929 05 .134 00	-.0475
173731	60	12		-.15559761 05 .135 00	-.0404
173831	60	12		-.15409259 05 .137 00	-.0419

DATA STATISTICS STATION 61 ITERATION 7

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.705-01	.166 00	-.150 00	.275-01

TABLE IX.- OLD STANDARD CM ORBIT

[Fourth iteration vector]

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.24391606 07	-.73649713 07	-.21931017 07	.10163858 11	-.47274990 10	.48000889 09
Y	-.73649713 07	.29682874 10	.11781053 10	-.43066777 13	.58888629 12	-.86155289 12
Z	-.21931017 07	.11781053 10	.46794100 09	-.17094334 13	.23268318 12	-.34238432 12
DX	.10163858 11	-.43066777 13	-.17094334 13	.62502247 16	-.85383438 15	.12507723 16
DY	-.47274990 10	.58888629 12	.23268318 12	-.85383438 15	.12135662 15	-.16868759 15
DZ	.48000889 09	-.86155289 12	-.34238432 12	.12507723 16	-.16868759 15	.25136136 15

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.86556141-01	.64914695-01	-.82317198-01	.27477646 00	-.19385625-01
Y	.86556141-01	-.10000000 01	-.99962147 00	.99986549 00	-.98117561 00	.99742377 00
Z	.64914695-01	-.99962147 00	-.10000000 01	.99955992 00	-.97642237 00	.99831837 00
DX	-.82317198-01	.99986549 00	.99955992 00	-.10000000 01	.98037922 00	-.99788655 00
DY	.27477646 00	-.98117561 00	-.97642237 00	.98037922 00	-.10000000 01	.96583322 00
DZ	-.19385625-01	.99742377 00	.99831837 00	-.99788655 00	.96583322 00	-.10000000 01

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

CASE 0 - MSC

ITERATION NUMBER 4 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .36487 05 QSOS .36487 05

X 205721442270152047126433 Y 213676453567160151516765 Z 212551464242157566004004

DX 601705164357546315172120 DY 176627347257143501550615 DZ 577601005726544350702202

000000 234435254222000000000000

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q Standard orbit	NOMINAL Q Start vector	DQ(NOM)
X	.13635121-05	.51808824-02	.10000000 02	.29097943 02	.29097944 02	.28102268 02	.99567628 00
Y	.15017284-03	.12438911-01	.10000000 02	.17863415 04	.17863416 04	.17868838 04	-.54212952 00
Z	-.30349626-03	.30656039-01	.10000000 02	.72320466 03	.72320436 03	.72176532 03	.14390411 01
DX	-.11115582-06	.12608129-04	.99999998-02	-.17704197 01	-.17704198 01	-.17710436 01	.62377750-03
DY	-.30128544-06	.29247296-04	.99999998-02	.19895140 00	.19895109 00	.19722083 00	.17302651-02
DZ	.45363479-06	.43717803-04	.99999998-02	-.37598830 00	-.37598785 00	-.37411746 00	-.18703937-02

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.26841543-04	-.36654953-04	.88318745-04	.36048086-07	.94984528-07	-.12101839-06
Y	-.36654953-04	.15472651-03	-.37954723-03	-.15392369-06	-.36023061-06	.53758742-06
Z	.88318745-04	-.37954723-03	.93979279-03	.38388334-06	.89083877-06	-.13333365-05
DX	.36048086-07	-.15392369-06	.38388334-06	.15896492-09	.36623492-09	-.54998390-09
DY	.94984528-07	-.36023061-06	.89083877-06	.36623492-09	.85540433-09	-.12697834-08
DZ	-.12101839-06	.53758742-06	-.13333365-05	-.54998390-09	-.12697834-08	.19112464-08

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.26841543-04	-.36654953-04	.88318745-04	.36048086-07	.94984528-07	-.12101839-06
Y	-.36654953-04	.15472651-03	-.37954723-03	-.15392369-06	-.36023061-06	.53758742-06
Z	.88318745-04	-.37954723-03	.93979279-03	.38388334-06	.89083877-06	-.13333365-05
DX	.36048086-07	-.15392369-06	.38388334-06	.15896492-09	.36623492-09	-.54998390-09
DY	.94984528-07	-.36023061-06	.89083877-06	.36623492-09	.85540433-09	-.12697834-08
DZ	-.12101839-06	.53758742-06	-.13333365-05	-.54998390-09	-.12697834-08	.19112464-08

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.56878293 00	.55607464 00	.55185860 00	.62684967 00	-.53430507 00
Y	-.56878293 00	.10000000 01	-.99533071 00	-.98145965 00	-.99017628 00	.98857220 00
Z	.55607464 00	-.99533071 00	.10000000 01	.99319050 00	.99356739 00	-.99486785 00
DX	.55185860 00	-.98145965 00	.99319050 00	.10000000 01	.99316952 00	-.99779425 00
DY	.62684967 00	-.99017628 00	.99356739 00	.99316952 00	.10000000 01	-.99308311 00
DZ	-.53430507 00	.98857220 00	-.99486785 00	-.99779425 00	-.99308311 00	.10000000 01

ODP COMPUTING RESIDUALS-STATISTICS

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 41 66/08/15 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045640.0

TIME H M S	TC	Q	CC3				
002332	60	41	-.17755843	05	.102	00	-.8242
002432	60	41	-.17998879	05	.102	00	-.8203
002532	60	41	-.18219708	05	.102	00	-.8750
002632	60	41	-.18419239	05	.102	00	-.8770
002732	60	41	-.18598358	05	.102	00	-.9082
002832	60	41	-.18757924	05	.102	00	-.9082
002932	60	41	-.18898762	05	.102	00	-.9043
003032	60	41	-.19021671	05	.102	00	-.9121
003132	60	41	-.19127421	05	.102	00	-.9121
003232	60	41	-.19216745	05	.102	00	-.9043
003332	60	41	-.19290353	05	.102	00	-.8965
003432	60	41	-.19348918	05	.102	00	-.8828
003532	60	41	-.19393089	05	.102	00	-.8770
003632	60	41	-.19423481	05	.102	00	-.8535
003732	60	41	-.19440684	05	.102	00	-.8496
003832	60	41	-.19445260	05	.102	00	-.8398
003932	60	41	-.19437745	05	.102	00	-.8223
004032	60	41	-.19418645	05	.102	00	-.8047
004132	60	41	-.19388448	05	.102	00	-.7852
004232	60	41	-.19347611	05	.102	00	-.7715
004332	60	41	-.19296573	05	.102	00	-.7598
004432	60	41	-.19235751	05	.102	00	-.7500
004532	60	41	-.19165538	05	.102	00	-.7129
004632	60	41	-.19086307	05	.102	00	-.7090
004732	60	41	-.18998418	05	.102	00	-.6992
004832	60	41	-.18902206	05	.102	00	-.6602
004932	60	41	-.18797990	05	.102	00	-.6602
005032	60	41	-.18686075	05	.102	00	-.6250
005132	60	41	-.18566748	05	.102	00	-.6191
005232	60	41	-.18440281	05	.102	00	-.6016
005332	60	41	-.18306932	05	.102	00	-.5840
005432	60	41	-.18166947	05	.102	00	-.5527
005532	60	41	-.18020557	05	.102	00	-.5430
005632	60	41	-.17867982	05	.102	00	-.5176
005732	60	41	-.17709428	05	.102	00	-.5059
005832	60	41	-.17545094	05	.102	00	-.4727
005932	60	41	-.17375164	05	.102	00	-.4697
010032	60	41	-.17199815	05	.102	00	-.4512
010132	60	41	-.17019214	05	.102	00	-.4189
010232	60	41	-.16833519	05	.102	00	-.4150
010332	60	41	-.16642877	05	.102	00	-.3896
010432	60	41	-.16447430	05	.102	00	-.3535
010532	60	41	-.16247310	05	.102	00	-.3564

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 41 66/08/15 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045640.0

TIME H M S	TC	Q	CC3			
010632	60	41	-.16042644	05	.102 00	-.3389
010732	60	41	-.15833549	05	.102 00	-.3008
010832	60	41	-.15620136	05	.102 00	-.2949
010932	60	41	-.15402515	05	.102 00	-.2852
011032	60	41	-.15180781	05	.102 00	-.2695
011132	60	41	-.14955028	05	.102 00	-.2393
011232	60	41	-.14725343	05	.102 00	-.2231
011332	60	41	-.14491812	05	.102 00	-.2051
011432	60	41	-.14254509	05	.102 00	-.1909
011532	60	41	-.14013510	05	.102 00	-.1733
011632	60	41	-.13768881	05	.102 00	-.1689
011732	60	41	-.13520688	05	.102 00	-.1460
011832	60	41	-.13268990	05	.102 00	-.1101
011932	60	41	-.13013841	05	.102 00	-.1091
012032	60	41	-.12755296	05	.102 00	-.1042
012132	60	41	-.12493401	05	.102 00	-.0823
012232	60	41	-.12228202	05	.102 00	-.0645
012332	60	41	-.11959742	05	.102 00	-.0581
012432	60	41	-.11688057	05	.102 00	-.0426
012532	60	41	-.11413184	05	.102 00	-.0323
012632	60	41	-.11135155	05	.102 00	-.0112
012732	60	41	-.10854001	05	.102 00	.0016
012832	60	41	-.10569746	05	.102 00	-.0035
012932	60	41	-.10282418	05	.102 00	.0348
013032	60	41	-.95920377	04	.102 00	.0219
013132	60	41	-.96986239	04	.102 00	.0405
013232	60	41	-.94021951	04	.102 00	.0618
013332	60	41	-.91027667	04	.102 00	.0669
013432	60	41	-.88003523	04	.102 00	.0891
013532	60	41	-.84949615	04	.102 00	.0786
013632	60	41	.81866066	4	.102 00	.1067
013732	60	41	-.78752939	04	.102 00	.0940
013832	60	41	-.75610284	04	.102 00	.1118
013932	60	41	-.72438163	04	.102 00	.1162
014032	60	41	-.69236586	04	.102 00	.1255
014132	60	41	-.66005582	04	.102 00	.1416
014232	60	41	-.62745145	04	.102 00	.1313
014332	60	41	-.59455268	04	.102 00	.1602
014432	60	41	-.56135920	04	.102 00	.1421
014532	60	41	-.52787061	04	.102 00	.1729
014632	60	41	-.49408652	04	.102 00	.1650
014732	60	41	-.46000627	04	.102 00	.1792
014832	60	41	-.42562930	04	.102 00	.1763

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 41 66/08/15 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045640.0

TIME H M S	TC	Q	CC3			
014932	60	41	-.39095477	04	.102 00	.1978
015032	60	41	-.35598196	04	.102 00	.1865
015132	60	41	-.32070994	04	.102 00	.1992
015232	60	41	-.28513772	04	.102 00	.1938
015332	60	41	-.24926447	04	.102 00	.2114
015432	60	41	-.21308904	04	.102 00	.2070
015532	60	41	-.17661050	04	.102 00	.2051
015632	60	41	-.13982778	04	.102 00	.2109
015732	60	41	-.10273989	04	.102 00	.2158
015832	60	41	-.65345787	03	.102 00	.2080
015932	60	41	-.27644452	03	.102 00	.1943
020032	60	41	.10364949	03	.102 00	.2173
020132	60	41	.48683361	03	.102 00	.2163
020232	60	41	.87311567	03	.102 00	.2012
020332	60	41	.12625019	04	.102 00	.2148
020432	60	41	.16549981	04	.102 00	.2021
020532	60	41	.20506085	04	.102 00	.1914
020632	60	41	.24493358	04	.102 00	.1978
020732	60	41	.28511803	04	.102 00	.2031
020832	60	41	.32561402	04	.102 00	.1763
020932	60	41	.36642106	04	.102 00	.1895
021032	60	41	.40753854	04	.102 00	.1978
021132	60	41	.44896532	04	.102 00	.1802
021232	60	41	.49070003	04	.102 00	.1665
021332	60	41	.53274083	04	.102 00	.1582
021432	60	41	.57508538	04	.102 00	.1631
021532	60	41	.61773104	04	.102 00	.1563
021632	60	41	.66067435	04	.102 00	.1396
021732	60	41	.70391135	04	.102 00	.1367
021832	60	41	.74743739	04	.102 00	.1260
021932	60	41	.79124705	04	.102 00	.1128
022032	60	41	.83533410	04	.102 00	.1089
022132	60	41	.87969133	04	.102 00	.0867
022232	60	41	.92431062	04	.102 00	.0771
022332	60	41	.96918257	04	.102 00	.0742
022432	60	41	.10142967	05	.102 00	.0492
022532	60	41	.10596413	05	.102 00	.0533
022632	60	41	.11052029	05	.102 00	.0039
022732	60	41	.11509667	05	.102 00	.0164
022832	60	41	.11969159	05	.102 00	-.1259
022932	60	41	.12430320	05	.102 00	-.1367
023032	60	41	.12892943	05	.102 00	-.1597
023132	60	41	.13356799	05	.102 00	-.0825

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 41- [illegible] 66/08/15 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045640.0

TIME H M S	TC	Q	CCS				
023232	60	41	.13821634	05	.102	00	-.1169
023332	60	41	.14287166	05	.102	00	-.1323
023432	60	41	.14753084	05	.102	00	-.1841
023532	60	41	.15219046	05	.102	00	-.2129
023632	60	41	.15684674	05	.102	00	-.2578
023732	60	41	.16149553	05	.102	00	-.3037
023832	60	41	.16613229	05	.102	00	-.3623
023932	60	41	.17075198	05	[illegible]	[illegible]	-.3984
024032	60	41	.17534915	05	[illegible]	[illegible]	.4648
024132	60	41	.17991779	05	.102	00	.5137
024232	60	[illegible]	.18445138	[illegible]	[illegible]	[illegible]	-.5879
024332	60	41	.18894273	[illegible]	[illegible]	00	-.6738
024432	60	[illegible]	.19338400	[illegible]	[illegible]	[illegible]	.7246
024532	60	41	.19776697	05	.102	00	-.8125
024632	60	41	.20208217	[illegible]	[illegible]	[illegible]	-.8846
024732	60	41	.20631971	[illegible]	[illegible]	[illegible]	.9651
024832	60	41	.21046881	[illegible]	[illegible]	[illegible]	-1.0465
024932	60	41	.21451777	05	[illegible]	[illegible]	-1.1094
025032	60	41	.21845402	[illegible]	[illegible]	[illegible]	-1.1875
025132	60	41	.22226402	[illegible]	[illegible]	[illegible]	-1.2539
025232	60	41	.22593321	[illegible]	[illegible]	[illegible]	-1.3203
025332	60	41	.22944604	[illegible]	[illegible]	[illegible]	-1.3555
025432	60	41	.23278592	[illegible]	[illegible]	[illegible]	-1.4132
025532	60	41	.23593314	[illegible]	[illegible]	00	-1.4648
025632	60	41	.23887497	[illegible]	[illegible]	[illegible]	-1.5156
025732	60	41	.24158362	[illegible]	[illegible]	00	-1.5272
025832	60	41	.24423713	[illegible]	[illegible]	00	-1.5425
030032	60	41	.24721255	[illegible]	[illegible]	[illegible]	-1.5391
030132	60	41	.24970608	05	.102	00	-1.5234
030232	60	41	.25094063	05	.102	00	-1.4648
030332	60	41	.25180869	05	.102	00	-1.4023
030432	60	41	.25228548	05	.102	00	-1.3320
030532	60	41	.25234622	05	.102	00	-1.2383
030632	60	41	.25196653	05	.102	00	-1.1211
030732	60	41	.25112265	05	.102	00	-.9980
030832	60	41	.24979188	05	.102	00	-.8711
030932	60	41	.24795304	05	.102	00	-.7031
031032	60	41	.24558688	05	.102	00	-.5371
031132	60	41	.24267660	05	.102	00	-.3604
031232	60	41	.23920832	05	.102	[illegible]	-.1987
031332	60	41	.23517158	05	.102	00	-.0081
031432	60	41	.23055988	05	.102	00	.1455
040132	60	41	-.12782234	[illegible]	.103	00	-2.1958

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 41 66/08/15 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045660.0

TIME H M S	TC	Q		CC3	
040232	60	41	-.13021362 05	.103 00	-2.2422
040332	60	41	-.13256755 05	.103 00	-2.2125
040432	60	41	-.12465301 05	.103 00	-2.2359
040532	60	41	-.13651856 05	.103 00	-2.2750
040632	60	41	-.13019251 05	.103 00	-2.3984
040732	60	41	-.13968290 05	.103 00	-2.4063
040832	60	41	-.14099748 05	.103 00	-2.4219
040932	60	41	-.14214368 05	.103 00	-2.3984
041032	60	41	-.14212866 05	.103 00	-2.3828
041132	60	41	-.14395929 05	.103 00	-2.3906
041232	60	41	-.14464212 05	.103 00	-2.3516
041332	60	41	-.14518346 05	.103 00	-2.3203
041432	60	41	-.14556929 05	.103 00	-2.3047
041532	60	41	-.14586535 05	.103 00	-2.2656
041632	60	41	-.14601711 05	.103 00	-2.2422
041732	60	41	-.14614974 05	.103 00	-2.1875
041832	60	41	-.14558827 05	.103 00	-2.1406
041932	60	41	-.14577737 05	.103 00	-2.1094
042032	60	41	-.14548159 05	.103 00	-2.0625
042132	60	41	-.14500505 05	.103 00	-1.9961
042232	60	41	-.14459194 05	.103 00	-1.9727
042332	60	41	-.14400609 05	.103 00	-1.9062
042432	60	41	-.14333118 05	.103 00	-1.8359
042532	60	41	-.14257060 05	.103 00	-1.8047
042632	60	41	-.14172779 05	.103 00	-1.7266
042732	60	41	-.14085561 05	.103 00	-1.6836
042832	60	41	-.13995743 05	.103 00	-1.6250
042932	60	41	-.13873574 05	.103 00	-1.5430
043032	60	41	-.13759335 05	.103 00	-1.5000
043132	60	41	-.13638279 05	.103 00	-1.4258

DATA STATISTICS STATION 41 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
05/226	CC3	8/15-002332	8/15-043132	202	.790 00	.101 01	-.622 00	.101 01

TABLE IX. - OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3			
171032	60	12	-.18993051	05	.100 00	1.1094
171132	60	12	-.19153935	05	.100 00	1.1752
171232	60	12	-.19294645	05	.100 00	1.2539
171332	60	12	-.19416078	05	.100 00	1.3125
171432	60	12	-.19519088	05	.100 00	1.3711
171532	60	12	-.19604499	05	.100 00	1.4180
171632	60	12	-.19673104	05	.100 00	1.4531
171732	60	12	-.19725656	05	.100 00	1.4961
171832	60	12	-.19762879	05	.100 00	1.5273
171932	60	12	-.19785463	05	.100 00	1.5469
172032	60	12	-.19794066	05	.100 00	1.5664
172132	60	12	-.19789315	05	.100 00	[illegible]
172232	60	12	-.19771807	05	.100 00	[illegible]
172332	60	12	-.19742110	05	.100 00	[illegible]
172432	60	12	-.19700763	05	.100 00	[illegible]
172532	60	12	-.19648278	05	.100 00	[illegible]
172632	60	12	-.19585142	05	.100 00	1.5664
172732	60	12	-.19511817	05	.100 00	1.5509
172832	60	12	-.19428741	05	.100 00	1.5313
172932	60	12	-.19336328	05	.100 00	1.5039
17 0 2	60	12	-H192 4972	05	H100 00	1.4883
173132	60	12	-.19125048	05	.100 00	1.4570
173232	60	12	-.19006906	05	.100 00	1.4297
173332	60	12	-.18880882	05	.100 00	1.3984
173432	60	12	-.18747293	05	.100 00	1.3594
173532	60	12	-.18606440	05	.100 00	1.3242
173632	60	12	-.18458605	05	.100 00	1.2891
173732	60	12	-.18304058	05	.100 00	1.2500
173832	60	12	-.18143051	05	.100 00	1.2031
173932	60	12	-.17975828	05	.100 00	1.1602
174032	60	12	-.17802614	05	.100 00	1.1211
174132	60	12	-.17623624	05	.100 00	1.0742
174232	60	12	-.17439063	05	.100 00	1.0313
174332	60	12	-.17249119	05	.100 00	.9863
174432	60	12	-.17053979	05	.100 00	.9297
174532	60	12	-.16853812	05	.100 00	.8867
174632	60	12	-.16648781	05	.100 00	.8398
174732	60	12	-.16439037	05	.100 00	.7871
174832	60	12	-.16224727	05	.100 00	.7363
174932	60	12	-.16005987	05	.100 00	.6953
175032	60	12	-.15782945	05	.100 00	.6367
175132	60	12	-.15555722	05	.100 00	.5898
175232	60	12	-.15324434	05	.100 00	.5352

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3				
175332	60	12	-.15089188	05	.100	00	.4883
175432	60	12	-.14850085	05	.100	00	.4355
175532	60	12	-.14607222	05	.100	00	.3887
175632	60	12	-.14360688	05	.100	00	.3301
175732	60	12	-.14110567	05	.100	00	.2842
175832	60	12	-.13856940	05	.100	00	.2319
175932	60	12	-.13599881	05	.100	00	.1812
180032	60	12	-.13339460	05	.100	00	.1353
180132	60	12	-.13075742	05	.100	00	.0920
180232	60	12	-.12808789	05	.100	00	.0305
180332	60	12	-.12538657	05	.100	00	-.0094
180432	60	12	-.12265401	05	.100	00	-.0652
180532	60	12	-.11989070	05	.100	00	-.1047
180632	60	12	-.11709711	05	.100	00	-.1470
180732	60	12	-.11427367	05	.100	00	-.1997
180832	60	12	-.11142077	05	.100	00	-.2476
180932	60	12	-.10853879	05	.100	00	-.2793
181032	60	12	-.10562806	05	.100	00	-.3359
181132	60	12	-.10268889	05	.100	00	-.3691
181232	60	12	-.99721587	04	.100	00	-.4160
181332	60	12	-.96726397	04	.100	00	-.4521
181432	60	12	-.93703561	04	.100	00	-.4941
181532	60	12	-.90653300	04	.100	00	-.5371
181632	60	12	-.87575801	04	.100	00	-.5625
181832	60	12	-.81339773	04	.100	00	-.6387
181932	60	12	-.78181527	04	.100	00	-.6719
182032	60	12	-.74996636	04	.100	00	-.7031
182132	60	12	-.71785180	04	.100	00	-.7402
182232	60	12	-.68547254	04	.100	00	-.7656
182332	60	12	-.65282935	04	.100	00	-.7988
182432	60	12	-.61992270	04	.100	00	-.8223
182532	60	12	-.58675300	04	.100	00	-.8535
182632	60	12	-.55332061	04	.100	00	-.8691
182732	60	12	-.51962567	04	.100	00	-.9023
182832	60	12	-.48566831	04	.100	00	-.9258
182932	60	12	-.45144843	04	.100	00	-.9414
183032	60	12	-.41696595	04	.100	00	.9570
183132	60	12	-.38222072	04	.100	00	-.9766
183232	60	12	-.34721240	04	.100	00	-.9844
183332	60	12	-.31194071	04	.100	00	-1.0078
184332	60	12	.55361256	03	.100	00	-1.0391
184432	60	12	.93560118	03	.100	00	-1.0352
184532	60	12	.13202743	04	.100	00	-1.0234

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3			
184632	60	12	.17076330	04	.100 00	-1.0078
184732	60	12	.20976771	04	.100 00	-.9941
184832	60	12	.24904055	04	.100 00	-.9727
184932	60	12	.28858146	04	.100 00	-.9648
185032	60	12	.32838994	04	.100 00	-.9414
185132	60	12	.36846527	04	.100 00	-.9102
185232	60	12	.40880644	04	.100 00	-.8887
185332	60	12	.44941216	04	.100 00	-.8633
185432	60	12	.49028094	04	.100 00	-.8262
185532	60	12	.53141082	04	.100 00	-.7910
185632	60	12	.57279947	04	.100 00	-.7617
185732	60	12	.61444426	04	.100 00	-.7168
190332	60	12	.86947135	04	.100 00	.4473
190432	60	12	.91278569	04	.100 00	.3740
190532	60	12	.95631251	04	.100 00	.3352
190632	60	12	.10000426	05	.100 00	.2676
190732	60	12	.10439657	05	.100 00	.1992
190832	60	12	.10880704	05	.100 00	.1377
190932	60	12	.11323439	05	.100 00	.0723
191032	60	12	.11767718	05	.100 00	.0020
191132	60	12	.12213386	05	.100 00	.0645
191232	60	12	.12660265	05	.100 00	.1353
191332	60	12	.13108162	05	.100 00	.2051
191432	60	12	.13556862	05	.100 [illegible]	.2783
191532	60	12	.14006132	[illegible]	.100 [illegible]	.3506
191632	60	12	.14455711	[illegible]	.100 [illegible]	.4229
191732	60	12	.14905309	05	.100 [illegible]	.4912
191832	60	12	.15354616	05	.100 [illegible]	.5664
191932	60	12	.15802285	[illegible]	.100 [illegible]	.6309
192032	60	12	.16250937	[illegible]	.100 [illegible]	.6953
192132	60	12	.16697159	5	.100 [illegible]	.7656
192232	60	12	.17141497	5	.100 [illegible]	.8281
192332	60	12	.17583455	5	.100 [illegible]	.8867
192432	60	12	.18022492	5	.100 [illegible]	.9414
192532	60	12	.18458020	[illegible]	1 [illegible]	.9882
192632	[illegible]	[illegible]	.18889394	[illegible]	[illegible]	1.0291
192732	[illegible]	[illegible]	.19315919	[illegible]	[illegible]	1.0620
192832	[illegible]	[illegible]	.19736832	[illegible]	[illegible]	1.1250
192932	6	[illegible]	.20151312	[illegible]	[illegible]	1.1563
193032	[illegible]	[illegible]	.20558462	[illegible]	[illegible]	1.1953
193132	[illegible]	12	.20957322	[illegible]	[illegible]	1.2188
193232	[illegible]	12	.21346842	[illegible]	[illegible]	1.2500
193332	60	12	.21725902	05	.100 00	1.2656

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 12 65/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3			
193432	60	12	.22093284	05	.100	00	1.3008
193532	60	12	.22447689	05	.100	00	1.3008
193632	60	12	.22787720	05	.100	00	1.3281
193732	60	12	.23111884	05	.100	00	1.3320
193832	60	12	.23418589	05	.100	00	1.3281
193932	60	12	.23706140	05	.100	00	1.3516
195232	60	12	.24766837	05	.100	00	.7051
195332	60	12	.24562979	05	.100	00	.5879
195432	60	12	.24307297	05	.100	00	.4609
195532	60	12	.23998076	05	.100	00	.3076
195632	60	12	.23633868	05	.100	00	.1235
195815	10	12	.22879670	05	.246	00	-.2705
195825	10	12	.22797280	05	.246	00	-.2803
195835	10	12	.22713300	05	.246	00	-.3506
195845	10	12	.22627728	05	.246	00	-.3779
204132	60	12	-.12446587	05	.101	00	-.2129
204232	60	12	-.12780830	05	.101	00	-.1870
204332	60	12	-.13088478	05	.101	00	-.1553
204432	60	12	-.13370567	05	.101	00	-.1248
204532	60	12	-.13628119	05	.101	00	-.0974
204632	60	12	-.13862137	05	.101	00	-.0624
204732	60	12	-.14073603	05	.101	00	-.0216
204832	60	12	-.14263471	05	.101	00	.0131
204932	60	12	-.14432668	05	.101	00	.0426
205032	60	12	-.14582089	05	.101	00	.0896
205132	60	12	-.14712601	05	.101	00	.1177
205232	60	12	-.14825034	05	.101	00	.1509
205332	60	12	-.14920191	05	.101	00	.1831
205432	60	12	-.14998838	05	.101	00	.2222
205532	60	12	-.15061709	05	.101	00	.2432
205632	60	12	-.15109507	05	.101	00	.2656
205732	60	12	-.15142903	05	.101	00	.2949
205832	60	12	-.15162537	05	.101	00	.3125
205932	60	12	-.15169019	05	.101	00	.3359
210032	60	12	-.15162930	05	.101	00	.3467
210132	60	12	-.15144825	05	.101	00	.3584
210232	60	12	-.15115226	05	.101	00	.3770

TABLE IX.- OLD STANDARD CM ORBIT - Continued

[Fourth iteration vector]

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC?			
210332	60	12	-.15074635	05	.101 00	.3770
210432	60	12	-.15023527	05	.101 00	.3936
210532	60	12	-.14962350	05	.101 00	.3916
210632	60	12	-.14891534	05	.101 00	.4004
210732	60	12	-.14811484	05	.101 00	.4004
210832	60	12	-.14722586	05	.101 00	.4023
210932	60	12	-.14625201	05	.101 00	.4014
211032	60	12	-.14519678	05	.101 00	.3945
211132	60	12	.14406343	05	.101 00	.4014
211232	60	12	.14285507	05	[illegible]	.3906
211332	60	12	-.14157465	05	.101 00	.3896
211432	60	12	.14022492	05	.101 00	.3838
211532	60	12	-.13880853	05	.101 00	.3779
211632	60	12	-.12732799	05	.101 00	.3740
211732	60	12	.13578864	05	.101 00	.3643
211832	60	12	-.13418372	05	.101 00	.3555
211932	[illegible]	[illegible]	.13252434	05	.101 00	.3428
212032	60	12	-.13086951	05	.101 00	.3340
212132	60	12	-.12904110	05	.101 00	.3262
212232	[illegible]	[illegible]	-.12722090	05	[illegible]	.3154
212332	60	12	.12535061	05	.101 00	.3027
212432	6	12	.12343181	5	.101 00	.2900
212532	60	12	.12146693	5	.101 00	.2861
212632	60	12	.11945467	5	.101 00	.2666
212732	60	12	.11739907	[illegible]	[illegible]	.2578
212832	[illegible]	12	.11530652	5	.101 00	.2441
212932	60	12	-.11316.19	5	.101 00	.2280
213032	60	12	-.11097924	[illegible]	.101 00	.2036
213132	60	12	.10875879	5	.101 00	.1948
213232	[illegible]	12	.10649059	5	.101 00	.1919
213332	[illegible]	12	.10420282	[illegible]	.101 00	.1748
213432	[illegible]	[illegible]	-.10186933	05	[illegible] 00	.1577
213532	[illegible]	[illegible]	.99499907	04	[illegible] 00	.1406
213632	6	12	.97095351	4	.101 00	.1353
213732	60	12	.94656382	04	.101 00	.1237
213832	[illegible]	12	.92183697	04	.101 00	.1030
213932	[illegible]	[illegible]	.89677945	04	[illegible]	.0867
214032	[illegible]	[illegible]	.87139712	04	[illegible]	.0717
214132	6	12	-.84569576	4	.101 00	.0576
214232	[illegible]	[illegible]	-.81968041	[illegible]	.101 00	.0459
214332	60	12	-.79335607	04	.101 00	.0359
214432	60	[illegible]	.76672711	04	[illegible]	.0285
214532	60	12	-.73979795	04	.101 00	.0246

TABLE IX.- OLD STANDARD CM ORBIT - Concluded

[Fourth iteration vector]

```
STATION  NUMBER  12          66/08/14        ITERATION  NUMBER     4        PASS  NUMBER  04/226

                 FREQUENCY2045530.0
 TIME
 H M S    TC  Q                CC3
214632   60  12  -.71257238  04  .101  00        -.0173
214732   60  12  -.68505383  04  .101  00        -.0284
214832   60  12  -.65724570  04  .101  00        -.0347
214932   60  12  -.62915100  04  .101  00        -.0566
215032   60  12  -.60077240  04  .101  00        -.0676
215132   60  12  -.57211250  04  .101  00        -.0750
215232   60  12  -.54317349  04  .101  00        -.0984
215332   60  12  -.51395740  04  .101  00        -.1011
215432   60  12  -.48446596  04  .101  00         .1238
215532   60  12  -.45470089  04  .101  00        -.1245
215632   60  12  -.42466346  04  .101  00        -.1406
215732   60  12  -.39435493  04  .101  00        -.1509
215832   60  12  -.36377635  04  .101  00        -.1616
215932   60  12  -.33292849  04  .101  00        -.1733
220032   60  12  -.30181201  04  .101            -.1885
220132   60  12  -.27042757  04  .101  00         .1909
220332   60  12  -.20635575  04  .101  00        -.2090
220432   60  12  -.17466891  04  .101  00        -.2202
220532   60  12  -.14221458  04  .101  00        -.2207
220632   60  12  -.10949281  04  .101  00        -.2305
220732   60  12  -.76503335  03  .101  00        -.2417
220832   60  12  -.43245826  03  .101  00        -.2500
220932   60  12  -.07198087  02  .101  00        -.2437
221232   60  12   .02474590  03  .101  00        -.2627
221332   60  12   .12708033  04  .101  00        -.2695
221432   60  12   .16195772  04  .101  00        -.2686
221532   60  12   .19710751  04  .101  00        -.2665
221632   60  12   .23253055  04  .101  00        -.2725
221732   60  12   .26822765  04  .101  00        -.2686
221832   60  12   .30419957  04  .101  00        -.2705
221932   60  12   .34044711  04  .101  00        -.2715
222032   60  12   .37697107  04  .101  00        -.2773
222132   60  12   .41377211  04  .101  00        -.2527
222232   60  12   .45085090  04  .101  00        -.2576
222332   60  12   .48820807  04  .101  00        -.2559
222432   60  12   .52584406  04  .101  00        -.2568
222532   60  12   .56375928  04  .101  00        -.2427
222632   60  12   .60195396  04  .101  00        -.2397
222732   60  12   .64042816  04  .101  00        -.2319
222832   60  12   .67918179  04  .101  00        -.2261
222932   60  12   .71821455  04  .101  00        -.2207
ODP NOW OPERATING. PLACE CARDS IN READER.
ERROR FLAG OF CARDS =   000000      -0000-
$EXECUTE        SFOF94
 LRC 7094 MONITOR, VERSION OF 022666
*      NEWEDT
*      ZERODT
 22536*OCT      077400000000
*      END
```

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN Ẋ, Ẏ, Ż)

(a) Case 1: 10-minute arc of 2- and 3-way tracking

ITERATION NUMBER 3 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .35630 00 QSOS .15142 01

X 20570611246015234637775 6 Y 21367644024016055030235 1 Z 21255072635715711621301 3
DX 60170547524654637 6215642 DY 17662274420614370070404 3 DZ 57757465416254406270545 3
000000 23443525422203000000000

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	.40755324-03	.14027337 01	.20000000 01	.28383698 02	.28384105 02	.28779165 02	-.39505911 00
Y	.12549669-02	.85575311 00	.20000000 01	.17862512 04	.17862524 04	.17874292 04	-.11767578 01
Z	-.15470462-02	.12256831 01	.20000000 01	.72183930 03	.72183776 03	.72263366 03	-.79590607 00
DX	-.19527473-06	.96602323-03	.29999999-02	-.17719520 01	-.17719522 01	-.17728667 01	.91445445-03
DY	-.12166311-05	.12797602-02	.29999999-02	.19675211 00	.19675089 00	.19460200 00	.21488908-02
DZ	.12625685-05	.23562780-02	.29999999-02	-.37191178 00	-.37191052 00	-.37165186 00	-.25866190-03

DIFFERENCES

PERICYNTHION

TIME= C. HRS
RAD -C.15853750E C4 VEL 0.13182983E C1 GAM 0.44472516E-03 PSI -C.98057747E-01 RAS -C.68635941E-02
DEC C.98729134E-03 ALT -C.15853437E 04 RCP -0.15864375E 04 SMA -0.69575000E 03 ECC 0.16614422E-03
INC -0.46843767E-01 M M C.11222839E-01 ASN 0.19408035E 00 AOP -0.17831039E 00 TAN C.16544480E-04
CR C.21CE6605E 04 DV C.10068296E C2

ACQUISITION

TIME= 0.63333333E CCHRS
RAD C.12262495E C3 VEL -0.82946777E-01 GAM 0.10744333E-01 PSI -C.22010803E-02 RAS C.52312851E-01
DEC C.81637144E-01 ALT 0.12262499E C3 RCP -0.16371875E 04 SMA -0.91625000E 02 ECC C.17330423E-03
INC -C.46466378E-01 M M 0.15020370E-C2 ASN 0.19327545E 00 AOP -0.63497543E-01 TAN C.15698373E-03
CR C.1451CC55E C5 DV 0.15416212E C1

END OF TRACK

TIME= 0.8CCCCCCCE CC HRS
RAD C.5C950CCCE C3 VEL -0.26330566E CO GAM 0.83353519E-02 PSI 0.21917343E-01 RAS C.42453820E-01
DEC C.79752207E-01 ALT C.5C95000CE 03 RCP -0.14002500E 04 SMA -0.11012500E 03 ECC C.14579296E-03
INC -C.46560764E-01 M M C.18053055E-C2 ASN 0.19311523E CO AOP -0.73104858E-01 TAN C.16555190E-03
CR 0.14722141E C5 DV C.85641940E CO

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(a) Case 1: 10-minute arc of 2- and 3-way tracking

J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.22106998 06	-.42848432 06	-.67218257 05	.51308171 09	-.39386230 09	-.29350943 08
Y	-.42848432 06	.83060931 06	.13036895 06	-.99396603 09	.76353602 09	.57160196 08
Z	-.67218257 05	.13036895 06	.20517512 05	-.15552600 09	.11987920 09	.91758298 07
DX	.51308171 09	-.99396603 09	-.15552600 09	.11937987 13	-.91336481 12	-.66566368 11
DY	-.39386230 09	.76353602 09	.11987920 09	-.91336481 12	.70191105 12	.52688845 11
DZ	-.29350943 08	.57160196 08	.91758298 07	-.66566368 11	.52688845 11	.47096110 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99993473 00	.99806775 00	-.99874841 00	.99985837 00	.90962975 00
Y	.99993473 00	-.10000000 01	-.99865028 00	.99817708 00	-.99997719 00	-.91390868 00
Z	.99806775 00	-.99865028 00	-.10000000 01	.99374532 00	-.99894242 00	-.93344878 00
DX	-.99874841 00	.99817708 00	.99374532 00	-.10000000 01	.99778663 00	.88776252 00
DY	.99985837 00	-.99997719 00	-.99894242 00	.99778663 00	-.10000000 01	-.91640010 00
DZ	.90962975 00	-.91390868 00	-.93344878 00	.88776252 00	-.91640010 00	-.10000000 01

J INVERSE ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.19676618 01	-.91451111 00	.12549867 01	-.55126065-03	.11359365-02	.41706426-03
Y	-.91451111 00	.73231338 00	-.59429180 00	.57146863-03	-.39243040-03	-.96197364-03
Z	.12549867 01	-.59429180 00	.15022990 01	-.10533000-03	.99849026-03	-.55221070-03
DX	-.55126065-03	.57146863-03	-.10533000-03	.93320089-06	.46419587-06	-.21693804-05
DY	.11359365-02	-.39243040-03	.99849026-03	.46419587-06	.16377862-05	-.18649096-05
DZ	.41706426-03	-.96197364-03	-.55221070-03	-.21693804-05	-.18649096-05	.55520459-05

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(a) Case 1: 10-minute arc of 2- and 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.19676618 01	-.91451111 00	.12549867 01	-.55126065-03	.11359365-02	.41706426-03
Y	-.91451111 00	.73231338 00	-.59429180 00	.57146863-03	-.39243040-03	-.96197364-03
Z	.12549867 01	-.59429180 00	.15022990 01	-.10533000-03	.99849026-03	-.55221070-03
DX	-.55126065-03	.57146863-03	-.10533000-03	.93320089-06	.46419587-06	-.21693804-05
DY	.11359365-02	-.39243040-03	.99849026-03	.46419587-06	.16377862-05	-.18649096-05
DZ	.41706426-03	-.96197364-03	-.55221070-03	-.21693804-05	-.18649096-05	.55520459-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.76184263 00	.72993755 00	-.40681242 00	.63277637 00	.12618311 00
Y	-.76184263 00	.99999999 00	-.56659542 00	.69128373 00	-.35833197 00	-.47707665 00
Z	.72993755 00	-.56659542 00	.99999999 00	-.88958266-01	.63655663 00	-.19120538 00
DX	-.40681242 00	.69128373 00	-.88958266-01	.10000000 01	.37547852 00	-.95306302 00
DY	.63277637 00	-.35833197 00	.63655663 00	.37547852 00	.10000000 01	-.61844724 00
DZ	.12618311 00	-.47707665 00	-.19120538 00	-.95306302 00	-.61844724 00	.10000000 01

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(a) Case 1: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3
171032	60 12	-.18991933 05 .100 00	-.0083
171132	60 12	-.19152741 05 .100 00	-.0173
171232	60 12	-.19293384 05 .100 00	-.0073
171332	60 12	-.19414755 05 .100 00	-.0112
171432	60 12	-.19517711 05 .100 00	-.0054
171532	60 12	-.19603076 05 .100 00	-.0076
171632	60 12	-.19671642 05 .100 00	-.0081
171732	60 12	-.19724162 05 .100 00	.0037
171832	60 12	-.19761361 05 .100 00	.0110
171932	60 12	-.19783929 05 .100 00	.0120
172032	60 12	-.19792522 05 .100 00	.0225

DATA STATISTICS STATION 12 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-172032	11	.115-01	.116-01	-.146-02	.135-03

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(a) Case 1: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
171031	60	12		-.16016087 05 .114 00	.0361
171131	60	12		-.16183799 05 .114 00	.0226
171231	60	12		-.16331469 05 .114 00	.0183
171331	60	12		-.16459993 05 .115 00	.0002
171431	60	12		-.16570229 05 .115 00	-.0051
171531	60	12		-.16663005 05 .115 00	-.0046
171631	60	12		-.16739114 05 .116 00	-.0117
171731	60	12		-.16799311 05 .116 00	-.0156
171831	60	12		-.16844320 05 .117 00	-.0063
171931	60	12		-.16874833 05 .118 00	-.0020
172031	60	12		-.16891508 05 .118 00	-.0103

DATA STATISTICS STATION 61 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172031	11	.156-01	.158-01	.196-02	.248-03

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(b) Case 2: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

ITERATION NUMBER 4 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .43779 00 QSOS .19151 01

X	2057051007031525131601 36	Y	21367647635516066212124 0	Z	21255066632115724270636 6
DX	601705414073546333114520	DY	17662341665614301003225 3	DZ	57757560243654446477322 5
CCCCOC	2344352542222CCCCCCCCCCC				

C	DC	STDEVDQ	APRIORI STDEVDQ	CLC C	NEW Q	NOMINAL Q	DQ(NCM)
X	-.37292621-02	.10100684 01	.20000000 01	.28324149 02	.28320420 02	.28779165 02	-.45874476 00
Y	.29018376-02	.64241354 00	.20000000 01	.17864851 04	.17864880 04	.17874292 04	-.94120789 00
Z	-.15428755-02	.80049419 00	.20000000 01	.72171407 03	.72171253 03	.72263366 03	-.92113495 00
DX	.18700534-05	.66802947-03	.29999999-02	-.17715787 01	-.17715768 01	-.17728667 01	.12898852-02
DY	-.23196082-05	.11117895-02	.29999999-02	.19703796 00	.19703564 00	.19460200 00	.24336371-02
DZ	-.30843667-05	.17718283-02	.29999999-02	-.37280453 00	-.37280761 00	-.37165186 00	-.11557564-02

DIFFERENCES

PERICYNTHION

TIME= 0. HRS

RAD	-0.14256875E 04	VEL	0.82305908E 00	GAM	0.17099082E-02	PSI	-0.65839767E-01	RAS	-0.47016144E-02		
DEC	-0.50780773E-02	ALT	-0.14256328E 04	RDP	-0.14326875E 04	SMA	-0.11962500E 04	ECC	0.66079199E-04		
INC	-0.36371946E-01	M M	0.19578934E-01	ASN	0.12380219E 00	AOP	-0.11557198E 00	TAN	0.12126565E-03		
DR	0.16056271E 04	DV	0.67447152E 01								

ACQUISITION

TIME= 0.63333333E 00 HRS

RAD	-0.75500000E 02	VEL	-0.99792480E-01	GAM	0.49238205E-02	PSI	-0.71201324E-02	RAS	0.35388947E-01
DEC	0.55228233E-01	ALT	-0.75531250E 02	RDP	-0.10835625E 04	SMA	-0.60112500E 03	ECC	0.73220581E-04
INC	-0.36028624E-01	M M	0.98533630E-02	ASN	0.12298584E 00	AOP	-0.46494484E-01	TAN	0.19772351E-03
DR	0.98157943E 04	DV	0.15118257E 01						

END OF TRACK

TIME= 0.96666666E 00 HRS

RAD	0.52875000E 02	VEL	-0.21893311E 00	GAM	-0.60176849E-03	PSI	0.23805618E-01	RAS	0.22747040E-01
DEC	0.51717997E-01	ALT	0.52875000E 02	RDP	-0.73156250E 03	SMA	-0.72325000E 03	ECC	0.25071204E-04
INC	-0.36159039E-01	M M	0.11860847E-01	ASN	0.12261200E 00	AOP	-0.68941116E-01	TAN	0.35966933E-03
DR	0.98835322E 04	DV	0.13333130E 01						

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(b) Case 2: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.30958271 06	-.58976972 06	-.84434476 05	.74939946 09	-.54369038 09	-.22876978 08
Y	-.58976972 06	.11249102 07	.16202813 06	-.14241249 10	.10367567 10	.45689070 08
Z	-.84434476 05	.16202813 06	.24061139 05	-.20123284 09	.14915548 09	.81107197 07
DX	.74939946 09	-.14241249 10	-.20123284 09	.18252140 13	-.13131246 13	-.48956282 11
DY	-.54369038 09	.10367567 10	.14915548 09	-.13131246 13	.95564698 12	.41900942 11
DZ	-.22876978 08	.45689070 08	.81107197 07	-.48956282 11	.41900942 11	.53754124 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99939048 00	.97830301 00	-.99693799 00	.99957310 00	.56079537 00
Y	.99939048 00	-.10000000 01	-.98485752 00	.99387614 00	-.99992905 00	-.58755361 00
Z	.97830301 00	-.98485752 00	-.10000000 01	.96024907 00	-.98365777 00	-.71317385 00
DX	-.99693799 00	.99387614 00	.96024907 00	-.10000000 01	.99426080 00	.49465265 00
DY	.99957310 00	-.99992905 00	-.98365777 00	.99426080 00	-.10000000 01	-.58461391 00
DZ	.56079537 00	-.58755361 00	-.71317385 00	.49465265 00	-.58461391 00	-.99999999 00

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10202381 01	-.52825888 00	.48172544 00	-.19900512-03	.80375620-03	.26012684-04
Y	-.52825888 00	.41269516 00	-.32438555 00	.20274679-03	-.40891206-03	-.23104921-03
Z	.48172544 00	-.32438555 00	.64079095 00	.20055681-03	.84014562-03	-.88036673-03
DX	-.19900512-03	.20274679-03	.20055681-03	.44626338-06	.29827444-06	-.11302094-05
DY	.80375620-03	-.40891206-03	.84014562-03	.29827444-06	.12360759-05	-.12877651-05
DZ	.26012684-04	-.23104921-03	-.88036673-03	-.11302094-05	-.12877651-05	.31393755-05

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(b) Case 2: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10202381 01	-.52825888 00	.48172544 00	-.19900512-03	.80375620-03	.26012684-04
Y	-.52825888 00	.41269516 00	-.32438555 00	.20274679-03	-.40891206-03	-.23104921-03
Z	.48172544 00	-.32438555 00	.64079095 00	.20055681-03	.84014562-03	-.88036673-03
DX	-.19900512-03	.20274679-03	.20055681-03	.44626338-06	.29827444-06	-.11302094-05
DY	.80375620-03	-.40891206-03	.84014562-03	.29827444-06	.12360759-05	-.12877651-05
DZ	.26012684-04	-.23104921-03	-.88036673-03	-.11302094-05	-.12877651-05	.31393755-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.81410673 00	.55578645 00	-.29492925 00	.71573290 00	.14534924-01
Y	-.81410673 00	.10000000 01	-.63079556 00	.47243675 00	-.57252263 00	-.20298698 00
Z	.55578645 00	-.63079556 00	.10000000 01	.37504520 00	.94400392 00	-.62070294 00
DX	-.29492925 00	.47243675 00	.37504520 00	.10000000 01	.40160381 00	-.95486428 00
DY	.71573290 00	-.57252263 00	.94400392 00	.40160381 00	.99999999 00	-.65372103 00
DZ	.14534924-01	-.20298698 00	-.62070294 00	-.95486428 00	-.65372103 00	.10000000 01

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(b) Case 2: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3
171032	60	12	-.18551528 05 .100 00 -.0134
171132	60	12	-.19152737 05 .100 00 -.0210
171232	60	12	-.19293382 05 .100 00 -.0095
171332	60	12	-.19414754 05 .100 00 -.0125
171432	60	12	-.19517711 05 .100 00 -.0059
171532	60	12	-.19603076 05 .100 00 -.0073
171632	60	12	-.19671641 05 .100 00 -.0093
171732	60	12	-.19724155 05 .100 00 .0007
171832	60	12	-.19761354 05 .100 00 .0039
171932	60	12	-.19783916 05 .100 00 -.0002
172032	60	12	-.19792505 05 .100 00 .0046
172132	60	12	-.19787743 05 .100 00 .0093
172232	60	12	-.19770229 05 .100 00 .0044
172332	60	12	-.19740531 05 .100 00 .0149
172432	60	12	-.19695187 05 .100 00 .0037
172532	60	12	-.19646709 05 .100 00 .0088
172632	60	12	-.19583584 05 .100 00 .0093
172732	60	12	-.19510274 05 .100 00 .0078
172832	60	12	-.19427216 05 .100 00 .0078
172932	60	12	-.19334823 05 .100 00 -.0017
173032	60	12	-.19233491 05 .100 00 .0078

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-173032	21	.918-02	.918-02	.105-03	.842-04

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN Ẋ, Ẏ, Ż) - Continued

(b) Case 2: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
171031	60	12		-.16016083 05 .114 00	.0316
171131	60	12		-.16183759 05 .114 00	.0223
171231	60	12		-.16331472 05 .114 00	.0211
171331	60	12		-.16459999 05 .115 00	.0061
171431	60	12		-.16570238 05 .115 00	.0037
171531	60	12		-.16663016 05 .115 00	.0063
171631	60	12		-.16739125 05 .116 00	-.0007
171731	60	12		-.16799322 05 .116 00	-.0044
171831	60	12		-.16844329 05 .117 00	.0029
171931	60	12		-.16874839 05 .118 00	.0044
172031	60	12		-.16891509 05 .118 00	-.0085
172131	60	12		-.16894967 05 .119 00	-.0015
172231	60	12		-.16885808 05 .119 00	-.0186
172331	60	12		-.16864601 05 .120 00	-.0088
172431	60	12		-.16831884 05 .121 00	-.0176
172531	60	12		-.16788169 05 .122 00	-.0068
172631	60	12		-.16733943 05 .123 00	-.0083
172731	60	12		-.16669665 05 .123 00	-.0117
172831	60	12		-.16595772 05 .124 00	-.0210

DATA STATISTICS STATION 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172831	19	.137-01	.137-01	-.495-03	.189-03

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN Ẋ, Ẏ, Ż) - Continued

(c) Case 3: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION NUMBER    4      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .40422 00    QSOS  .22140 01

  X   2057063167241525335714477      Y   2136765053501601675736 66      Z   2125507401551574371041 45
 DX   6017053572755464116452 20     DY   1766240761511430434043 01     DZ   5775763140445446110261 37
000000 2344352542220000000000000
```

C	CC	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	.15636972-02	.56688026 00	.20000000 01	.28398694 02	.28400258 02	.28779165 02	-.37890673 00
Y	-.15947960-02	.48921821 00	.20000000 01	.17865442 04	.17865426 04	.17874292 04	-.88659668 00
Z	-.69571740-03	.67178209 00	.20000000 01	.72187652 03	.72187583 03	.72263366 03	-.75783539 00
DX	-.24738608-05	.46330066-03	.29999999-02	-.17713550 01	-.17713575 01	-.17728667 01	.15092045-02
DY	-.94521508-06	.83580874-03	.29999999-02	.19732589 00	.19732495 00	.19460200 00	.27229488-02
Z	.60737637-05	.12968536-02	.29999999-02	-.37344218 00	-.37343611 00	-.37165186 00	-.17842501-02

DIFFERENCES

PERICYNTHION

```
TIME= 0.HRS
RAD -0.1055 625E 04 VEL  0.64831543E 00 GAM -0.30044466E-03 PSI -0.44011116E-01 RAS -0.72335197E-02
DEC -0.1198 534E-02 ALT -0.10553391E 04 ROP -0.10533125E 04 SMA -0.66162500E 03 ECC  0.65267086E-04
INC -0.22455215E-01 M M  0.10827765E-01 ASN  0.81585602E-01 AOP -0.77520645E-01 TAN -0.29044226E-04
 DR  0.12955743E 04  DV  0.43964523E 01
```

ACQUISITION

```
TIME= 0.63333333E 00 HRS
RAD -0.62125300E 02 VEL  0.16235352E-01 GAM  0.44183731E-02 PSI -0.32358170E-02 RAS  0.21997452E-01
DEC  0.35569668E-01 ALT -0.62125000E 02 ROP -0.70518750E 03 SMA -0.66375000E 02 ECC  0.72583556E-04
INC -0.22118837E-01 M M  0.10871687E-02 ASN  0.80234528E-01 AOP -0.24708748E-01 TAN  0.37848949E-04
 DR  0.62614713E 04  DV  0.83138666E 00
```

END OF TRACK

```
TIME= 0.11333333E 01 HRS
RAD  0.11031050E 03 VEL -0.13424683E 00 GAM -0.11906674E-02 PSI  0.24409294E-01 RAS  0.94661713E-02
DEC  0.28545338E-01 ALT  0.10987500E 03 ROP -0.34131250E 03 SMA -0.30650000E 03 ECC  0.14055520E-04
INC -0.22281885E-01 M M  0.50277710E-02 ASN  0.79631805E-01 AOP -0.56194305E-01 TAN  0.21582097E-03
 DR  0.55935207E 04  DV  0.13623206E 01
```

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(c) Case 3: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX — ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.32552692 06	-.61357730 06	-.79471427 05	.80425808 09	-.57350523 09	-.15563476 08
Y	-.61357730 06	.11573285 07	.15849205 06	-.14909044 10	.10736843 10	.37804564 08
Z	-.79471427 05	.15849205 06	.26665675 05	-.18848698 09	.14254627 09	.10355148 08
DX	.80425808 09	-.14909044 10	-.18846698 09	.19764173 13	-.13954381 13	-.29332650 11
DY	-.57350523 09	.10736843 10	.14254627 09	-.13954381 13	.10006868 13	.31301897 11
DZ	-.15563476 08	.37804564 08	.10355148 08	-.29332650 11	.31301897 11	.80895891 10

CORRELATIONS BASED ON J MATRIX — ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.99999999 00	.99356324 00	.84741066 00	-.99657654 00	.99871794 00	.30143794 00
Y	.99356324 00	-.10000000 01	-.90179437 00	.98578487 00	-.99769822 00	-.39070834 00
Z	.84741066 00	-.90179437 00	-.10000000 01	.82067348 00	-.87223826 00	-.70472787 00
DX	-.99657654 00	.98578487 00	.82067348 00	-.10000000 01	.99225240 00	.23197905 00
DY	.99871794 00	-.99769822 00	-.87223826 00	.99225240 00	-.10000000 01	-.34790314 00
DZ	.30143794 00	-.39070834 00	-.70472787 00	.23197905 00	-.34790314 00	-.10000000 01

J INVERSE — ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.32135323 00	-.21254825 00	.18225950 00	-.51609582-04	.31518397-03	-.28476030-04
Y	-.21254825 00	.23933446 00	-.23064834 00	.57993525-04	-.26499015-03	.34948289-05
Z	.18225950 00	-.23064834 00	.45129118 00	.15634108-03	.52483436-03	-.61306561-03
DX	-.51609582-04	.57993525-04	.15634108-03	.21464750-06	.20336092-06	-.57901354-06
DY	.31518397-03	-.26499015-03	.52483436-03	.20336092-06	.69857625-06	-.79277080-06
DZ	-.28476030-04	.34948289-05	-.61306561-03	-.57901354-06	-.79277080-06	.16818292-05

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(c) Case 3: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.32135323 00	-.21254825 00	.18225950 00	-.51609582-04	.31518397-03	-.28476030-04
Y	-.21254825 00	.23933446 00	-.23064834 00	.57993525-04	-.26499015-03	.34948289-05
Z	.18225950 00	-.23064834 00	.45129118 00	.15634108-03	.52483436-03	-.61306561-03
DX	-.51609582-04	.57993525-04	.15634108-03	.21464750-06	.20336092-06	-.57901354-06
DY	.31518397-03	-.26499015-03	.52483436-03	.20336092-06	.69857625-06	-.79277080-06
DZ	-.28476030-04	.34948289-05	-.61306561-03	-.57901354-06	-.79277080-06	.16818292-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.76641428 00	.47859749 00	-.19650612 00	.66522089 00	-.38734429-01
Y	-.76641428 00	.10000000 01	-.70180959 00	.25586681 00	-.64806744 00	.55084873-02
Z	.47859749 00	-.70180959 00	.99999999 00	.50232150 00	.93473160 00	-.70370006 00
DX	-.19650612 00	.25586681 00	.50232150 00	.10000000 01	.52516728 00	-.96368447 00
DY	.66522089 00	-.64806744 00	.93473160 00	.52516728 00	.10000000 01	-.73139131 00
DZ	-.38734429-01	.55084873-02	-.70370006 00	-.96368447 00	-.73139131 00	.99999999 00

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN Ẋ, Ẏ, Ż) - Continued

(c) Case 20: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2C4553C.C

TIME HMS	TC	Q	CC3				
171032	6C	12	-.18951932	C5	.100	CC	-.0090
171132	6C	12	-.19152740	C5	.100	00	-.0181
171232	6C	12	-.19293384	C5	.1C0	0C	-.0081
171332	6C	12	-.19414755	C5	.100	00	-.0115
171432	6C	12	-.19517711	C5	.100	00	-.0059
171532	60	12	-.19603075	C5	.100	00	-.0085
171632	6C	12	-.19671638	C5	.1CC	C0	-.0115
171732	6C	12	-.19724156	C5	.1CC	CC	-.0024
171832	60	12	-.19761251	C5	.1CC	CC	.0005
171932	6C	12	-.19783912	C5	.1CC	00	-.0044
172032	60	12	-.19792499	C5	.1C0	00	-.0007
172132	6C	12	-.19787738	C5	.1C0	00	.0042
172232	6C	12	-.19770223	C5	.1CC	00	-.0020
172332	6C	12	-.19740525	C5	.1CC	CC	.0085
172432	6C	12	-.19699181	C5	.1C0	C0	-.0024
172532	6C	12	-.19646703	C5	.100	00	.0032
172632	6C	12	-.19583579	C5	.1C0	00	.0039
172732	60	12	-.19510269	C5	.100	CC	.0029
172832	6C	12	-.19427212	C5	.1CC	C0	.0037
172932	6C	12	-.19334821	C5	.1C0	00	-.0042
173032	60	12	-.19233491	C5	.100	CC	.0073
173132	6C	12	-.19123593	C5	.100	00	.0015
173232	60	12	-.19005482	C5	.1CC	00	.0068
173332	6C	12	-.18879491	C5	.1CC	00	.0073
173432	6C	12	-.18745937	C5	.100	0C	.0037
173532	6C	12	-.18605120	C5	.1C0	0C	.0037
173632	6C	12	-.18457324	C5	.100	00	.0071
173732	6C	12	-.18302816	C5	.10C	00	.0081
173832	6C	12	-.18141852	C5	.1C0	00	.0020
173932	60	12	-.17974671	C5	.1C0	00	.0044
174032	6C	12	-.17801501	C5	.1CC	CC	.0090

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-174032	31	.681-02	.681-02	-.315-04	.464-04

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(c) Case 3: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME H M S	TC	C	CC3	C3
171031	60	12		-.16016079 05 .114 00 .0282
171131	60	12		-.16183796 05 .114 00 .0193
171231	60	12		-.16331471 05 .114 00 .0193
171331	60	12		-.16459958 05 .115 00 .0054
171431	60	12		-.16570238 05 .115 00 .0032
171531	60	12		-.16663016 05 .115 00 .0066
171631	60	12		-.16739126 05 .116 00 -.0002
171731	60	12		-.16799324 05 .116 00 -.0024
171831	60	12		-.16844331 05 .117 00 .0051
171931	60	12		-.16874842 05 .118 00 .0073
172031	60	12		-.16891513 05 .118 00 -.0051
172131	60	12		-.16894971 05 .119 00 .0032
172231	60	12		-.16885814 05 .119 00 -.0127
172331	60	12		-.16864608 05 .120 00 -.0017
172431	60	12		-.16831893 05 .121 00 -.0088
172531	60	12		-.16788179 05 .122 00 .0027
172631	60	12		-.16733954 05 .123 00 .0032
172731	60	12		-.16669678 05 .123 00 .0015
172831	60	12		-.16595787 05 .124 00 -.0056
173231	60	12		-.16212051 05 .128 00 -.0087
173331	60	12		-.16095885 05 .129 00 -.0083
173431	60	12		-.15972284 05 .131 00 -.0171
173531	60	12		-.15841547 05 .132 00 -.0122
173631	60	12		-.15703958 05 .134 00 -.0182
173731	60	12		-.15559784 05 .135 00 -.0176
173831	60	12		-.15409275 05 .137 00 -.0265

DATA STATISTICS STATION 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.122-01	.123-01	-.155-02	.152-03

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN Ẋ, Ẏ, Ż) - Continued

(d) Case 4: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION  NUMBER     3      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .41936 00    QSOS  .22520 01

  X   20570647025415214744277 0      Y   21367650534616046141344 5      Z   21255074274615711454241 7
 DX   60170535554654656735414 5      DY   17662413022214332615711 6      DZ   57757634047254464307752 6
000000 23443525422200000000000000
```

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.18645805-02	.39535026 00	.20000000 01	.28414991 02	.28413127 02	.28779165 02	-.36603785 00
Y	.42822660-03	.45797699 00	.20000000 01	.17865421 04	.17865426 04	.17874292 04	-.88662720 00
Z	.18274071-02	.06126501 00	.20000000 01	.72188468 03	.72188652 03	.72263366 03	-.74714661 00
DX	.18926254-05	.43038014-03	.29999999-02	-.17713466 01	-.17713447 01	-.17728667 01	.15219450-02
DY	.98519938-06	.76927531-03	.29999999-02	.19734883 00	.19734982 00	.19460200 00	.27478207-02
DZ	-.49107156-05	.12746518-02	.29999999-02	-.37347038 00	-.37347529 00	-.37165186 00	-.18234327-02

DIFFERENCES

PERICYNTHION

```
TIME= 0. HRS
RAC -C.1C41375CE C4 VEL  0.6427CC2CE CC GAM -0.46890229E-C3 PSI -0.42675018E-01 RAS -C.764656C7E-C2
DEC -C.90575218E-C3 ALT -C.1C4132C3E C4 RCP -0.10388750E 04 SMA -0.63687500E 03 ECC  C.655725 6CE-C4
INC -C.21555501E-C1 M M  C.1C42366CE-C1 ASN  0.78243256E-C1 AOP -C.74637412E-C1 TAN -C.41677151E-C4
 DR  C.13063163E C4  DV  0.42479115E C1
```

ACQUISITION

```
TIME= 0.63333333E CC HRS
RAC -0.69375CCCE C2 VEL  0.2557373CE-C1 GAM  0.44074C59E-02 PSI -C.29945374E-C2 RAS  C.21118164E-01
DEC  C.34285545E-C1 ALT -0.69375000E 02 RCP -0.69050000E 03 SMA -0.41500000E 02 ECC  C.72881579E-04
INC -C.21219569E-C1 M M  0.67596579E-03 ASN  0.77419281E-01 AOP -0.23323059E-C1 TAN  C.28C43985E-C4
 DR  C.6C291183E C4  DV  0.78863913E CC
```

END OF TRACK

```
TIME= C.13CCCCCCE C1 HRS
RAC  C.27125CCCE C2 VEL -0.13C310C6E 00 GAM -0.28344393E-02 PSI  0.29551506E-C1 RAS  0.5865C97CE-02
DEC  C.22462845E-01 ALT  0.27125CCCE C2 RCP -0.38518750E 03 SMA -0.390500CCE 03 ECC  C.12442470E-04
INC -C.21395445E-C1 M M  0.64C48767E-02 ASN  0.76587677E-01 AOP -0.65717697E-C1 TAN  C.25968254E-03
 DR  C.451E1204E C4  DV  0.16SC5471E C1
```

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(d) Case 4: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.33056933 06	-.61806995 06	-.81055520 05	.80957454 09	-.57590882 09	-.15396613 08
Y	-.61806995 06	.12280368 07	.19617381 06	-.15432362 10	.10978157 10	.44669725 08
Z	-.81055520 05	.19617381 06	.47632308 05	-.21426485 09	.15447685 09	.14647592 08
DX	.80957454 09	-.15432362 10	-.21426485 09	.20203709 13	-.14155643 13	-.32850252 11
DY	-.57590882 09	.10978157 10	.15447685 09	-.14155643 13	.10099269 13	.32960633 11
DZ	-.15396613 08	.44669725 08	.14647592 08	-.32850252 11	.32960633 11	.92191701 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.97006461 00	.64595238 00	-.99062666 00	.99672987 00	.27889967 00
Y	.97006461 00	-.10000000 01	-.81111891 00	.97974072 00	-.98577721 00	-.41981860 00
Z	.64595238 00	-.81111891 00	-.10000000 01	.69069221 00	-.70431607 00	-.69898769 00
DX	-.99062666 00	.97974072 00	.69069221 00	-.10000000 01	.99098952 00	.24070064 00
DY	.99672987 00	-.98577721 00	-.70431607 00	.99098952 00	-.10000000 01	-.34158961 00
DZ	.27889967 00	-.41981860 00	-.69898769 00	.24070064 00	-.34158961 00	-.10000000 01

J INVERSE ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.15630816 00	-.14435660 00	.13647323 00	-.27495533-04	.18743739-03	-.24439136-04
Y	-.14435660 00	.20974292 00	-.21309338 00	.44598688-04	-.21556146-03	.10810518-04
Z	.13647323 00	-.21309338 00	.43727142 00	.15974415-03	.48617177-03	-.60328845-03
DX	-.27495533-04	.44598688-04	.15974415-03	.20284767-06	.21393574-06	-.55788935-06
DY	.18743739-03	-.21556146-03	.48617177-03	.21393574-06	.59178450-06	-.76840130-06
DZ	-.24439136-04	.10810518-04	-.60328845-03	-.55788935-06	-.76840130-06	.16247371-05

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(d) Case 4: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.15630816 00	-.14435660 00	.13647323 00	-.27495533-04	.18743739-03	-.24439136-04
Y	-.14435660 00	.20974292 00	-.21309338 00	.44598688-04	-.21556146-03	.10810518-04
Z	.13647323 00	-.21309338 00	.43727142 00	.15974415-03	.48617177-03	-.60328845-03
DX	-.27495533-04	.44598688-04	.15974415-03	.20284767-06	.21393574-06	-.55788935-06
DY	.18743739-03	-.21556146-03	.48617177-03	.21393574-06	.59178450-06	-.76840130-06
DZ	-.24439136-04	.10810518-04	-.60328845-03	-.55788935-06	-.76840130-06	.16247371-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.79726401 00	.52201274 00	-.15441387 00	.61628784 00	-.48495726-01
Y	-.79726401 00	.99999999 00	-.70364039 00	.21621878 00	-.61185099 00	.18518733-01
Z	.52201274 00	-.70364039 00	.10000000 01	.53636992 00	.95572380 00	-.71574432 00
DX	-.15441387 00	.21621878 00	.53636992 00	.10000000 01	.61747096 00	-.97178793 00
DY	.61628784 00	-.61185099 00	.95572380 00	.61747096 00	.99999999 00	-.78363666 00
DZ	-.48495726-01	.18518733-01	-.71574432 00	-.97178793 00	-.78363666 00	.10000000 01

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN Ẋ, Ẏ, Ż) - Continued

(d) Case 4: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3
171032	60	12	-.18991931 05 .100 00 -.0105
171132	60	12	-.19152739 05 .100 00 -.0193
171232	60	12	-.19293383 05 .100 00 -.0085
171332	60	12	-.19414755 05 .100 00 -.0117
171432	60	12	-.19517711 05 .100 00 -.0059
171532	60	12	-.19603075 05 .100 00 -.0083
171632	60	12	-.19671638 05 .100 00 -.0112
171732	60	12	-.19724156 05 .100 00 -.0022
171832	60	12	-.19761351 05 .100 00 .0015
171932	60	12	-.19783913 05 .100 00 -.0039
172032	60	12	-.19792500 05 .100 00 -.0002
172132	60	12	-.19787738 05 .100 00 .0042
172232	60	12	-.19770223 05 .100 00 -.0022
172332	60	12	-.19740524 05 .100 00 .0078
172432	60	12	-.19699180 05 .100 00 -.0029
172532	60	12	-.19646703 05 .100 00 .0027
172632	60	12	-.19583578 05 .100 00 .0034
172732	60	12	-.19510269 05 .100 00 .0022
172832	60	12	-.19427211 05 .100 00 .0024
172932	60	12	-.19334820 05 .100 00 -.0054
173032	60	12	-.19233489 05 .100 00 .0059
173132	60	12	-.19123592 05 .100 00 .0005
173232	60	12	-.19005481 05 .100 00 .0056
173332	60	12	-.18879489 05 .100 00 .0059
173432	60	12	-.18745936 05 .100 00 .0022
173532	60	12	-.18605119 05 .100 00 .0020
173632	60	12	-.18457322 05 .100 00 .0054
173732	60	12	-.18302815 05 .100 00 .0063
173832	60	12	-.18141851 05 .100 00 .0007
173932	60	12	-.17974670 05 .100 00 .0034
174032	60	12	-.17801499 05 .100 00 .0078
174132	60	12	-.17622555 05 .100 00 .0046
174232	60	12	-.17438036 05 .100 00 .0051
174332	60	12	-.17248142 05 .100 00 .0090
174432	60	12	-.17053049 05 .100 00 -.0012
174532	60	12	-.16852929 05 .100 00 .0044
174632	60	12	-.16647946 05 .100 00 .0039
174732	60	12	-.16438250 05 .100 00 -.0002
174832	60	12	-.16223986 05 .100 00 -.0040
174932	60	12	-.16005294 05 .100 00 .0028
175032	60	12	-.15782300 05 .100 00 -.0087

DATA STATISTICS STATION 12 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-175032	41	.627-02	.627-02	-.164-03	

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(d) Case 4: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
171031	60	12		-.16016079 05 .114 00	.0275
171131	60	12		-.16183795 05 .114 00	.0189
171231	60	12		-.16331470 05 .114 00	.0188
171331	60	12		-.16459998 05 .115 00	.0054
171431	60	12		-.16570238 05 .115 00	.0034
171531	60	12		-.16663017 05 .115 00	.0068
171631	60	12		-.16739127 05 .116 00	.0010
171731	60	12		-.16799324 05 .116 00	-.0022
171831	60	12		-.16844332 05 .117 00	.0061
171931	60	12		-.16874842 05 .118 00	.0078
172031	60	12		-.16891514 05 .118 00	-.0039
172131	60	12		-.16894972 05 .119 00	.0037
172231	60	12		-.16885814 05 .119 00	-.0120
172331	60	12		-.16864608 05 .120 00	-.0012
172431	60	12		-.16831893 05 .121 00	-.0083
172531	60	12		-.16788179 05 .122 00	.0032
172631	60	12		-.16733955 05 .123 00	.0034
172731	60	12		-.16669678 05 .123 00	.0017
172831	60	12		-.16595788 05 .124 00	-.0051
173231	60	12		-.16212051 05 .128 00	-.0088
173331	60	12		-.16095884 05 .129 00	-.0085
173431	60	12		-.15972283 05 .131 00	-.0179
173531	60	12		-.15841547 05 .132 00	-.0126
173631	60	12		-.15703958 05 .134 00	-.0184
173731	60	12		-.15559783 05 .135 00	-.0182
173831	60	12		-.15409275 05 .137 00	-.0265

DATA STATISTICS STATION 61 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.123-01	.123-01	-.139-02	.152-03

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(e) Case 5: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .54456 00    QSOS  .26351 01

  X    20570711225615262766763      Y    21367652045716002714141 4      Z    21255075143515752311226 3
 DX    60170533236354605457014 4   DY    17662435127014365710561 5     DZ    57757665001354434051227 3
000000 23443525422200000000000

 Q          CC          STDEVCC        APRIORI          OLD Q          NEW Q          NOMINAL Q        DQ(NOM)
                                       STDEVDQ

  X    .19484056-03   .35523029 00   .20000000 01    .28446380 02    .28446575 02    .28779165 02   -.33259010 00
  Y    .10422286-04   .42610124 00   .20000000 01    .17866296 04    .17866296 04    .17874292 04   -.79957581 00
  Z    .63565360-03   .65565728 00   .20000000 01    .72191169 03    .72191232 03    .72263366 03   -.72133636 00
 DX    .66383111-06   .37738053-03   .29999999-02   -.17711987 01   -.17711981 01   -.17728667 01    .16686171-02
 DY    .99166419-06   .71736716-03   .29999999-02    .19748718 00    .19748817 00    .19460200 00    .28861742-02
 DZ   -.18870140-05   .11021290-02   .29999999-02   -.37385374 00   -.37385563 00   -.37165186 00   -.22037737-02

                                                   DIFFERENCES

                                                  PERICYNTHION

    TIME= 0. HRS
 RAD -0.74337500E 03 VEL  0.48163570E 02 GAM -0.17030463E-02 PSI -0.29614449E-01 RAS -0.86746216E-02
 DEC -0.11492047E-02 ALT -0.74337500E 03 ROP -0.73562500E 03 SMA -0.33300000E 03 ECC  0.55465847E-04
 INC -0.35424947E-01 M M  0.54492950E-02 ASN  .50315857E-01 ACP -0.48444748E-01 TAN -0.13298774E-03
  DR  0.11649346E 04  DV  0.26541055E 01

                                                  ACQUISITION

    TIME= 0.83333333E 00 HRS
 RAD -0.8275 0000E 02 VEL  0.12111182E 02 GAM  0.35123825E-02 PSI -0.31118393E-02 RAS  0.13364792E-01
 DEC  0.22931145E-01 ALT -0.82781250E 02 ROP -0.38762500E 03 SMA  0.26275000E 03 ECC  0.62864274E-04
 INC -0.15031896E-01 M M -0.43158395E-02 ASN  0.49491882E-01 ACP -0.90703964E-02 TAN -0.74520707E-04
  DR  0.39771942E 04  DV  0.61361291E 00

                                                  END OF TRACK

    TIME= 0.16333333E 01 HRS
 RAD -0.84375000E 02 VEL -0.51269531E-01 GAM -0.36217570E-02 PSI  0.23632050E-01 RAS  0.17013550E-02
 DEC  0.86145421E-02 ALT -0.84312500E 02 ROP -0.32043750E 03 SMA -0.25762500E 03 ECC  0.13299286E-04
 INC -0.15246391E-01 M M  0.42268846E-02 ASN  0.48259735E-01 ACP -0.46923637E-01 TAN  0.16910397E-03
  DR  0.17983062E 04  DV  0.13759457E 01
```

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(e) Case 5: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.38195864 06	-.91309971 06	-.19330670 06	.11688357 10	-.71042289 09	.63627312 07
Y	-.91309971 06	.29227676 07	.84211171 06	-.36041989 10	.18701826 10	-.78339774 08
Z	-.19330670 06	.84211171 06	.29444766 06	-.99766594 09	.44863759 09	-.31268987 08
DX	.11688357 10	-.36041989 10	-.99766594 09	.45359823 13	-.23549909 13	.12078356 12
DY	-.71042289 09	.18701826 10	.44863759 09	-.23549909 13	.13621409 13	-.23307456 11
DZ	.63627312 07	-.78339774 08	-.31268987 08	.12078356 12	-.23307456 11	.19809159 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.86425383 00	.57645176 00	-.88805133 00	.98497724 00	-.73152775-01
Y	.86425383 00	-.10000000 01	-.90775438 00	.98986489 00	-.93729404 00	.32557581 00
Z	.57645176 00	-.90775438 00	-.10000000 01	.86326728 00	-.70840309 00	.40942711 00
DX	-.88805133 00	.98986489 00	.86326728 00	-.10000000 01	.94742001 00	-.40293885 00
DY	.98497724 00	-.93729404 00	-.70840309 00	.94742001 00	-.10000000 01	.14188969 00
DZ	-.73152775-01	.32557581 00	.40942711 00	-.40293885 00	.14188969 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.12904641 00	-.13945682 00	.12258325 00	-.39261656-04	.15081844-03	.17381487-04
Y	-.13945682 00	.18156227 00	-.21336826 00	.77527663-05	-.23661757-03	.10034265-03
Z	.12258325 00	-.21336826 00	.42988647 00	.14991403-03	.46469224-03	-.57192870-03
DX	-.39261656-04	.77527663-05	.14991403-03	.14241607-06	.15885364-06	-.40154274-06
DY	.15081844-03	-.23661757-03	.46469224-03	.15885364-06	.51461566-06	-.61376938-06
DZ	.17381487-04	.10034265-03	-.57192870-03	-.40154274-06	-.61376938-06	.12146883-05

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(e) Case 5: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.12904641 00	-.13945682 00	.12258325 00	-.39261696-04	.15081844-03	.17381487-04
Y	-.13945682 00	.18156227 00	-.21336826 00	.77527663-05	-.23661757-03	.10034265-03
Z	.12258325 00	-.21336826 00	.42988647 00	.14991403-03	.46469224-03	-.57192870-03
DX	-.39261696-04	.77527663-05	.14991403-03	.14241607-06	.15885364-06	-.40154274-06
DY	.15081844-03	-.23661757-03	.46469224-03	.15885364-06	.51461566-06	-.61376938-06
DZ	.17381487-04	.10034265-03	-.57192870-03	-.40154274-06	-.61376938-06	.12146883-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.91107471 00	.52045272 00	-.28961204 00	.58524808 00	.43901721-01
Y	-.91107471 00	.99999998 00	-.76373047 00	.48213026-01	-.77409220 00	.21366841 00
Z	.52045272 00	-.76373047 00	.10000000 01	.60587899 00	.98797745 00	-.79146658 00
DX	-.28961204 00	.48213026-01	.60587899 00	.99999999 00	.58678119 00	-.96542791 00
DY	.58524808 00	-.77409220 00	.98797745 00	.58678119 00	.10000000 01	-.77630305 00
DZ	.43901721-01	.21366841 00	-.79146658 00	-.96542791 00	-.77630305 00	.99999999 00

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(e) Case 5: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME HMS	TC	C	CC3				
171032	60	12	-.18991928	05	.100	00	-.0134
171132	60	12	-.19152737	05	.100	00	-.0212
171232	60	12	-.19293381	05	.100	00	-.0100
171332	60	12	-.19414753	05	.100	00	-.0132
171432	60	12	-.19517710	05	.100	00	-.0068
171532	60	12	-.19603074	05	.100	00	-.0088
171632	60	12	-.19671638	05	.100	00	-.0115
171732	60	12	-.19724156	05	.100	00	-.0024
171832	60	12	-.19761351	05	.100	00	.0007
171932	60	12	-.19783512	05	.100	00	-.0046
172032	60	12	-.19792499	05	.100	00	-.0007
172132	60	12	-.19787736	05	.100	00	.0032
172232	60	12	-.19770222	05	.100	00	-.0032
172332	60	12	-.19740522	05	.100	00	.0059
172432	60	12	-.19699178	05	.100	00	-.0056
172532	60	12	-.19646699	05	.100	00	-.0010
172632	60	12	-.19583574	05	.100	00	-.0007
172732	60	12	-.19510264	05	.100	00	-.0024
172832	60	12	-.19427205	05	.100	00	-.0029
172932	60	12	-.19334813	05	.100	00	-.0115
173032	60	12	-.19233462	05	.100	00	-.0012
173132	60	12	-.19123584	05	.100	00	-.0073
173232	60	12	-.19005472	05	.100	00	-.0032
173332	60	12	-.18879481	05	.100	00	-.0027
173432	60	12	-.18745926	05	.100	00	-.0076
173532	60	12	-.18605109	05	.100	00	-.0078
173632	60	12	-.18457312	05	.100	00	-.0044
173732	60	12	-.18302805	05	.100	00	-.0037
173832	60	12	-.18141841	05	.100	00	-.0090
173932	60	12	-.17974661	05	.100	00	-.0059
174032	60	12	-.17801491	05	.100	00	-.0010
174132	60	12	-.17622546	05	.100	00	-.0037
174232	60	12	-.17438031	05	.100	00	-.0022
174332	60	12	-.17248137	05	.100	00	.0037
174432	60	12	-.17053045	05	.100	00	-.0051
174532	60	12	-.16852927	05	.100	00	.0017
174632	60	12	-.16647946	05	.100	00	.0042
174732	60	12	-.16438252	05	.100	00	.0017
174832	60	12	-.16223992	05	.100	00	.0006
174932	60	12	-.16005302	05	.100	00	.0107
175032	60	12	-.15782311	05	.100	00	.0027
175132	60	12	-.15555140	05	.100	00	.0067
175232	60	12	-.15323904	05	.100	00	.0037
175332	60	12	-.15088708	05	.100	00	.0079
175432	60	12	-.14849657	05	.100	00	.0070
175532	60	12	-.14606844	05	.100	00	.0111
175632	60	12	-.14360360	05	.100	00	.0023
175732	60	12	-.14110290	05	.100	00	.0072
175832	60	12	-.13856713	05	.100	00	.0051
175932	60	12	-.13599703	05	.100	00	.0035
180032	60	12	-.13339331	05	.100	00	.0061
180132	60	12	-.13075661	05	.100	00	.0107
180232	60	12	-.12808756	05	.100	00	-.0026
180332	60	12	-.12538671	05	.100	00	.0046
180432	60	12	-.12265461	05	.100	00	-.0052
180532	60	12	-.11989176	05	.100	00	.0009
180632	60	12	-.11709861	05	.100	00	.0028
180732	60	12	-.11427560	05	.100	00	-.0061
180832	60	12	-.11142313	05	.100	00	-.0116
180932	60	12	-.10854157	05	.100	00	-.0015
181032	60	12	-.10563124	05	.100	00	-.0176

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-181032	61	.682-02	.708-02	-.188-02	.501-04

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(e) Case 5: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATICN NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2C4553C.C

TIME H M S	TC	C	CC3	C3	
171031	60	12		-.16016076 05 .114 00	.0248
171131	60	12		-.16183794 05 .114 00	.0179
171231	60	12		-.16331471 05 .114 00	.0198
171331	60	12		-.16460001 05 .115 00	.0078
171431	60	12		-.16570242 05 .115 00	.0073
171531	60	12		-.16663022 05 .115 00	.0122
171631	60	12		-.16739133 05 .116 00	.0068
171731	60	12		-.16799331 05 .116 00	.0049
171831	60	12		-.16844340 05 .117 00	.0137
171931	60	12		-.16874851 05 .118 00	.0166
172031	60	12		-.16891523 05 .118 00	.0046
172131	60	12		-.16894981 05 .119 00	.0129
172231	60	12		-.16885824 05 .119 00	-.0022
172331	60	12		-.16864618 05 .120 00	.0083
172431	60	12		-.16831902 05 .121 00	.0012
172531	60	12		-.16788189 05 .122 00	.0132
172631	60	12		-.16733964 05 .123 00	.0127
172731	60	12		-.16669687 05 .123 00	.0112
172831	60	12		-.16595757 05 .124 00	.0039
173231	60	12		-.16212060 05 .128 00	-.0001
173331	60	12		-.16095892 05 .129 00	-.0005
173431	60	12		-.15972252 05 .131 00	-.0094
173531	60	12		-.15841556 05 .132 00	-.0034
173631	60	12		-.15703967 05 .134 00	-.0089
173731	60	12		-.15559792 05 .135 00	-.0089
173831	60	12		-.15409285 05 .137 00	-.0165

DATA STATISTICS STATICN 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.586-02	.1[illegible]4-01	.577-02	.131-03

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(f) Case 6: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .10000 01    QSOS  .31683 01

  X   2057047500361520052366 71      Y   2136765422331605710106 13      Z   2125507323361576136120 67
 DX   6017053157265464522454 52      DY   1766242260611437023741 15      DZ   5775770063235440151406 01
000000 2344352542220000000000 00

C          DC          STDEVDC        APRIORI STDEVDQ        OLD Q          NEW Q          NOMINAL Q        DC(NCM)

 X   -.16929171-03   .15657003 00   .20000000 01   .28309746 02   .28309577 02   .28779165 02   -.46558733 00
 Y   -.21732877-03   .26105597 00   .20000000 01   .17867682 04   .17867680 04   .17874292 04   -.66120911 00
 Z    .80098744-03   .63906055 00   .20000000 01   .72185245 03   .72185326 03   .72263366 03   -.78041077 00
DX    .39442497-06   .28651083-03   .29999999-02  -.17711027 01  -.17711023 01  -.17728667 01    .17644167-02
DY    .62109648-06   .68625583-03   .29999999-02   .19740815 00   .19740877 00   .19460200 00    .28067678-02
DZ   -.12899546-05   .98989289-03   .29999999-02  -.37403437 00  -.37403567 00  -.37165186 00   -.23838095-02

                                                    DIFFERENCES
                                                    PERICYNTHION
   TIME= 0. HRS
 RAD -0.40156295E 03 VEL  0.26739502E 00 GAM -0.13382360E-02 PSI -0.23051262E-01 RAS -0.42123795E-02
 DEC -0.43141842E-02 ALT -0.40154688E 03 RDP -0.39543750E 03 SMA -0.13375000E 03 ECC  0.33292919E-04
 INC -0.14904737E-01 M M  0.21877289E-02 ASN  0.37933350E-01 AOP -0.33615112E-01 TAN -0.10347087E-03
  DR  0.75745889E 03  DV  0.22552913E 01
                                                    ACQUISITION
   TIME= 0.63333333E 00 HRS
 RAD  0.19000000E 02 VEL  0.56557617E-01 GAM  0.20840168E-02 PSI -0.51746368E-02 RAS  0.10835648E-01
 DEC  0.18939853E-01 ALT  0.18937500E 02 RDP -0.47750000E 02 SMA  0.46250000E 03 ECC  0.40762126E-04
 INC -0.14574051E-01 M M -0.75798035E-02 ASN  0.37105560E-01 AOP -0.29411316E-02 TAN -0.11447072E-03
  DR  0.32659864E 04  DV  0.71019494E 00
                                                    END OF TRACK
   TIME= 0.26333333E 01 HRS
 RAD -0.85800000E 03 VEL  0.30963135E 00 GAM -0.24821758E-02 PSI  0.15230583E-01 RAS  0.11363983E-01
 DEC -0.78210831E-02 ALT -0.85800000E 03 RDP -0.28318750E 03 SMA -0.22725000E 03 ECC  0.13742596E-04
 INC -0.14455080E-01 M M  0.37240982E-02 ASN  0.35232544E-01 AOP -0.26117325E-01 TAN  0.30314922E-03
  DR  0.25865446E 04  DV  0.11400775E 01
```

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(f) Case 6: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.71151914 06	-.44060963 07	-.14825160 07	.61759266 10	-.19087137 10	.74453642 09
Y	-.44060963 07	.51555573 08	.18969223 08	-.74360769 11	.17093043 11	-.11420634 11
Z	-.14825160 07	.18969223 08	.70527060 07	-.27379732 11	.61054153 10	-.42703765 10
DX	.61759266 10	-.74360769 11	-.27379732 11	.10755122 15	-.24401615 14	.16697074 14
DY	-.19087137 10	.17093043 11	.61054153 10	-.24401615 14	.62667952 13	-.34713846 13
DZ	.74453642 09	-.11420634 11	-.42703765 10	.16697074 14	-.34713846 13	.27403210 13

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.99999999 00	.72745484 00	.66180222 00	-.70599426 00	.90390907 00	-.53320220 00
Y	.72745484 00	-.10000000 01	-.99475697 00	.99857699 00	-.95091560 00	.96080406 00
Z	.66180222 00	-.99475697 00	-.10000000 01	.99413108 00	-.91836342 00	.97137645 00
DX	-.70599426 00	.99857699 00	.99413108 00	-.10000000 01	.93991407 00	-.97259489 00
DY	.90390907 00	-.95091560 00	-.91836342 00	.93991407 00	-.10000000 01	.83768215 00
DZ	-.53320220 00	.96080406 00	.97137645 00	-.97259489 00	.83768215 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.24514173-01	-.33985294-01	.75328452-01	.31747080-04	.87556262-04	-.11343427-03
Y	-.33985294-01	.68150219-01	-.16526369 00	-.73064041-04	-.17879655-03	.25441103-03
Z	.75328452-01	-.16526369 00	.40839839 00	.18248950-03	.43631017-03	-.63201584-03
DX	.31747080-04	-.73064041-04	.18248950-03	.82088459-07	.19382097-06	-.28339217-06
DY	.87556262-04	-.17879655-03	.43631017-03	.19382097-06	.47094707-06	-.67340825-06
DZ	-.11343427-03	.25441103-03	-.63201584-03	-.28339217-06	-.67340825-06	.97988796-06

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(f) Case 6: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.24514173-01	-.33985294-01	.75328452-01	.31747080-04	.87556262-04	-.11343427-03
Y	-.33985294-01	.68150219-01	-.16526369 00	-.73064041-04	-.17879655-03	.25441103-03
Z	.75328452-01	-.16526369 00	.40839839 00	.18248950-03	.43631017-03	-.63201584-03
DX	.31747080-04	-.73064041-04	.18248950-03	.82088459-07	.19382097-06	-.28339217-06
DY	.87556262-04	-.17879655-03	.43631017-03	.19382097-06	.47094707-06	-.67340825-06
DZ	-.11343427-03	.25441103-03	-.63201584-03	-.28339217-06	-.67340825-06	.97988796-06

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.99999999 00	-.83147418 00	.75284991 00	.70770801 00	.81487788 00	-.73189276 00
Y	-.83147418 00	.10000000 01	-.99060792 00	-.97685254 00	-.99802050 00	.98449634 00
Z	.75284991 00	-.99060792 00	.10000000 01	.99667791 00	.99487216 00	-.99907421 00
DX	.70770801 00	-.97685254 00	.99667791 00	.10000000 01	.98576562 00	-.99921418 00
DY	.81487788 00	-.99802050 00	.99487216 00	.98576562 00	.10000000 01	-.99129788 00
DZ	-.73189276 00	.98449634 00	-.99907421 00	-.99921418 00	-.99129788 00	.10000000 01

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(f) Case 6: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME HMS	TC	Q	CC3						
171032	60	12	-.18991939	05	.100	00	-.0022
171132	60	12	-.19152744	05	.100	00	-.0146
171232	60	12	-.19293383	05	.100	00	-.0083
171332	60	12	-.19414152	05	.100	00	-.0144
171432	60	12	-.19517706	05	.100	00	-.0105
171532	60	12	-.19603069	05	.100	00	-.0142
171632	60	12	-.19671632	05	.100	00	-.0178
171732	60	12	-.19724149	05	.100	00	-.0095
171832	60	12	-.19761343	05	.100	00	-.0068
171932	60	12	-.19783904	05	.100	00	-.0122
172032	60	12	-.19792492	05	.100	00	-.0083
172132	60	12	-.19787729	05	.100	00	-.0039
172232	60	12	-.19770215	05	.100	00	-.0095
172332	60	12	-.19740517	05	.100	00	.0002
172432	60	12	-.19699172	05	.100	00	-.0107
172532	60	12	-.19646695	05	.100	00	-.0046
172632	60	12	-.19583571	05	.100	00	-.0042
172732	60	12	-.19510261	05	.100	00	-.0054
172832	60	12	-.19427203	05	.100	00	-.0049
172932	60	12	-.19334812	05	.100	00	-.0129
173032	60	12	-.19233481	05	.100	00	-.0020
173132	60	12	-.19123584	05	.100	00	-.0073
173232	60	12	-.19005472	05	.100	00	-.0029
173332	60	12	-.18879482	05	.100	00	-.0017
173432	60	12	-.18745927	05	.100	00	-.0063
173532	60	12	-.18605111	05	.100	00	-.0059
173632	60	12	-.18457314	05	.100	00	-.0022
173732	60	12	-.18302807	05	.100	00	-.0012
173832	60	12	-.18141843	05	.100	00	-.0066
173932	60	12	-.17974663	05	.100	00	-.0037
174032	60	12	-.17801493	05	.100	00	.0010
174132	60	12	-.17622548	05	.100	00	-.0017
174232	60	12	-.17438033	05	.100	00	-.0002
174332	60	12	-.17248138	05	.100	00	.0051
174432	60	12	-.17053046	05	.100	00	-.0037
174532	60	12	-.16852928	05	.100	00	.0029
174632	60	12	-.16647947	05	.100	00	.0054
174732	60	12	-.16438253	05	.100	00	.0029
174832	60	12	-.16223993	05	.100	00	.0012
174932	60	12	-.16005303	05	.100	00	.0114
175032	60	12	-.15782311	05	.100	00	.0027
175132	60	12	-.15555139	05	.100	00	.0061
175232	60	12	-.15323903	05	.100	00	.0027
175332	60	12	-.15088707	05	.100	00	.0073
175432	60	12	-.14849656	05	.100	00	.0059
175532	60	12	-.14606843	05	.100	00	.0099
175632	60	12	-.14360359	05	.100	00	.0012
175732	60	12	-.14110290	05	.100	00	.0062
175832	60	12	-.13856712	05	.100	00	.0039
175932	60	12	-.13599703	05	.100	00	.0027
180032	60	12	-.13339230	05	.100	00	.0051
180132	60	12	-.13075661	05	.100	00	.0109
180232	60	12	-.12808756	05	.100	00	-.0022
180332	60	12	-.12538672	05	.100	00	.0055
180432	60	12	-.12265463	05	.100	00	-.0035
180532	60	12	-.11989179	05	.100	00	.0035
180632	60	12	-.11709865	05	.100	00	.0067
180732	60	12	-.11427566	05	.100	00	-.0007
180832	60	12	-.11142320	05	.100	00	-.0049
180932	60	12	-.10854165	05	.100	00	.0068
181032	60	12	-.10563134	05	.100	00	-.0073
181132	60	12	-.10269260	05	.100	00	.0018
181232	60	12	-.09972570	04	.100	00	-.0048
181332	60	12	-.09673091	04	.100	00	-.0005
181432	60	12	-.09370846	04	.100	00	-.0034
181532	60	12	-.09065857	04	.100	00	-.0092
181632	60	12	-.08758144	04	.100	00	.0028
181832	60	12	-.08134612	04	.100	00	-.0046
181932	60	12	-.07818820	04	.100	00	-.0043
182032	60	12	-.07500363	04	.100	00	-.0029
182132	60	12	-.07179245	04	.100	00	-.0088
182232	60	12	-.06855486	04	.100	00	-.0049
182332	60	12	-.06529083	04	.100	00	-.0087
182432	60	12	-.06200433	04	.100	00	-.0066
182532	60	12	-.05868372	04	.100	00	-.0111
182632	60	12	-.05534072	04	.100	00	-.0021
182732	60	12	-.05197146	04	.100	00	-.0118
182832	60	12	-.04857594	04	.100	00	-.0137
182932	60	12	-.04515415	04	.100	00	-.0093
183032	60	12	-.04170609	04	.100	00	-.0072
183132	60	12	-.03823174	04	.100	00	-.0093

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Continued

(f) Case 6: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

H M S						
183232	6C	12	-.34731C63	C4	.1CC CC	-.C020
183332	6C	12	-.31204C32	C4	.1CC CC	-.0134
184332	6C	12	.55257689	C3	.1CC CC	-.0C19
184432	6C	12	.93451219	C3	.1CC CC	-.0055
184532	6C	12	.13192543	C4	.1CC CC	-.0043
184632	6C	12	.17066241	C4	.1CC CC	.0009
184732	6C	12	.20966614	C4	.1CC CC	.0020
184832	6C	12	.24654253	C4	.1CC CC	.C08C
184932	6C	12	.28848521	C4	.1CC CC	-.0021
185C32	6C	12	.32829570	C4	.1CC CC	.C014
185132	6C	12	.36837329	C4	.1CC CC	.0087
185232	6C	12	.40871696	C4	.1CC CC	.0C54
185332	6C	12	.44932542	C4	.1CC CC	.0C41
185432	6C	12	.49C19720	C4	.1CC CC	.0114
185532	6C	12	.53133035	C4	.1CC CC	.0131
185632	6C	12	.57272252	C4	.1CC CC	.C081
185732	6C	12	.61437111	C4	.1CC CC	.C139
190332	6C	12	.86942682	C4	.1CC CC	-.0016
190432	6C	12	.91274656	C4	.1CC CC	.0137
190532	6C	12	.95627583	C4	.1CC CC	.0017
190632	6C	12	.10000163	C5	.1CC CC	-.0052
190732	6C	12	.10439461	C5	.1CC CC	-.0032
190832	6C	12	.10886579	C5	.1CC CC	-.0122
190932	6C	12	.11323386	C5	.1CC CC	-.0198
191032	6C	12	.11767742	C5	.1CC CC	-.0258

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171C32	8/14-191C32	106	.752-02	.787-02	-.231-02	.615-04

TABLE X.- NOMINAL CM CASES WITH P = (2KM; 3M/SEC) AND ΔS = (0.6KM; 2M/SEC, 3M/SEC, 3M/SEC IN $\dot{X}$, $\dot{Y}$, $\dot{Z}$) - Concluded

(f) Case 6: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATICN NUMEER 61 66/CE/14 ITERATICN NUMBER 4 PASS NUMBER 04/226

FREQUENCY2C4553C.C

TIME H M S	TC	Q	CC3	C3	
171031	6C	12	-.16C16CE9 05 .114 00		.0378
171131	6C	12	-.161838C3 05 .114 00		.0266
171231	6C	12	-.16331476 05 .114 00		.0248
171331	6C	12	-.16460CC2 05 .115 0C		.CC95
171431	6C	12	-.1657C242 05 .115 00		.0073
171531	6C	12	-.16663020 05 .115 00		.0105
171631	6C	12	-.16739131 05 .116 00		.0046
171731	6C	12	-.16799329 05 .116 00		.0027
171831	6C	12	-.16844338 05 .117 00		.0115
171931	6C	12	-.16874849 05 .118 00		.0142
172031	6C	12	-.16891521 05 .118 00		.0032
172131	6C	12	-.16895495C 05 .119 00		.0122
172231	60	12	-.16885824 05 .119 00		-.0024
172331	6C	12	-.16864619 05 .120 00		.0093
172431	6C	12	-.16831904 05 .121 00		.0029
172531	6C	12	-.16788192 05 .122 00		.0156
172631	6C	12	-.16733968 05 .123 00		.0164
172731	6C	12	-.16665652 05 .123 00		.0161
172831	60	12	-.16595802 05 .124 00		.0093
173231	6C	12	-.16212068 05 .128 00		.0084
173331	6C	12	-.16C95902 05 .129 00		.0090
173431	6C	12	-.15972302 05 .131 00		.0006
173531	6C	12	-.15841566 05 .132 00		.0068
173631	6C	12	-.157C3978 05 .134 00		.0013
173731	6C	12	-.155598C3 05 .135 00		.0021
173831	6C	12	-.15409296 05 .137 00		-.0054

DATA STATISTICS STATION 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.924-02	.135-01	.981-02	.182-03

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC)

(a) Case 7: 10-minute arc of 2- and 3-way tracking

ITERATION NUMBER 4 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .65000 00 QSOS .96657 01

X 2064204543671530314546 72 Y 2136757350441606636610 67 Z 2125533026131575174064 60
DX 6017055336605466236525 10 DY 1766350770311430347276 36 DZ 5775774203775440362171 47
OCOOOC 2344352542220000000000

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.93212812-02	.45287360 01	.90000000 01	.34082681 02	.34073360 02	.43179165 02	-.91058049 01
Y	.68755891-02	.25157650 01	.90000000 01	.17837202 04	.17837271 04	.18018292 04	-.18102081 02
Z	-.55174348-02	.36277680 01	.90000000 01	.72676634 03	.72676082 03	.73703367 03	-.10272842 02
DX	.76582417-05	.23364192-02	.12000000-01	-.17721928 01	-.17721851 01	-.17588667 01	-.13318350-01
DY	-.61491492-06	.33729566-02	.12000000-01	.20172090 00	.20172028 00	.20960200 00	-.78817140-02
DZ	-.14879393-04	.51856388-02	.12000000-01	-.37452830 00	-.37454319 00	-.36265186 00	-.11891328-01

DIFFERENCES

PERICYNTHION

TIME= . HRS
RAD -.92854875E 4 VEL .85 395[illegible]E 1 GAM - .[illegible]4375E-[illegible] PSI - .3649[illegible]44 E- 1 RAS - .[illegible]842[illegible]E [illegible]
DEC .16377211E ALT - .323664 6E 4 ROP - .2923[illegible] E 4 SMA .18461625E 05 ECC .173268 9E-02
INC .12175918E M M -.3[illegible]1351 8E ASN .6351[illegible]35E-1 A P - .96398528E-1 TAN - .68[illegible]67922E-02
DR .[illegible]E 2 DV .1419[illegible]37[illegible]E 2

ACQUISITION

TIME= .63333333E HRS
RAD .463375[illegible]E 3 VEL .4[illegible]E 1 GAM .89[illegible]4536E-[illegible] PSI .12505436E 00 RAS -0.41160583E-01
DEC -.[illegible]9E- 1 ALT .24[illegible]375E 3 ROP - .25[illegible]375E 04 SMA .19027875E 05 ECC 0.17419271E-02
INC .1221149 E M M -.311 8472E ASN .92641144E-01 A P .27971745E 0 TAN -0.4730[illegible]160E-02
DR .934[illegible]E 4 DV .14 242 6E 2

END OF TRACK

TIME= .3[illegible] E HRS
RAD .55185[illegible] E 4 VEL .2138[illegible]E 1 GAM .11538768E PSI .11355686E 00 RAS -0.50315857E-01
DEC - .6874775[illegible]E- 1 ALT .5518[illegible]312E 4 ROP - .23538[illegible]E 04 SMA .19[illegible]025[illegible]E 05 ECC 0.17143078E-02
INC .1[illegible]E M M - .31[illegible]E ASN .-24[illegible]E-01 A P .25970078E 00 TAN -0.61918944E-02
DR .1483423 E 5 DV .1356248 E 2

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(a) Case 7: 10-minute arc of 2- and 3-way tracking

J MATRIX — ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.21875255 06	-.42741697 06	-.68169271 05	.51031753 09	-.39337099 09	-.29301015 08
Y	-.42741697 06	.83522885 06	.13327832 06	-.99659974 09	.76873733 09	.57520327 08
Z	-.68169271 05	.13327832 06	.21321985 05	-.15854826 09	.12270436 09	.93823620 07
DX	.51031753 09	-.99659974 09	-.15854826 09	.11934885 13	-.91693835 12	-.66795249 11
DY	-.39337099 09	.76873733 09	.12270436 09	-.91693835 12	.70756878 12	.53080382 11
DZ	-.29301015 08	.57520327 08	.93823620 07	-.66795249 11	.53080382 11	.47409181 10

CORRELATIONS BASED ON J MATRIX — ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99993657 00	.99815568 00	-.99874544 00	.99986517 00	.90986063 00
Y	.99993657 00	-.10000000 01	-.99871817 00	.99818011 00	-.99997905 00	-.91408667 00
Z	.99815568 00	-.99871817 00	-.10000000 01	.99389054 00	-.99899160 00	-.93318368 00
DX	-.99874544 00	.99818011 00	.99389054 00	-.99999999 00	.99780733 00	.88798418 00
DY	.99986517 00	-.99997905 00	-.99899160 00	.99780733 00	-.10000000 01	-.91647050 00
DZ	.90986063 00	-.91408667 00	-.93318368 00	.88798418 00	-.91647050 00	-.10000000 01

J INVERSE — ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.20909450 02	-.10747408 02	.15536349 02	-.60230588-02	.12247280-01	.44237006-02
Y	-.10747408 02	.63290738 01	-.77076889 01	.45147124-02	-.52252621-02	-.58477620-02
Z	.15536349 02	-.77076889 01	.13160701 02	-.30132477-02	.10895883-01	-.95491019-03
DX	-.60230588-02	.45147124-02	-.30132477-02	.54588550-05	.17424231-06	-.11078306-04
DY	.12247280-01	-.52252621-02	.10895883-01	.17424231-06	.11377120-04	-.73985507-05
DZ	.44237006-02	-.58477620-02	-.95491019-03	-.11078306-04	-.73985507-05	.26932351-04

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(a) Case 7: 10-minute arc of 2- and 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.20509450 02	-.10747408 02	.15536349 02	-.60230586-02	.12247280-01	.44237006-02
Y	-.10747408 02	.63290738 01	-.77076889 01	.45147124-02	-.52252621-02	-.58477620-02
Z	.15536349 02	-.77076889 01	.13160701 02	-.30132477-02	.10895883-01	-.95491019-03
DX	-.60230586-02	.45147124-02	-.30132477-02	.54588550-05	.17424231-06	-.11078306-04
DY	.12247280-01	-.52252621-02	.10895883-01	.17424231-06	.11377120-04	-.73985507-05
DZ	.44237006-02	-.58477620-02	-.95491019-03	-.11078306-04	-.73985507-05	.26932351-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.99999997 00	-.94331478 00	.94565441 00	-.56923199 00	.80176386 00	.18822252 00
Y	-.94331478 00	.10000000 01	-.84452903 00	.76808491 00	-.61577468 00	-.44790145 00
Z	.94565441 00	-.84452903 00	.99999998 00	-.35550404 00	.89044427 00	-.50720774-01
DX	-.56923199 00	.76808491 00	-.35550404 00	.10000000 01	.22109895-01	-.91366179 00
DY	.80176386 00	-.61577468 00	.89044427 00	.22109895-01	.99999999 00	-.42266214 00
DZ	.18822252 00	-.44790145 00	-.50720774-01	-.91366179 00	-.42266214 00	.99999999 00

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(a) Case 7: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME H M S	TC	G	CC3				
171032	60	12	-.18991920	05	.100	00	-.0215
171132	60	12	-.19152762	05	.100	00	.0042
171232	60	12	-.19293420	05	.100	00	.0283
171332	60	12	-.19414788	05	.100	00	.0220
171432	60	12	-.19517733	05	.100	00	.0166
171532	60	12	-.19603082	05	.100	00	-.0012
171632	60	12	-.19671630	05	.100	00	-.0198
171732	60	12	-.19724137	05	.100	00	-.0212
171832	60	12	-.19761330	05	.100	00	-.0200
171932	60	12	-.19783903	05	.100	00	-.0137
172032	60	12	-.19792516	05	.100	00	.0164

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-172032	11	.184-01	.184-01	-.910-03	.340-03

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC AND ΔS = (15KM; 12M/SEC) - Continued

(a) Case 7: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME	TC	C	CC3	C3	
H M S					
171031	60	12		-.16016021 05 .114 00	-.0303
171131	60	12		-.16183777 05 .114 00	.0006
171231	60	12		-.16331472 05 .114 00	.0206
171331	60	12		-.16460004 05 .115 00	.0107
171431	60	12		-.16570238 05 .115 00	.0039
171531	60	12		-.16663009 05 .115 00	-.0010
171631	60	12		-.16739111 05 .116 00	-.0154
171731	60	12		-.16799304 05 .116 00	-.0222
171831	60	12		-.16844315 05 .117 00	-.0073
171931	60	12		-.16874848 05 .118 00	.0137
172031	60	12		-.16891554 05 .118 00	.0361

DATA STATISTICS STATION 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172031	11	.184-01	.185-01	.866-03	.341-03

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(b) Case 8: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .18797 00    QSOS  .11107 02

  X   20572133140515265033203 1      Y   21367642264616062470530 5      Z   21255126754415766105616 2
 DX   60170520526754642060450      DY   17662643070514374435264 5      DZ   57757757130654451331742 0
COOOOO 2344352542220000000000000

 Q          DQ          STDEVDQ        APRIORI          OLD Q          NEW Q          NOMINAL Q        DQ(NOM)
                                       STDEVDQ

 X    .65765994-02   .13739630 01   .90000000 01    .29082074 02    .29089051 02    .43179165 02   -.14090113 02
 Y   -.29560421-02   .84107387 00   .90000000 01    .17861500 04    .17861471 04    .18018292 04   -.15682129 02
 Z    .58681741-02   .11925606 01   .90000000 01    .72271169 03    .72271755 03    .73703367 03   -.14316109 02
DX    .19953656-05   .90018603-03   .12000000-01   -.17710390 01   -.17710370 01   -.17588667 01   -.12170270-01
DY    .93738815-05   .16946493-02   .12000000-01    .19850069 00    .19851006 00    .20960200 00   -.11091938-01
DZ   -.90934532-05   .25140156-02   .12000000-01   -.37473415 00   -.37474325 00   -.36265186 00   -.12091387-01


                                                                DIFFERENCES
                                                               PERICYNTHION
      TIME= 0. HRS
RAD -0.11891250E 04 VEL  0.92913818E 00 GAM -0.73522776E-02 PSI  0.79822540E-03 RAS -0.29524803E-01
DEC  0.26287317E-01 ALT -0.31891172E 04 RCP -0.11562500E 04 SMA  0.38487500E 03 ECC  0.15676767E-03
INC  0.22751093E-01 M M -0.62990189E-02 ASN -0.20751953E-02 AOP -0.15576363E-01 TAN -0.56566810E-03
 DR  0.43536030E 04  DV  0.30459446E 01                        ACQUISITION

      TIME= 0.63333333E 00 HRS
RAD -0.27125000E 03 VEL  0.36151123E 00 GAM  0.88632107E-02 PSI  0.20605087E-01 RAS -0.10583878E-01
DEC -0.11677980E-01 ALT -0.27137500E 03 RCP -0.80975000E 03 SMA  0.97825000E 03 ECC  0.16425523E-03
INC  0.23077726E-01 M M -0.16032219E-01 ASN -0.29144287E-02 AOP  0.18549919E-01 TAN -0.30167401E-03
 DR  0.23616671E 04  DV  0.20893641E 01                        END OF TRACK

      TIME= 0.66666666E 00 HRS
RAD  0.52862500E 03 VEL -0.14038066E-02 GAM  0.86743832E-02 PSI  0.12518883E-01 RAS -0.10885053E-01
DEC -0.19878149E-01 ALT  0.53856250E 03 ROP -0.45793750E 03 SMA  0.85550000E 03 ECC  0.11612847E-03
INC  0.22941589E-01 M M -0.14025688E-01 ASN -0.33111572E-02 AOP  0.11721611E-01 TAN -0.38066506E-03
 DR  0.39874493E 04  DV  0.13688000E 01
```

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(b) Case 8: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.30873017 06	-.58920438 06	-.84239928 05	.74803388 09	-.54352688 09	-.22263836 08
Y	-.58920438 06	.11258486 07	.16194525 06	-.14240938 10	.10383018 10	.44598791 08
Z	-.84239928 05	.16194525 06	.24019686 05	-.20095017 09	.14917763 09	.79519910 07
DX	.74803388 09	-.14240938 10	-.20095017 09	.18235964 13	-.13139731 13	-.47547562 11
DY	-.54352688 09	.10383018 10	.14917763 09	-.13139731 13	.95769864 12	.40915263 11
DZ	-.22263836 08	.44598791 08	.79519910 07	-.47547562 11	.40915263 11	.53073765 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99939334 00	.97823858 00	-.99693622 00	.99957885 00	.54997882 00
Y	.99939334 00	-.10000000 01	-.98479213 00	.99388070 00	-.99992901 00	-.57692399 00
Z	.97823858 00	-.98479213 00	-.10000000 01	.96015278 00	-.98357078 00	-.70425140 00
DX	-.99693622 00	.99388070 00	.96015278 00	-.10000000 01	.99427765 00	.48328064 00
DY	.99957885 00	-.99992901 00	-.98357078 00	.99427765 00	-.10000000 01	-.57386061 00
DZ	.54997882 00	-.57692399 00	-.70425140 00	.48328064 00	-.57386061 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.18877743 01	-.10212841 01	.11546336 01	-.16857071-03	.17907216-02	-.54398794-03
Y	-.10212841 01	.70740526 00	-.66535262 00	.24350300-03	-.90602788-03	-.65542960-04
Z	.11546336 01	-.66535262 00	.14222007 01	.52580686-03	.19690111-02	-.21647809-02
DX	-.16857071-03	.24350300-03	.52580686-03	.81033490-06	.76246726-06	-.21592562-05
DY	.17907216-02	-.90602788-03	.19690111-02	.76246726-06	.28718363-05	-.31330127-05
DZ	-.54398794-03	-.65542960-04	-.21647809-02	-.21592562-05	-.31330127-05	.63202744-05

TABLE VI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(b) Case 8: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.18677743 01	-.10212841 01	.11546336 01	-.16857071-03	.17907216-02	-.54398794-03
Y	-.10212841 01	.70740526 00	-.66535262 00	.24350300-03	-.90602788-03	-.65542960-04
Z	.11546336 01	-.66535262 00	.14222007 01	.52580686-03	.19690111-02	-.21647809-02
DX	-.16857071-03	.24350300-03	.52580686-03	.81033490-06	.76246726-06	-.21592562-05
DY	.17907216-02	-.90602788-03	.19690111-02	.76246726-06	.28718363-05	-.31330127-05
DZ	-.54398794-03	-.65542960-04	-.21647809-02	-.21592562-05	-.31330127-05	.63202744-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.88376626 00	.70467475 00	-.13629340 00	.76908299 00	-.15748757 00
Y	-.88376626 00	.10000000 01	-.66334166 00	.32161620 00	-.63566393 00	-.30997305-01
Z	.70467475 00	-.66334166 00	.99999999 00	.48979407 00	.97428518 00	-.72204711 00
DX	-.13629340 00	.32161620 00	.48979407 00	.10000000 01	.49981477 00	-.95412203 00
DY	.76908299 00	-.63566393 00	.97428518 00	.49981477 00	.10000000 01	-.73538427 00
DZ	-.15748757 00	-.30997305-01	-.72204711 00	-.95412203 00	-.73538427 00	.10000000 01

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(b) Case 8: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

STATICN NUMEER 12 66/C8/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2C4553C.C

TIME H M S	TC	C	CC3
171C32	6C 12	-.18991935 C5 .1CC CC	-.0C68
171132	6C 12	-.19152750 C5 .1CC CC	-.0078
171232	6C 12	-.19293398 C5 .1CC CC	.CC66
171332	6C 12	-.19414772 C5 .1CC 00	.CC56
171432	6C 12	-.19517729 C5 .1CC 00	.C12C
171532	6C 12	-.19603C91 C5 .1CC CC	.CC83
171632	6C 12	-.19671653 C5 .1CC 00	.0037
171732	6C 12	-.19724168 C5 .1CC CC	.CC98
171832	6C 12	-.19761359 C5 .1CC CC	.C090
171932	6C 12	-.19783917 C5 .1CC CC	.C002
172C32	60 12	-.19792CC C5 .1CC 00	-.CCCC
172132	6C 12	-.19767734 C5 .1CC 00	.0007
172232	60 12	-.19770217 C5 .1CC 00	-.0081
172332	6C 12	-.19740516 C5 .1CC CC	-.C002
172432	6C 12	-.19699170 C5 .1CC CC	-.0137
172532	6C 12	-.19646692 C5 .100 00	-.0C81
172632	6C 12	-.19583568 C5 .1CC CC	-.0068
172732	6C 12	-.19510261 C5 .1CC CC	-.0C59
172832	6C 12	-.19427206 C5 .1CC CC	-.0022
172932	6C 12	-.19334820 C5 .1CC CC	-.CC49
173C32	6C 12	-.19233496 C5 .100 00	.C129

DATA STATISTICS STATICN 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECCND MOMENT
04/226	CC3	8/14-171C32	8/14-173C32	21	.749-02	.750-02	.209-03	.562-04

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(b) Case 8: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
171031	60	12	-.16016042 05	.114 00	-.0093
171131	60	12	-.16183770 05	.114 00	-.0062
171231	60	12	-.16331453 05	.114 00	.0021
171331	60	12	-.16459987 05	.115 00	-.0056
171431	60	12	-.16570231 05	.115 00	-.0032
171531	60	12	-.16663013 05	.115 00	.0034
171631	60	12	-.16739125 05	.116 00	-.0012
171731	60	12	-.16799323 05	.116 00	-.0034
171831	60	12	-.16844331 05	.117 00	.0042
171931	60	12	-.16874840 05	.118 00	.0059
172031	60	12	-.16891512 05	.118 00	-.0063
172131	60	12	-.16894969 05	.119 00	.0010
172231	60	12	-.16885812 05	.119 00	-.0142
172331	60	12	-.16864606 05	.120 00	-.0032
172431	60	12	-.16831893 05	.121 00	-.0088
172531	60	12	-.16788182 05	.122 00	.0059
172631	60	12	-.16733961 05	.123 00	.0095
172731	60	12	-.16669689 05	.123 00	.0127
172831	60	12	-.16595805 05	.124 00	.0125

DATA STATISTICS STATION 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172831	19	.731-02	.732-02	-.231-03	.535-04

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(c) Case 9: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .27874 00    OSOS  .11441 02

  X   20571046114715261705601 3      Y   21367647111216042345144 4      Z   21255114311215764174371 2
 DX   60170527466754443022002 2     DY   17662541176714366544525 7     DZ   57757747256254437336373 3
000000 23443525422200000000000
```

C	CC	STDEVCQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.10485238-03	.38281738 00	.90000000 01	.28537361 02	.28537256 02	.43179165 02	-.14641909 02
Y	.83886341-04	.46580606 00	.90000000 01	.17864463 04	.17864464 04	.18018292 04	-.15382751 02
Z	-.11101536-02	.76507463 00	.90000000 01	.72238839 03	.72238728 03	.73703367 03	-.14646385 02
DX	-.90082633-06	.42315210-03	.12000000-01	-.17709712 01	-.17709721 01	-.17588667 01	-.12105420-01
DY	-.13953250-05	.84090564-03	.12000000-01	.19800756 00	.19800757 00	.20960200 00	-.11594431-01
DZ	.28175581-05	.12681036-02	.12000000-01	-.37462654 00	-.37462372 00	-.36265186 00	-.11971865-01

DIFFERENCES

PERICYNTHION

```
TIME= 0. HRS
RAD -0.71231250E 03 VEL  0.46191406E 00 GAM -0.16206205E-02 PSI -0.12254715E-02 RAS -0.11675835E-01
DEC  0.13947010E-01 ALT -0.71227344E 03 RCP -0.70481250E 03 SMA -0.30837500E 03 ECC  0.53972006E-04
INC  0.11266470E-01 M M  0.50449371E-02 ASN  0.62522888E-02 AOP -0.15695572E-01 TAN -0.12667198E-03
 DR  0.20744916E 04  DV  0.13779137E 01
```

ACQUISITION

```
TIME= 0.63333333E 00 HRS
RAD -0.64625000E 02 VEL  0.98510742E-01 GAM  0.34184456E-02 PSI  0.11909485E-01 RAS -0.46176910E-02
DEC -0.35684109E-02 ALT -0.64718750E 02 RCP -0.35762500E 03 SMA  0.28662500E 03 ECC  0.61392784E-04
INC  0.11593103E-01 M M -0.46987534E-02 ASN  0.54130554E-02 AOP  0.23012161E-02 TAN -0.76845288E-04
 DR  0.86610658E 03  DV  0.10681422E 01
```

END OF TRACK

```
TIME= 0.16333333E 01 HRS
RAD -0.69125000E 02 VEL -0.49102783E-01 GAM -0.35249591E-02 PSI -0.67806244E-03 RAS -0.25939941E-02
DEC -0.11900425E-01 ALT -0.69062500E 02 RCP -0.26987500E 03 SMA -0.23275000E 03 ECC  0.11850148E-04
INC  0.11436939E-01 M M  0.38188512E-02 ASN  0.41694641E-02 AOP -0.11551857E-01 TAN  0.16365298E-03
 DR  0.24904443E 04  DV  0.77130725E-01
```

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(c) Case 9: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.3816436C C6	-.9128C911 C6	-.19329241 C6	.11682374 1C	-.71045659 C9	.67148132 C7
Y	-.9128C911 C6	.292268C4 C7	.84238612 C6	-.36036419 1C	.18710864 1C	-.79516183 C8
Z	-.19329241 C6	.84238612 C6	.29469720 C6	-.99790375 C9	.44902568 C9	-.31632194 C8
DX	.11682374 1C	-.36036419 1C	-.99790375 C9	.45346409 13	-.23557376 13	.12225694 12
DY	-.71045659 C9	.18710864 1C	.44902568 C9	-.23557376 13	.13632748 13	-.24078451 11
DZ	.67148132 C7	-.79516183 C8	-.31632194 C8	.12225694 12	-.24078451 11	.19909366 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 C1	.86429165 00	.57636527 00	-.88803616 CC	.98495607 00	-.77032896-01
Y	.86429165 CC	-.10000000 01	-.90767951 00	.98987308 0C	-.93737092 C0	.32963714 00
Z	.57636527 0C	-.90767951 CC	-.99999999 00	.86323531 00	-.70842107 C0	.41296438 00
DX	-.88803616 CC	.98987308 00	.86323531 00	-.10000000 01	.94746628 C0	-.40688658 00
DY	.98495607 0C	-.93737092 CC	-.70842107 00	.94746628 00	-.99999999 CC	.14615313 00
DZ	-.77032896-01	.32963714 0C	.41296438 00	-.40688658 00	.14615313 00	-.99999999 00

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.14654915 0C	-.16443279 CC	.16141867 C0	-.31600489-04	.19390986-03	-.21128887-04
Y	-.16443279 0C	.22071774 C0	-.28496902 00	-.13860482-04	-.31539745-03	.18789296-03
Z	.16141867 CC	-.28496902 00	.59147580 0C	.21696153-03	.64102916-03	-.80986661-03
DX	-.31600489-04	-.13860482-04	.21696153-03	.17905770-06	.23132539-06	-.51975849-06
DY	.19390986-03	-.31539745-03	.64102916-03	.23132539-06	.70712902-06	-.87188483-06
DZ	-.21128887-04	.18789296-03	-.80986661-03	-.51975849-06	-.87188483-06	.16080872-05

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(c) Case 9: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.91427776 00	.54826891 00	-.19507681 00	.60236385 00	-.43524137-01
Y	-.91427776 00	.10000000 01	-.78869765 00	-.69720937-01	-.79834429 00	.31538214 00
Z	.54826891 00	-.78869765 00	.10000000 01	.66668048 00	.99119697 00	-.83040550 00
DX	-.19507681 00	-.69720937-01	.66668048 00	.99999999 00	.65009596 00	-.96861299 00
DY	.60236385 00	-.79834429 00	.99119697 00	.65009596 00	.99999998 00	-.81762655 00
DZ	-.43524137-01	.31538214 00	-.83040550 00	-.96861299 00	-.81762655 00	.10000000 01

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.14654515 00	-.16443279 00	.16141867 00	-.31600489-04	.19390986-03	-.21128887-04
Y	-.16443279 00	.22071774 00	-.28496902 00	-.13860482-04	-.31539745-03	.18789296-03
Z	.16141867 00	-.28496902 00	.59147580 00	.21696153-03	.64102916-03	-.80986661-03
DX	-.31600489-04	-.13860482-04	.21696153-03	.17905770-06	.23132539-06	-.51975849-06
DY	.19390986-03	-.31539745-03	.64102916-03	.23132539-06	.70712902-06	-.87188483-06
DZ	-.21128887-04	.18789296-03	-.80986661-03	-.51975849-06	-.87188483-06	.16080872-05

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(c) Case 9: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME H M S	TC	G	CC3					
171032	60	12	-.18991543	05	.100	00		.0010
171132	60	12	-.19152750	05	.100	00		-.0081
171232	60	12	-.19293393	05	.100	00		.0015
171332	60	12	-.19414764	05	.100	00		-.0027
171432	60	12	-.19517719	05	.100	00		.0024
171532	60	12	-.19603082	05	.100	00		-.0010
171632	60	12	-.19671646	05	.100	00		-.0042
171732	60	12	-.19724162	05	.100	00		.0037
171832	60	12	-.19761356	05	.100	00		.0061
171932	60	12	-.19783917	05	.100	00		.0005
172032	60	12	-.19792503	05	.100	00		.0032
172132	60	12	-.19787740	05	.100	00		.0063
172232	60	12	-.19770225	05	.100	00		-.0002
172332	60	12	-.19740525	05	.100	00		.0085
172432	60	12	-.19695180	05	.100	00		-.0037
172532	60	12	-.19646701	05	.100	00		.0007
172632	60	12	-.19583575	05	.100	00		.0002
172732	60	12	-.19510265	05	.100	00		-.0017
172832	60	12	-.19427205	05	.100	00		-.0029
172932	60	12	-.19334814	05	.100	00		-.0112
173032	60	12	-.19233482	05	.100	00		-.0012
173132	60	12	-.19123584	05	.100	00		-.0078
173232	60	12	-.19005471	05	.100	00		-.0042
173332	60	12	-.18879479	05	.100	00		-.0039
173432	60	12	-.18745924	05	.100	00		-.0093
173532	60	12	-.18605107	05	.100	00		-.0095
173632	60	12	-.18457310	05	.100	00		-.0061
173732	60	12	-.18302803	05	.100	00		-.0054
173832	60	12	-.18141839	05	.100	00		-.0112
173932	60	12	-.17974658	05	.100	00		-.0083
174032	60	12	-.17801488	05	.100	00		-.0034
174132	60	12	-.17622544	05	.100	00		-.0059
174232	60	12	-.17438028	05	.100	00		-.0049
174332	60	12	-.17248134	05	.100	00		.0005
174432	60	12	-.17053042	05	.100	00		-.0078
174532	60	12	-.16852924	05	.100	00		-.0010
174632	60	12	-.16647942	05	.100	00		.0007
174732	60	12	-.16438245	05	.100	00		-.0007
174832	60	12	-.16223950	05	.100	00		-.0018
174932	60	12	-.16005300	05	.100	00		.0088
175032	60	12	-.15782309	05	.100	00		.0006
175132	60	12	-.15555137	05	.100	00		.0043
175232	60	12	-.15323901	05	.100	00		.0013
175332	60	12	-.15088706	05	.100	00		.0062
175432	60	12	-.14849655	05	.100	00		.0050
175532	60	12	-.14606843	05	.100	00		.0094
175632	60	12	-.14360359	05	.100	00		.0012
175732	60	12	-.14110290	05	.100	00		.0067
175832	60	12	-.13856713	05	.100	00		.0050
175932	60	12	-.13599704	05	.100	00		.0037
180032	60	12	-.13339331	05	.100	00		.0065
180132	60	12	-.13075662	05	.100	00		.0123
180232	60	12	-.12808757	05	.100	00		-.0009
180332	60	12	-.12538673	05	.100	00		.0066
180432	60	12	-.12265464	05	.100	00		-.0023
180532	60	12	-.11989179	05	.100	00		.0044
180632	60	12	-.11709865	05	.100	00		.0073
180732	60	12	-.11427566	05	.100	00		-.0011
180832	60	12	-.11142319	05	.100	00		-.0059
180932	60	12	-.10854163	05	.100	00		.0049
181032	60	12	-.10563132	05	.100	00		-.0100

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(c) Case 9: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

DATA STATISTICS — STATION 12 — ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-181032	61	.558-02	.559-02	-.304-03	.312-04

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME H M S	TC	C	CC3	C3
171031	60	12		-.16016054 05 .114 00 .0028
171131	60	12		-.16183773 05 .114 00 -.0028
171231	60	12		-.16331451 05 .114 00 -.0000
171331	60	12		-.16455982 05 .115 00 -.0112
171431	60	12		-.16570224 05 .115 00 -.0100
171531	60	12		-.16663006 05 .115 00 -.0042
171631	60	12		-.16739118 05 .116 00 -.0081
171731	60	12		-.16799317 05 .116 00 -.0090
171831	60	12		-.16844328 05 .117 00 .0015
171931	60	12		-.16874840 05 .118 00 .0059
172031	60	12		-.16891513 05 .118 00 -.0046
172131	60	12		-.16894974 05 .119 00 .0056
172231	60	12		-.16885818 05 .119 00 -.0083
172331	60	12		-.16864613 05 .120 00 .0034
172431	60	12		-.16831899 05 .121 00 -.0024
172531	60	12		-.16788187 05 .122 00 .0110
172631	60	12		-.16733964 05 .123 00 .0125
172731	60	12		-.16669689 05 .123 00 .0125
172831	60	12		-.16595799 05 .124 00 .0063
173231	60	12		-.16212067 05 .128 00 .0078
173331	60	12		-.16095902 05 .129 00 .0090
173431	60	12		-.15972302 05 .131 00 .0011
173531	60	12		-.15841568 05 .132 00 .0079
173631	60	12		-.15703960 05 .134 00 .0042
173731	60	12		-.15559807 05 .135 00 .0057
173831	60	12		-.15409300 05 .137 00 -.0009

DATA STATISTICS — STATION 61 — ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.697-02	.710-02	.137-02	.504-04

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(d) Case 10: 10-minute arc of 2-way tracking

ITERATION NUMBER 3 EPOCH 66/08/14 163152.013 CLOCK L25140 SCS .99492 00 GSOS .86810 01

X	2064567271151532456511 73	Y	21367666077516012666451 3	Z	21255260116715753756743 2
DX	60170520061754622012045 6	DY	17663662163114313010213 3	DZ	57760376330454417354062 7
CCCCCC	23443525422200000000000				

C	CC	STDEVCC	APRIORI STDEVDQ	CLC Q	NEW C	NOMINAL C	CC(NOM)
X	.77354316-02	.61358213 01	.90000000 01	.37857291 02	.37865027 02	.43179165 02	-.53141379 01
Y	-.13695428-02	.62820882 01	.90000000 01	.17873841 04	.17873828 04	.18018292 04	-.14446426 02
Z	.16061857-02	.62559990 01	.90000000 01	.72550321 03	.72550481 03	.73703367 03	-.11528854 02
DX	-.97473159-06	.41567002-02	.12000000-01	-.17705128 01	-.17705137 01	-.17588667 01	-.11647060-01
DY	.40171339-05	.55129062-02	.12000000-01	.20252760 00	.20253162 00	.20960200 00	-.70703755-02
DZ	.10612548-05	.10198066-01	.12000000-01	-.37888325 00	-.37888218 00	-.36265186 00	-.16230326-01

DIFFERENCES

PERICYNTHION

TIME= . HRS

RAD	.31843758 4	VEL	.36295169E 1	GAM	-.14[illegible]4571E [illegible]	PSI	-.26116371E-01	RAS	-.23372841E [illegible]		
DEC	.[illegible]	ALT	.3[illegible]8E 4	ROP	.[illegible]E 4	SMA	.33[illegible]625E 5	ECC	.21453[illegible]E-2		
INC	.[illegible]	M M	-.541763 75	ASN	-.11[illegible]333E [illegible]	A P	.16924667E [illegible]	TAN	-.1130[illegible]415E- 1		
DR	.251[illegible]2427E 5	DV	.108532.4E 2								

ACQUISITION

TIME= .[illegible] HRS

RAD	.785125[illegible]E 3	VEL	.7331[illegible]7495E 1	GAM	.1[illegible]96[illegible]25E [illegible]	PSI	.1887455[illegible]E-1	RAS	-.52848816E-1		
DEC	-.47[illegible]1753E- 1	ALT	.785[illegible]625[illegible]E 3	ROP	.39[illegible]9375E 04	SMA	.33824375E 05	ECC	.21572337E-2		
INC	.41[illegible]E- [illegible]	M M	-.55[illegible]E [illegible]	ASN	-.[illegible]E [illegible]	A P	.6[illegible]2377[illegible]E [illegible]	TAN	-.88643094E-2		
DR	.136217968E 5	DV	.12956613E 2								

END OF TRACK

TIME= .[illegible] HRS

RAD	.7422[illegible]E 4	VEL	.5[illegible]5[illegible]	GAM	.15 93[illegible]5E [illegible]	PSI	.2[illegible]975342E-[illegible]2	RAS	-.45[illegible]42038E-1		
DEC	-.524 1781E- 1	ALT	.7422125 [illegible]	ROP	.41473125E 04	SMA	.33791875E 05	ECC	.21293[illegible]14E-2		
INC	.4149 78 E- 1	M M	-.55145359E [illegible]	ASN	-.1116333[illegible]E [illegible]	A P	.564[illegible]2[illegible]2E [illegible]	TAN	-.1141[illegible]832E-1		
DR	.[illegible]3743745E 5	DV	.3[illegible]8[illegible]E [illegible]								

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(d) Case 10: 10-minute arc of 2-way tracking

J MATRIX — ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.12310545 06	-.24287305 06	-.37548109 05	.28943088 09	-.22373744 09	-.15640609 08
Y	-.24287305 06	.47921052 06	.74125300 05	-.57072350 09	.44147994 09	.31010724 08
Z	-.37548109 05	.74125300 05	.11497437 05	-.88003615 08	.68308989 08	.49158165 07
DX	.28943088 09	-.57072350 09	-.88003615 08	.68218040 12	-.52560399 12	-.35871135 11
DY	-.22373744 09	.44147994 09	.68308989 08	-.52560399 12	.40673484 12	.28648392 11
DZ	-.15640609 08	.31010724 08	.49158165 07	-.35871135 11	.28648392 11	.24634822 10

CORRELATIONS BASED ON J MATRIX — ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99994805 00	.99804202 00	-.99874940 00	.99987171 00	.89813215 00
Y	.99994805 00	-.10000000 01	-.99862577 00	.99818943 00	-.99998187 00	-.90255572 00
Z	.99804202 00	-.99862577 00	-.10000000 01	.99368874 00	-.99889916 00	-.92367762 00
DX	-.99874940 00	.99818943 00	.99368874 00	-.10000000 01	.99782265 00	.87502567 00
DY	.99987171 00	-.99998187 00	-.99889916 00	.99782265 00	-.10000000 01	-.90504434 00
DZ	.89813215 00	-.90255572 00	-.92367762 00	.87502567 00	-.90504434 00	-.10000000 01

J INVERSE — ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.37648303 02	.62448803 01	.48459689 01	-.28665246-02	.55926551-02	-.25481799-02
Y	.62448803 01	.39464632 02	-.32282033 02	.13792199-01	-.14595609-01	-.22154793-01
Z	.48459689 01	-.32282033 02	.39639604 02	-.21971863-02	.28988085-01	-.11063812-01
DX	-.28665246-02	.13792199-01	-.21971863-02	.17278157-04	.90145177-05	-.40675614-04
DY	.55926551-02	-.14595609-01	.28988085-01	.90145177-05	.30392135-04	-.35384683-04
DZ	-.25481799-02	-.22154793-01	-.11063812-01	-.40675614-04	-.35384683-04	.10400056-03

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(d) Case 10: 10-minute arc of 2-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.37648303 02	.62448803 01	.48455669 01	-.28665246-02	.55926551-02	-.25481799-02
Y	.62448803 01	.39464632 02	-.32282033 02	.13792199-01	-.14595609-01	-.22154793-01
Z	.48455669 01	-.32282033 02	.39639604 02	-.21971863-02	.28988085-01	-.11063812-01
DX	-.28665246-02	.13792199-01	-.21971863-02	.17278157-04	.90145177-05	-.40675614-04
DY	.55926551-02	-.14595609-01	.28988085-01	.90145177-05	.30392135-04	-.35384683-04
DZ	-.25481799-02	-.22154793-01	-.11063812-01	-.40675614-04	-.35384683-04	.10400056-03

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.10000000 01	.16201207 00	.12544209 00	-.11239170 00	.28358648 00	-.40722980-01
Y	.16201207 00	.10000000 01	-.81619172 00	.52817859 00	-.42144178 00	-.34581659 00
Z	.12544209 00	-.81619172 00	.10000000 01	-.83956342-01	.83516882 00	-.17231469 00
DX	-.11239170 00	.52817859 00	-.83956342-01	.10000000 01	.39338083 00	-.95954993 00
DY	.28358648 00	-.42144178 00	.83516882 00	.39338083 00	.10000000 01	-.62938569 00
DZ	-.40722980-01	-.34581659 00	-.17231469 00	-.95954993 00	-.62938569 00	.10000000 01

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(d) Case 10: 10-minute arc of 2-way tracking

STATICN NUMBER 12 66/C8/14 ITERATICN NLMBER 3 PASS NUMBER C4/226

FREQUENCY2C4553C.C

TIME H M S	TC	C	CC3				
171032	6C	12	-.18991899	C5	.1CC	CC	-.0425
171132	6C	12	-.19152762	C5	.1CC	CC	.CC34
171232	6C	12	-.19293427	C5	.1CC	CC	.0359
171332	6C	12	-.19414797	C5	.1CC	CC	.0305
171432	6C	12	-.19517736	C5	.1CC	CC	.C193
171532	6C	12	-.19603677	C5	.1CC	CC	-.CC63
171632	6C	12	-.19671617	C5	.1CC	CC	-.C325
171732	6C	12	-.19724122	C5	.1CC	CC	-.C364
171832	6C	12	-.19761319	C5	.1CC	CC	-.0310
171932	6C	12	-.19783905	C5	.1CC	CC	-.C120
172032	6C	12	-.19792546	C5	.1CC	CC	.C457

CATA STATISTICS STATICN 12 ITERATION 3

PASS	CATA TYPE	BEGINNING TIME	END TIME	NLMBER CF POINTS	STC CEV	RMS	FIRST MOMENT	SECCND MOMENT
04/226	CC3	6/14-171C32	6/14-172C32	11	.301-01	.302-01	-.235-02	.910-03

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued
(e) Case 11: 10-minute arc of 2- and 3-way tracking; solve for 3-way bias

ITERATION NUMBER 2 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .12106 01 QSOS .95715 01

X 2064336011361535754642 1 Y 2136765402131607074354 2 Z 2125521330771571272207 71
DX 6017053707245461504024 5 DY 1766227727041435411245 27 DZ 5776005760035445621675 11
OOOOOO 2344352542222222222222

C	DC	STDEVDQ	APRIORI STDEVDQ	OLD C	NEW Q	NOMINAL Q	DQ(NOM)
X	-.66634417-02	.52346627 01	.90000000 01	.35475702 02	.35469039 02	.43179165 02	-.77101259 01
Y	.90968595-03	.62271564 01	.90000000 01	.17867512 04	.17867521 04	.18018292 04	-.15077072 02
Z	.10170685-01	.58105141 01	.90000000 01	.72434577 03	.72435594 03	.73703367 03	-.12677719 02
DX	.16645410-04	.27310713-02	.12000000-01	-.17714470 01	-.17714303 01	-.17588667 01	-.12563616-01
DY	.17726295-04	.35176828-02	.12000000-01	.20066095 00	.20067871 00	.20960200 00	-.89232846-02
DZ	-.42353246-04	.56308283-02	.12000000-01	-.37568627 00	-.37572862 00	-.36265186 00	-.13076760-01

DIFFERENCES

PERICYNTHION

TIME= [illegible] HRS
RAD [illegible] VEL .3521[illegible]75E 1 GAM - .2[illegible]5 26E [illegible] PSI .62542915E-01 RAS -[illegible].31[illegible]56E [illegible]
DEC .8742[illegible]24E- 1 ALT .65 1[illegible]32E 4 RDP .7237[illegible] E 4 SMA .4711[illegible]75 E 5 ECC [illegible].27988[illegible]32E- 2
INC .1 4[illegible]3E [illegible] M M - .76[illegible] ASN - .[illegible]3E [illegible] A P .41276[illegible]E [illegible] TAN -[illegible].15[illegible]73E-[illegible]
DR [illegible] DV [illegible]

ACQUISITION

TIME= .63333[illegible]E HRS
RAD [illegible] VEL [illegible] GAM [illegible] PSI .3[illegible]335[illegible]3E- 1 RAS - .12574332E [illegible]
DEC - .1462[illegible]29E ALT .1256[illegible] 4 RDP .7948129 E 4 SMA .4767[illegible] E 5 ECC [illegible].281291 8E- 2
INC .1 51356[illegible]E M M -[illegible].7763[illegible]721E ASN -[illegible].3413[illegible]9E [illegible] A P .5 2456[illegible]4E [illegible] TAN -[illegible].1250[illegible]147E-[illegible]
DR [illegible] DV [illegible]

END OF TRACK

TIME= .8 E HRS
RAD .1[illegible] 1[illegible]124E 5 VEL .723[illegible]2E 1 GAM .1[illegible]15544E [illegible] PSI - .14545948E-[illegible] RAS -[illegible].106697[illegible]9E [illegible]
DEC - .15[illegible] [illegible] ALT [illegible] 5 RDP .77[illegible]5E 4 SMA .47[illegible]6E 5 ECC [illegible].2784[illegible]3E-[illegible]2
INC .1 5 556[illegible] M M -[illegible].7759[illegible]716E ASN - .34157181E [illegible] A P .85763931E [illegible] TAN - .16[illegible]6521[illegible]E-[illegible]1
DR .31554851E 5 DV [illegible].1939[illegible]24E 2

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(e) Case 11: 10-minute arc of 2- and 3-way tracking; solve for 3-way bias

J MATRIX — ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ	DS(13)
X	.21760525 06	-.42601974 06	-.66618764 05	.50852365 09	-.39257350 09	-.28446891 08	-.20111140 14
Y	-.42601974 06	.83415251 06	.13050799 06	-.99506607 09	.76870304 09	.55963532 08	.39148691 14
Z	-.66618764 05	.13050799 06	.20474241 05	-.15519993 09	.12030423 09	.89617260 07	.61379188 13
DX	.50852365 09	-.99506607 09	-.15519993 09	.11913567 13	-.91666992 12	-.64917869 11	-.46954640 17
DY	-.39257350 09	.76870304 09	.12030423 09	-.91666992 12	.70841821 12	.51711053 11	.36153591 17
DZ	-.28446891 08	.55963532 08	.89617260 07	-.64917869 11	.51711053 11	.45376036 10	.25625708 16
DS(13)	-.20111140 14	.39148691 14	.61379188 13	-.46954640 17	.36153591 17	.25625708 16	.43442680 22

CORRELATIONS BASED ON J MATRIX — ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ	DS(13)
X	-.10000000 01	.99993600 00	.99806285 00	-.99874697 00	.99986494 00	.90528797 00	.65409918 00
Y	.99993600 00	-.99999999 00	-.99864344 00	.99817867 00	-.99997931 00	-.90963907 00	-.65033362 00
Z	.99806285 00	-.99864344 00	-.10000000 01	.99372617 00	-.99892329 00	-.92976776 00	-.65081707 00
DX	-.99874697 00	.99817867 00	.99372617 00	-.10000000 01	.99780855 00	.88293774 00	.65267850 00
DY	.99986494 00	-.99997931 00	-.99892329 00	.99780855 00	-.10000000 01	-.91206386 00	-.65170083 00
DZ	.90528797 00	-.90963907 00	-.92976776 00	.88293774 00	-.91206386 00	-.10000000 01	-.57717073 00
DS(13)	.65409918 00	-.65033362 00	-.65081707 00	.65267850 00	-.65170083 00	-.57717073 00	-.10000000 01

J INVERSE — ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ	DS(13)
X	.27401694 02	.41845234 01	.36527950 01	-.23399938-02	.70560508-02	-.13637283-02	.77335169-09
Y	.41845234 01	.38777478 02	-.33538859 02	.12536794-01	-.16589589-01	-.18312090-01	.16773257-08
Z	.36527950 01	-.33538859 02	.33762074 02	-.93730582-02	.19974334-01	.88917687-02	-.13357424-08
DX	-.23399938-02	.12536794-01	-.93730582-02	.74587505-05	-.26439170-05	-.14171437-04	.41373744-12
DY	.70560508-02	-.16589589-01	.19974334-01	-.26439170-05	.15348239-04	-.30142208-05	-.58672066-12
DZ	-.13637283-02	-.18312090-01	.88917687-02	-.14171437-04	-.30142208-05	.31706228-04	-.64407118-12
DS(13)	.77335169-09	.16773257-08	-.13357424-08	.41373744-12	-.58672066-12	-.64407118-12	.86777769-19

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(e) Case 11: 10-minute arc of 2- and 3-way tracking; solve for 3-way bias

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ	DS(13)
X	.27401694 02	.41845234 01	.36527950 01	-.23399938-02	.70560508-02	-.13637283-02	.77335169-09
Y	.41845234 01	.38777478 02	-.33538659 02	.12536794-01	-.16589589-01	-.18312090-01	.16773257-08
Z	.36527950 01	-.33538659 02	.33762074 02	-.93730582-02	.19974334-01	.88917687-02	-.13357424-08
DX	-.23399938-02	.12536794-01	-.93730582-02	.74587505-05	-.26439170-05	-.14171437-04	.41373744-12
DY	.70560508-02	-.16589589-01	.19974334-01	-.26439170-05	.15348239-04	-.30142208-05	-.58672066-12
DZ	-.13637283-02	-.18312090-01	.88917687-02	-.14171437-04	-.30142208-05	.31706228-04	-.64407118-12
DS(13)	.77335169-09	.16773257-08	-.13357424-08	.41373744-12	-.58672066-12	-.64407118-12	.86777769-19

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ	DS(13)
X	.99999999 00	.12837117 00	.12009420 00	-.16367900 00	.34406755 00	-.46266521-01	.50151519 00
Y	.12837117 00	.10000000 01	-.92692362 00	.73716326 00	-.68001200 00	-.52224685 00	.91437300 00
Z	.12009420 00	-.92692362 00	.10000000 01	-.59065478 00	.87746231 00	.27176987 00	-.78037603 00
DX	-.16367900 00	.73716326 00	-.59065478 00	.10000000 01	-.24710726 00	-.92152806 00	.51426569 00
DY	.34406755 00	-.68001200 00	.87746231 00	-.24710726 00	.10000000 01	-.13663863 00	-.50839102 00
DZ	-.46266521-01	-.52224685 00	.27176987 00	-.92152806 00	-.13663863 00	.10000000 01	-.38829101 00
DS(13)	.50151519 00	.91437300 00	-.78037603 00	.51426569 00	-.50839102 00	-.38829101 00	.10000000 01

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

(e) Case 11: 10-minute arc of 2- and 3-way tracking; solve for 3-way bias

STATION NUMBER 12 66/CE/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2C4553C.0

TIME HMS	TC	C	CC3				
171C32	6C	12	-.18991903	C5	.1CC	CO	-.C381
171132	6C	12	-.19152755	C5	.1CC	CO	-.C034
171232	6C	12	-.19293416	C5	.1CC	CC	.C242
171332	6C	12	-.19414785	C5	.1CC	CO	.C186
171432	6C	12	-.19517727	C5	.1CC	CC	.0105
171532	6C	12	-.196C3C72	C5	.1CC	OC	-.0107
171632	6C	12	-.19671617	C5	.1CC	CO	-.C327
171732	6C	12	-.19724122	C5	.100	CC	-.0364
171832	6C	12	-.19761316	C5	.1CC	CC	-.0342
171932	6C	12	-.19783892	C5	.1CC	CC	-.C242
172C32	6C	12	-.19792517	C5	.100	00	.C168

DATA STATISTICS STATION 12 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171C32	8/14-172032	11	.233-01	.253-01	-.997-02	.641-03

TABLE XI.- NON-NOMINAL CM CASES WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Concluded

(e) Case 11: 10-minute arc of 2- and 3-way tracking; solve for 3-way bias

STATION NUMBER 61 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME HMS	TC	C	CC3	C3	
171031	60	12		-.16016003 05 .114 00	-.0479
171131	60	12		-.16183769 05 .114 00	-.0077
171231	60	12		-.16331467 05 .114 00	.0159
171331	60	12		-.16459959 05 .115 00	.0063
171431	60	12		-.16570232 05 .115 00	-.0024
171531	60	12		-.16662958 05 .115 00	-.0117
171631	60	12		-.16739096 05 .116 00	-.0298
171731	60	12		-.16799288 05 .116 00	-.0386
171831	60	12		-.16844301 05 .117 00	-.0249
171931	60	12		-.16874835 05 .118 00	.0002
172031	60	12		-.16891550 05 .118 00	.0322

DATA STATISTICS STATION 61 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172031	11	.229-01	.249-01	-.984-02	.620-03

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0

(a) Case 12: 10-minute arc of 2- and 3-way tracking

```
ITERATION  NUMBER    3      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .28569-01    QSOS  .28569-01

  X   20571657124315252762646 0      Y   21367644655316052026505 4      Z   21255124146515710053250 3
 DX   60170527743654635245074 5     DY   17662612251014332606112 3     DZ   57757760462154456020626 6
000000 23443525422200000000000

 Q          DQ          STDEVDQ        APRIORI          OLD Q           NEW Q          NOMINAL Q        DQ(NOM)
                                       STDEVDQ

 X   -.41602934-02   .66871372 01   .00000000 00    .28925220 02    .28921059 02    .28179165 02    .74189448 00
 Y    .14848935-03   .36479645 01   .00000000 00    .17863023 04    .17863024 04    .17868292 04   -.52677917 00
 Z   -.32616596-02   .52706239 01   .00000000 00    .72263452 03    .72263126 03    .72203366 03    .59759521 00
DX   -.28615447-05   .29707035-02   .00000000 00   -.17709899 01   -.17709927 01   -.17708667 01   -.12603402-03
DY   -.63561671-05   .46421011-02   .00000000 00    .19832736 00    .19832100 00    .19760200 00    .71900151-03
DZ    .95774797-05   .60404267-02   .00000000 00   -.37477456 00   -.37476498 00   -.37465186 00   -.11312589-03

                                                                   DIFFERENCES

                                                                   PERICYNTHION

    TIME= 0. HRS
RAD -0.83131250E 03 VEL  0.73498535E 00 GAM -0.72253868E-02 PSI  0.16126633E-02 RAS -0.24056435E-01
DEC  0.22207737E-01 ALT -0.83130469E 03 RDP -0.79906250E 03 SMA  0.75575000E 03 ECC  0.14586002E-03
INC  0.19676924E-01 M M -0.12367249E-01 ASN -0.27656555E-02 AOP -0.94957352E-02 TAN -0.55509573E-03
 DR  0.35714869E 04  DV  0.24234714E 01

                                                                   ACQUISITION

    TIME= 0.62333333E 00 HRS
RAD -0.10837500E 03 VEL  0.36431885E 00 GAM  0.80225468E-02 PSI  0.17736435E-01 RAS -0.97675323E-02
DEC -0.10304928E-01 ALT -0.10843749E 03 RDP -0.45300000E 03 SMA  0.13488749E 04 ECC  0.15339628E-03
INC  0.20003796E-01 M M -0.22106171E-01 ASN -0.36125183E-02 AOP  0.23206711E-01 TAN -0.36846101E-03
 DR  0.21147731E 04  DV  0.18469458E 01

                                                                   END OF TRACK

    TIME= 0.80000000E 00 HRS
RAD  0.30487500E 03 VEL  0.19219571E 00 GAM  0.85208416E-02 PSI  0.14435768E-01 RAS -0.10093689E-01
DEC -0.14589310E-01 ALT  0.30493750E 03 RDP -0.21581250E 03 SMA  0.13306250E 04 ECC  0.12589246E-03
INC  0.19926786E-01 M M -0.21810532E-01 ASN -0.37841797E-02 AOP  0.21646500E-01 TAN -0.47124922E-03
 DR  0.28872900E 04  DV  0.15193491E 01
```

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(a) Case 12: 10-minute arc of 2- and 3-way tracking

J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.22032751 06	-.42783702 06	-.66744892 05	.51182047 09	-.39362948 09	-.28612781 08
Y	-.42783702 06	.83089083 06	.12969123 06	-.99336054 09	.76449765 09	.55832984 08
Z	-.66744892 05	.12969123 06	.20298607 05	-.15456645 09	.11936547 09	.89207160 07
DX	.51182047 09	-.99336054 09	-.15456645 09	.11919396 13	-.91365325 12	-.64907807 11
DY	-.39362948 09	.76449765 09	.11936547 09	-.91365325 12	.70344064 12	.51514655 11
DZ	-.28612781 08	.55832984 08	.89207160 07	-.64907807 11	.51514655 11	.45349083 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99993557 00	.99804600 00	-.99874856 00	.99986078 00	.90519358 00
Y	.99993557 00	-.10000000 01	-.99863205 00	.99817755 00	-.99997801 00	-.90956680 00
Z	.99804600 00	-.99863205 00	-.10000000 01	.99369933 00	-.99892271 00	-.92978457 00
DX	-.99874856 00	.99817755 00	.99369933 00	-.10000000 01	.99779323 00	.88284723 00
DY	.99986078 00	-.99997801 00	-.99892271 00	.99779323 00	-.10000000 01	-.91207976 00
DZ	.90519358 00	-.90956680 00	-.92978457 00	.88284723 00	-.91207976 00	-.10000000 01

J INVERSE ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.44717803 02	-.23589710 02	.34196638 02	-.13252750-01	.26950241-01	.94790919-02
Y	-.23589710 02	.13307645 02	-.17412840 02	.87971631-02	-.12570693-01	-.97153522-02
Z	.34196638 02	-.17412840 02	.27779476 02	-.80559141-02	.22770347-01	.15349022-02
DX	-.13252750-01	.87971631-02	-.80559141-02	.88250795-05	-.29909112-05	-.15791515-04
DY	.26950241-01	-.12570693-01	.22770347-01	-.29909112-05	.21549103-04	-.75801312-05
DZ	.94790919-02	-.97153522-02	.15349022-02	-.15791515-04	-.75801312-05	.36486756-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(a) Case 12: 10-minute arc of 2- and 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.44717803 02	-.23589710 02	.34196638 02	-.13252750-01	.26950241-01	.94790919-02
Y	-.23589710 02	.13307645 02	-.17412840 02	.87971631-02	-.12570693-01	-.97153522-02
Z	.34196638 02	-.17412840 02	.27779476 02	-.80559141-02	.22770347-01	.15349022-02
DX	-.13252750-01	.87971631-02	-.80559141-02	.88250795-05	-.29909112-05	-.15791515-04
DY	.26950241-01	-.12570693-01	.22770347-01	-.29909112-05	.21549103-04	-.75801312-05
DZ	.94790919-02	-.97153522-02	.15349022-02	-.15791515-04	-.75801312-05	.36486756-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.99999998 00	-.96701177 00	.97024442 00	-.66712382 00	.86817608 00	.23467070 00
Y	-.96701177 00	.10000000 01	-.90564287 00	.81176949 00	-.74232492 00	-.44090023 00
Z	.97024442 00	-.90564287 00	.10000000 01	-.51450960 00	.93066423 00	.48211545-01
DX	-.66712382 00	.81176949 00	-.51450960 00	.99999999 00	-.21688505 00	-.88002874 00
DY	.86817608 00	-.74232492 00	.93066423 00	-.21688505 00	.10000000 01	-.27033016 00
DZ	.23467070 00	-.44090023 00	.48211545-01	-.88002874 00	-.27033016 00	.10000000 01

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(a) Case 12: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3
171032	60 12	-.18991941 05 .100 00	-.0002
171132	60 12	-.19152751 05 .100 00	-.0068
171232	60 12	-.19293396 05 .100 00	.0042
171332	60 12	-.19414767 05 .100 00	.0007
171432	60 12	-.19517722 05 .100 00	.0051
171532	60 12	-.19603084 05 .100 00	.0007
171632	60 12	-.19671645 05 .100 00	-.0044
171732	60 12	-.19724161 05 .100 00	.0024
171832	60 12	-.19761353 05 .100 00	.0029
171932	60 12	-.19783912 05 .100 00	-.0042
172032	60 12	-.19792498 05 .100 00	-.0015

DATA STATISTICS STATION 12 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-172032	11	.362-02	.363-02	-.888-04	.131-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(a) Case 12: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC3	C3
171031	60	12	-.16016053 05 .114 00	.0022
171131	60	12	-.16183777 05 .114 00	.0009
171231	60	12	-.16331456 05 .114 00	.0049
171331	60	12	-.16459987 05 .115 00	-.0054
171431	60	12	-.16570231 05 .115 00	-.0039
171531	60	12	-.16663011 05 .115 00	.0010
171631	60	12	-.16739122 05 .116 00	-.0037
171731	60	12	-.16799321 05 .116 00	-.0054
171831	60	12	-.16844331 05 .117 00	.0042
171931	60	12	-.16874842 05 .118 00	.0073
172031	60	12	-.16891516 05 .118 00	-.0020

DATA STATISTICS STATION 61 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172031	11	.417-02	.417-02	.111-04	.174-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(b) Case 13: 20-minute arc of 2- way tracking with 18 minutes of 3-way tracking

ITERATION NUMBER 3 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .83041-01 QSOS .83041-01

X 20571224726515267603016 2 Y 21367645767616003554563 3 Z 21255113143115710174531 2
DX 60170531621154614041465 0 DY 17662532563514350701325 0 DZ 57757722731254467010561 4
000000 23443525422200000000000

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	.14134421-02	.14120521 01	.00000000 00	.28644015 02	.28645429 02	.28179165 02	.46626401 00
Y	-.19476646-02	.86006588 00	.00000000 00	.17863759 04	.17863740 04	.17868292 04	-.45520020 00
Z	.28805091-03	.12412013 01	.00000000 00	.72234951 03	.72234979 03	.72203366 03	.31613159 00
DX	-.18807613-05	.92615106-03	.00000000 00	-.17711031 01	-.17711049 01	-.17708667 01	-.23825466-03
DY	.11872034-06	.17664559-02	.00000000 00	.19795769 00	.19795781 00	.19760200 00	.35580992-03
DZ	.41461202-05	.26079399-02	.00000000 00	-.37431635 00	-.37431220 00	-.37465186 00	.33965706-03

DIFFERENCES

PERICYNTHION

TIME= 0. HRS
RAD -0.97331250E 03 VEL 0.65771484E 00 GAM -0.25881231E-02 PSI -0.12935638E-01 RAS -0.15181541E-01
ECC 0.13701439E-01 ALT -0.97326562E 03 RDP -0.96137500E 03 SMA -0.27050000E 03 ECC 0.85115433E-04
INC 0.53515434E-02 M M 0.44269562E-02 ASN 0.26294708E-01 AOP -0.34514427E-01 TAN -0.20217150E-03
DR 0.23761487E 04 DV 0.17931166E 01

ACQUISITION

TIME= 0.63333333E 00 HRS
RAD -0.11837500E 03 VEL 0.13427734E 00 GAM 0.52287579E-02 PSI 0.10670662E-01 RAS 0.13751984E-02
ECC 0.53821802E-02 ALT -0.11840625E 03 RDP -0.61393750E 03 SMA 0.32450000E 03 ECC 0.92528760E-04
INC 0.56827068E-02 M M -0.53186417E-02 ASN 0.25463104E-01 AOP -0.23002625E-02 TAN -0.89555979E-04
DR 0.84574036E 03 DV 0.86126731E 00

END OF TRACK

TIME= 0.96666666E 00 HRS
RAD 0.24125000E 03 VEL -0.49652100E-01 GAM 0.28624535E-02 PSI 0.12692451E-01 RAS -0.15411377E-02
ECC -0.28872490E-03 ALT 0.24118750E 03 RDP -0.26212500E 03 SMA 0.20212500E 03 ECC 0.44401735E-04
INC 0.55482388E-02 M M -0.33149719E-02 ASN 0.25074005E-01 AOP -0.11352539E-01 TAN -0.64432621E-04
DR 0.35207356E 03 DV 0.84620021E 00

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(b) Case 13: 20-minute arc of 2- way tracking with 18 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.30904271 06	-.58933598 06	-.84200772 05	.74845804 09	-.54357785 09	-.22372735 08
Y	-.58933598 06	.11252147 07	.16174452 06	-.14237755 10	.10375837 10	.44773262 08
Z	-.84200772 05	.16174452 06	.23975009 05	-.20076504 09	.14897423 09	.79716888 07
DX	.74845804 09	-.14237755 10	-.20076504 09	.18238142 13	-.13135054 13	-.47791521 11
DY	-.54357785 09	.10375837 10	.14897423 09	-.13135054 13	.95691309 12	.41073151 11
DZ	-.22372735 08	.44773262 08	.79716888 07	-.47791521 11	.41073151 11	.53182311 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	-.99999999 00	.99939231 00	.97819948 00	-.99693745 00	.99957698 00	.55185658 00
Y	.99939231 00	-.10000000 01	-.98476475 00	.99387901 00	-.99992904 00	-.57878521 00
Z	.97819948 00	-.98476475 00	-.10000000 01	.96010426 00	-.98354791 00	-.70597178 00
DX	-.99693745 00	.99387901 00	.96010426 00	-.10000000 01	.99427227 00	.48526274 00
DY	.99957698 00	-.99992904 00	-.98354791 00	.99427227 00	-.10000000 01	-.57575560 00
DZ	.55185658 00	-.57878521 00	-.70597178 00	.48526274 00	-.57575560 00	-.10000000 01

J INVERSE ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.19938911 01	-.10784473 01	.12507875 01	-.14905890-03	.19310276-02	-.66067632-03
Y	-.10784473 01	.73971330 00	-.71144775 00	.24031998-03	-.97305239-03	-.23347570-04
Z	.12507875 01	-.71144775 00	.15405806 01	.58014492-03	.21403596-02	-.23746550-02
DX	-.14905890-03	.24031998-03	.58014492-03	.85775581-06	.84076601-06	-.23050813-05
DY	.19310276-02	-.97305239-03	.21403596-02	.84076601-06	.31203665-05	-.34362902-05
DZ	-.66067632-03	-.23347570-04	-.23746550-02	-.23050813-05	-.34362902-05	.68013506-05

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(b) Case 13: 20-minute arc of 2- way tracking with 18 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.19938911 01	-.10784473 01	.12507875 01	-.14905890-03	.19310276-02	-.66067632-03
Y	-.10784473 01	.73971330 00	-.71144775 00	.24031998-03	-.97305239-03	-.23347570-04
Z	.12507875 01	-.71144775 00	.15405806 01	.58014492-03	.21403596-02	-.23746550-02
DX	-.14905890-03	.24031998-03	.58014492-03	.85775581-06	.84076601-06	-.23050813-05
DY	.19310276-02	-.97305239-03	.21403596-02	.84076601-06	.31203665-05	-.34362902-05
DZ	-.66067632-03	-.23347570-04	-.23746550-02	-.23050813-05	-.34362902-05	.68013506-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.99999999 00	-.88800725 00	.71365876 00	-.11397914 00	.77416754 00	-.17940743 00
Y	-.88800725 00	.99999998 00	-.66645230 00	.30170070 00	-.64047427 00	-.10409081-01
Z	.71365876 00	-.66645230 00	.10000000 01	.50467576 00	.97620659 00	-.73360239 00
DX	-.11397914 00	.30170070 00	.50467576 00	.10000000 01	.51391406 00	-.95434812 00
DY	.77416754 00	-.64047427 00	.97620659 00	.51391406 00	.99999999 00	-.74591518 00
DZ	-.17940743 00	-.10409081-01	-.73360239 00	-.95434812 00	-.74591518 00	.10000000 01

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(b) Case 13: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3
171032	60 12	-.18991940 05 .100 00	-.0015
171132	60 12	-.19152749 05 .100 00	-.0090
171232	60 12	-.19293394 05 .100 00	.0022
171332	60 12	-.19414765 05 .100 00	-.0012
171432	60 12	-.19517721 05 .100 00	.0042
171532	60 12	-.19603084 05 .100 00	.0007
171632	60 12	-.19671647 05 .100 00	-.0024
171732	60 12	-.19724163 05 .100 00	.0049
171832	60 12	-.19761356 05 .100 00	.0063
171932	60 12	-.19783916 05 .100 00	-.0002
172032	60 12	-.19792502 05 .100 00	.0020
172132	60 12	-.19787738 05 .100 00	.0049
172232	60 12	-.19770223 05 .100 00	-.0022
172332	60 12	-.19740523 05 .100 00	.0061
172432	60 12	-.19699178 05 .100 00	-.0056
172532	60 12	-.19646699 05 .100 00	-.0007
172632	60 12	-.19583575 05 .100 00	-.0002
172732	60 12	-.19510265 05 .100 00	-.0015
172832	60 12	-.19427207 05 .100 00	-.0010
172932	60 12	-.19334817 05 .100 00	-.0078
173032	60 12	-.19233488 05 .100 00	.0042

DATA STATISTICS STATION 12 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-173032	21	.415-02	.415-02	.930-04	.172-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(b) Case 13: 20-minute arc of 2- way tracking with 18 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3
171031	60	12		-.16016059 05 .114 00 .0077
171131	60	12		-.16183779 05 .114 00 .0029
171231	60	12		-.16331458 05 .114 00 .0063
171331	60	12		-.16459988 05 .115 00 -.0051
171431	60	12		-.16570230 05 .115 00 -.0046
171531	60	12		-.16663010 05 .115 00 .0002
171631	60	12		-.16739122 05 .116 00 -.0044
171731	60	12		-.16799320 05 .116 00 -.0063
171831	60	12		-.16844328 05 .117 00 .0022
171931	60	12		-.16874840 05 .118 00 .0054
172031	60	12		-.16891512 05 .118 00 -.0059
172131	60	12		-.16894971 05 .119 00 .0032
172231	60	12		-.16885814 05 .119 00 -.0125
172331	60	12		-.16864609 05 .120 00 -.0010
172431	60	12		-.16831894 05 .121 00 -.0073
172531	60	12		-.16788182 05 .122 00 .0061
172631	60	12		-.16733959 05 .123 00 .0076
172731	60	12		-.16669684 05 .123 00 .0076
172831	60	12		-.16595796 05 .124 00 .0027

DATA STATISTICS STATION 61 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172831	19	.590-02	.590-02	.251-03	.349-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(c) Case 14: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .10567 00    QSOS  .10567 00

  X   20571035052515200377643 0      Y   21367646734016323112505 7      Z   21255111075715705446114 6
 DX   60170531500454626553704 6     DY   17562514707714360717450 2     DZ   57757720563154420734610 2
000000 23443525422200000000000 0

Q          DQ          STDEVDQ        APRIORI STDEVDQ        OLD Q          NEW Q          NOMINAL Q       DQ(NOM)

 X    .40583123-04   .63004582 00   .00000000 00    .28528361 02    .28528401 02    .28179165 02    .34923673 00
 Y   -.24425492-02   .55043039 00   .00000000 00    .17354326 04    .17864302 04    .17868292 04   -.39901733 03
 Z    .56697667-02   .82390602 00   .00000000 00    .72227935 03    .72228502 03    .72203366 03    .25135803 00
DX    .21981636-05   .54228690-03   .00000000 00   -.17710975 01   -.17710953 01   -.17708667 01   -.22864342-03
DY    .51336691-05   .10339072-02   .00000000 00    .19784712 00    .19785225 00    .19760200 00    .25025382-03
DZ   -.76852398-05   .15671763-02   .00000000 00   -.37427095 00   -.37427864 00   -.37465186 00    .37321820-03

                                                                DIFFERENCES
                                                                PERICYNTHION

   TIME= 0. HRS
RAD -0.88768750E 03 VEL  0.56683350E 00 GAM -0.13042316E-02 E   -0.13616562E-01 RAS -0.11400223E-01
DEC  0.11310577E-01 ALT -0.98767187E 03 RDP -0.88156250E 03 SMA -0.43475000E 03 ECC  0.63739717E-04
INC  0.29854774E-02 M M  0.71153641E-02 ASN  0.29823853E-01 AOP -0.35397530E-01 TAN -0.10398356E-03
 DR  0.19252649E 04  DV  0.16540898E 01                        ACQUISITION
   TIME= 0.63333333E 00 HRS
RAD -0.74375000E 02 VEL  0.74340820E-01 GAM  0.41141510E-02 PSI  0.90409325E-02 RAS  0.27694702E-02
DEC  0.72922707E-02 ALT -0.74437500E 02 RDP -0.53412500E 03 SMA  0.16000000E 03 ECC  0.71112067E-04
INC  0.33156872E-02 M M -0.26226044E-02 ASN  0.27984619E-01 AOP -0.63343048E-02 TAN -0.36150217E-04
 DR  0.11758260E 04  DV  0.65456533E 00                        END OF TRACK

   TIME= 0.11333333E 01 HRS
RAD  0.16175000E 03 VEL -0.90026855E-01 GAM -0.26881695E-03 PSI  0.12709618E-01 RAS -0.13408661E-02
DEC -0.35142899E-03 ALT  0.16168750E 03 RDP -0.17031250E 03 SMA -0.80125000E 02 ECC  0.12602657E-04
INC  0.31504631E-02 M M  0.13151169E-02 ASN  0.27374269E-01 AOP -0.22106171E-01 TAN  0.10327995E-03
 DR  0.28765552E 03  DV  0.76008447E 00
```

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(c) Case 14: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.32924603 06	-.61336528 06	-.79374761 05	.80375092 09	-.57346649 09	-.15285482 08
Y	-.61336528 06	.11575005 07	.15838666 06	-.14907213 10	.10741440 10	.37303060 08
Z	-.79374761 05	.15838666 06	.26664647 05	-.18829200 09	.14248295 09	.10293434 08
DX	.80375092 09	-.14907213 10	-.18829200 09	.19756107 13	-.13956608 13	-.28654815 11
DY	-.57346649 09	.10741440 10	.14248295 09	-.13956608 13	.10013959 13	.30836069 11
DZ	-.15285482 08	.37303060 08	.10293434 08	-.28654815 11	.30836069 11	.80756570 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.99999999 00	.99356965 00	.84713814 00	-.99657623 00	.99872259 00	.29643531 00
Y	.99356965 00	-.10000000 01	-.90155057 00	.98579175 00	-.99769784 00	-.38582906 00
Z	.84713814 00	-.90155057 00	-.10000000 01	.82037663 00	-.87195104 00	-.70146082 00
DX	-.99657623 00	.98579175 00	.82037663 00	-.10000000 01	.99226183 00	.22686003 00
DY	.99872259 00	-.99769784 00	-.87195104 00	.99226183 00	-.10000000 01	-.34289976 00
DZ	.29643531 00	-.38582906 00	-.70146082 00	.22686003 00	-.34289976 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.39695774 00	-.28002891 00	.28306417 00	-.31370307-04	.44793868-03	-.13765509-03
Y	-.28002891 00	.30297362 00	-.32701636 00	.38259709-04	-.38881045-03	.10768316-03
Z	.28306417 00	-.32701636 00	.67882112 00	.26351823-03	.81412065-03	-.99250516-03
DX	-.31370307-04	.38259709-04	.26351823-03	.29407508-06	.33866020-06	-.82166740-06
DY	.44793868-03	-.38881045-03	.81412065-03	.33866020-06	.10689642-05	-.12739181-05
DZ	-.13765509-03	.10768316-03	-.99250516-03	-.82166740-06	-.12739181-05	.24560416-05

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(c) Case 14: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.39695774 00	-.28002891 00	.28306417 00	-.31370307-04	.44793868-03	-.13765509-03
Y	-.28002891 00	.30297362 00	-.32701636 00	.38259709-04	-.38881045-03	.10768316-03
Z	.28306417 00	-.32701636 00	.67882112 00	.26351823-03	.81412065-03	-.99250516-03
DX	-.31370307-04	.38259709-04	.26351823-03	.29407508-06	.33866020-06	-.82166740-06
DY	.44793868-03	-.38881045-03	.81412065-03	.33866020-06	.10589642-05	-.12739181-05
DZ	-.13765509-03	.10768316-03	-.99250516-03	-.82166740-06	-.12739181-05	.24560416-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.80747357 00	.54529948 00	-.91815818-01	.68764589 00	-.13941268 00
Y	-.80747357 00	.99999999 00	-.72108987 00	.12817701 00	-.68320958 00	.12483246 00
Z	.54529948 00	-.72108987 00	.99999999 00	.58979879 00	.95571744 00	-.76866521 00
DX	-.91815818-01	.12817701 00	.58979879 00	.10000000 01	.60402299 00	-.96682769 00
DY	.68764589 00	-.68320958 00	.95571744 00	.60402299 00	.99999999 00	-.78621636 00
DZ	-.13941268 00	.12483246 00	-.76866521 00	-.96682769 00	-.78621636 00	.99999999 00

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(c) Case 14: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC3
171032	60 12	-.18991942 05 .100 00	-.0000
171132	60 12	-.19152749 05 .100 00	-.0093
171232	60 12	-.19293392 05 .100 00	.0010
171332	60 12	-.19414763 05 .100 00	-.0032
171432	60 12	-.19517719 05 .100 00	.0024
171532	60 12	-.19603082 05 .100 00	-.0010
171632	60 12	-.19671646 05 .100 00	-.0042
171732	60 12	-.19724162 05 .100 00	.0037
171832	60 12	-.19761356 05 .100 00	.0059
171932	60 12	-.19783917 05 .100 00	.0005
172032	60 12	-.19792503 05 .100 00	.0032
172132	60 12	-.19787740 05 .100 00	.0063
172232	60 12	-.19770225 05 .100 00	-.0002
172332	60 12	-.19740525 05 .100 00	.0085
172432	60 12	-.19699180 05 .100 00	-.0037
172532	60 12	-.19646701 05 .100 00	.0012
172632	60 12	-.19583576 05 .100 00	.0012
172732	60 12	-.19510266 05 .100 00	-.0005
172832	60 12	-.19427207 05 .100 00	-.0010
172932	60 12	-.19334816 05 .100 00	-.0093
173032	60 12	-.19233484 05 .100 00	.0010
173132	60 12	-.19123587 05 .100 00	-.0046
173232	60 12	-.19005475 05 .100 00	-.0002
173332	60 12	-.18879484 05 .100 00	.0007
173432	60 12	-.18745930 05 .100 00	-.0034
173532	60 12	-.18605113 05 .100 00	-.0034
173632	60 12	-.18457317 05 .100 00	.0007
173732	60 12	-.18302811 05 .100 00	.0024
173832	60 12	-.18141847 05 .100 00	-.0029
173932	60 12	-.17974667 05 .100 00	.0002
174032	60 12	-.17801498 05 .100 00	.0063

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-174032	31	.401-02	.401-02	-.473-04	.161-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(c) Case 14: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
171031	60	12		-.16016061 05 .114 00	.0101
171131	60	12		-.16183780 05 .114 00	.0040
171231	60	12		-.16331457 05 .114 00	.0054
171331	60	12		-.16453987 05 .115 00	-.0061
171431	60	12		-.16570228 05 .115 00	-.0063
171531	60	12		-.16663009 05 .115 00	-.0010
171631	60	12		-.16739121 05 .116 00	-.0056
171731	60	12		-.16799319 05 .116 00	-.0076
171831	60	12		-.16844328 05 .117 00	.0017
171931	60	12		-.16874840 05 .118 00	.0051
172031	60	12		-.16891512 05 .118 00	-.0059
172131	60	12		-.16894971 05 .119 00	.0034
172231	60	12		-.16885815 05 .119 00	-.0115
172331	60	12		-.16864609 05 .120 00	-.0002
172431	60	12		-.16831894 05 .121 00	-.0071
172531	60	12		-.16788183 05 .122 00	.0066
172631	60	12		-.16733959 05 .123 00	.0076
172731	60	12		-.16659683 05 .123 00	.0071
172831	60	12		-.16595794 05 .124 00	.0010
173231	60	12		-.16212062 05 .128 00	.0020
173331	60	12		-.16095896 05 .129 00	.0033
173431	60	12		-.15972297 05 .131 00	-.0039
173531	60	12		-.15841562 05 .132 00	.0029
173631	60	12		-.15703975 05 .134 00	-.0011
173731	60	12		-.15559802 05 .135 00	.0007
173831	60	12		-.15409296 05 .137 00	-.0056

DATA STATISTICS STATION 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.553-02	.553-02	-.376-04	.306-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(d) Case 15: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

ITERATION NUMBER 4 EPOCH 66/08/14 153152.013 CLOCK L25140 SOS .12202 00 QSOS .12202 00

X 20570771376715260176215 2 Y 21367647144716073020505 5 Z 21255110431115745561055 5
DX 60170531435154614734274 3 DY 17562510453214372125034 3 DZ 57757720246354455257435 5
000000 23443525422200000000000 0

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.27950822-02	.42619083 00	.00000000 00	.28496445 02	.28493650 02	.28179165 02	.31448531 00
Y	.33178385-02	.50196859 00	.00000000 00	.17864465 04	.17864498 04	.17868292 04	-.37937927 00
Z	-.56262097-02	.79708727 00	.00000000 00	.72227278 03	.72226716 03	.72203366 03	.23348999 00
DX	-.15513749-05	.52664454-03	.00000000 00	-.17710896 01	-.17710911 01	-.17708667 01	-.22442539-03
DY	-.67348620-05	.93508277-03	.00000000 00	.19782626 00	.19781952 00	.19760200 00	.21752156-03
DZ	.67305669-05	.15291535-02	.00000000 00	-.37427927 00	-.37427254 00	.37465186 00	.37932023-03

DIFFERENCES

PERICYNTHION

TIME= 0. HRS
RAD -0.85487500E 03 VEL 0.53979492E 00 GAM -0.93510002E-03 PSI -0.13434410E-01 RAS -0.10276794E-01
DEC 0.10797739E-01 ALT -0.85485156E 03 RDP -0.85031250E 03 SMA -0.45312500E 03 ECC 0.58856840E-04
INC 0.26391016E-02 M M 0.74157715E-02 ASN 0.29006953E-01 AOP -0.35179138E-01 TAN -0.75882301E-04
DR 0.18046032E 04 DV 0.16032695E 01

ACQUISITION

TIME= 0.63333333E 00 HRS
RAD -0.47625000E 02 VEL 0.56640625E-01 GAM 0.38609505E-02 PSI 0.87804794E-02 RAS 0.28705597E-02
DEC 0.75423717E-02 ALT -0.47625000E 02 RDP -0.50281250E 03 SMA 0.14175000E 03 ECC 0.66265464E-04
INC 0.29678345E-02 M M -0.23241043E-02 ASN 0.28171539E-01 AOP -0.71449280E-02 TAN -0.24527311E-04
DR 0.12149521E 04 DV 0.62155170E 00

END OF TRACK

TIME= 0.13000000E 01 HRS
RAD 0.82000000E 02 VEL -0.36160889E-01 GAM -0.21077394E-02 PSI 0.12573242E-01 RAS -0.17585754E-02
DEC -0.23491383E-02 ALT 0.82000000E 02 RDP -0.19750000E 03 SMA -0.20700000E 03 ECC 0.58524311E-03
INC 0.27916431E-02 M M 0.33931730E-02 ASN 0.27332306E-01 AOP -0.28049469E-01 TAN 0.18159300E-03
DR 0.56117744E 03 DV 0.72962945E 00

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(d) Case 15: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.33032003 06	-.61786827 06	-.80958853 05	.80910629 09	-.57587792 09	-.15125417 08
Y	-.61786827 06	.12281105 07	.19606082 06	-.15429941 10	.10982059 10	.44161836 08
Z	-.80958853 05	.19606082 06	.47620065 05	-.21406511 09	.15440751 09	.14580164 08
DX	.80910629 09	-.15429941 10	-.21406511 09	.20195595 13	-.14157422 13	-.32176117 11
DY	-.57587792 09	.10982059 10	.15440751 09	-.14157422 13	.10105695 13	.32500450 11
DZ	-.15125417 08	.44161836 08	.14580164 08	-.32176117 11	.32500450 11	.92032423 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.99999999 00	.97008485 00	.64550840 00	-.99062619 00	.99673539 00	.27432758 00
Y	.97008485 00	-.10000000 01	-.81073159 00	.97975442 00	-.98578447 00	-.41539185 00
Z	.64550840 00	-.81073159 00	-.10000000 01	.69027569 00	-.70386657 00	-.69646131 00
DX	-.99062619 00	.97975442 00	.69027569 00	-.10000000 01	.99099796 00	.23601244 00
DY	.99673539 00	-.98578447 00	-.70386657 00	.99099796 00	-.10000000 01	-.33700462 00
DZ	.27432758 00	-.41539185 00	-.69646131 00	.23601244 00	-.33700462 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.18163862 00	-.17648795 00	.19241787 00	-.11515862-04	.25273289-03	-.92202369-04
Y	-.17648795 00	.25197247 00	-.28593362 00	.24488329-04	-.29952724-03	.97210067-04
Z	.19241787 00	-.28593362 00	.63534810 00	.26299397-03	.72227529-03	-.94943421-03
DX	-.11515862-04	.24488329-04	.26299397-03	.27735447-06	.34046728-06	-.78573146-06
DY	.25273289-03	-.29952724-03	.72227529-03	.34046728-06	.87437978-06	-.11890756-05
DZ	-.92202369-04	.97210067-04	-.94943421-03	-.78573146-06	-.11890756-05	.23383104-05

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(d) Case 15: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.18163862 00	-.17648795 00	.19241787 00	-.11515862-04	.25273289-03	-.92202369-04
Y	-.17648795 00	.25197247 00	-.28593362 00	.24488329-04	-.29952724-03	.97210067-04
Z	.19241787 00	-.28593362 00	.63534810 00	.26299397-03	.72227529-03	-.94943421-03
DX	-.11515862-04	.24488329-04	.26299397-03	.27735447-06	.34046728-06	-.78573146-06
DY	.25273289-03	-.29952724-03	.72227529-03	.34046728-06	.87437978-06	-.11890756-05
DZ	-.92202369-04	.97210067-04	-.94943421-03	-.78573146-06	-.11890756-05	.23383104-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.82496290 00	.56641587 00	-.51306778-01	.63417279 00	-.14147734 00
Y	-.82496290 00	.10000000 01	-.71463256 00	.92632847-01	-.63813081 00	.12664371 00
Z	.56641587 00	-.71463256 00	.99999998 00	.62650181 00	.96905144 00	-.77894703 00
DX	-.51306778-01	.92632847-01	.62650181 00	.99999997 00	.69136555 00	-.97567567 00
DY	.63417279 00	-.63813081 00	.96905144 00	.69136555 00	.99999999 00	-.83158823 00
DZ	-.14147734 00	.12664371 00	-.77894703 00	-.97567567 00	-.83158823 00	.10000000 01

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(d) Case 15: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3				
171032	60	12	-.18991943	05	.100	00	.0015
171132	60	12	-.19152750	05	.100	00	-.0081
171232	60	12	-.19293393	05	.100	00	.0015
171332	60	12	-.19414763	05	.100	00	-.0034
171432	60	12	-.19517718	05	.100	00	.0017
171532	60	12	-.19603081	05	.100	00	-.0017
171632	60	12	-.19671645	05	.100	00	-.0049
171732	60	12	-.19724162	05	.100	00	.0032
171832	60	12	-.19761356	05	.100	00	.0056
171932	60	12	-.19783917	05	.100	00	.0002
172032	60	12	-.19792503	05	.100	00	.0032
172132	60	12	-.19787740	05	.100	00	.0066
172232	60	12	-.19770225	05	.100	00	-.0000
172332	60	12	-.19740525	05	.100	00	.0085
172432	60	12	-.19699180	05	.100	00	-.0027
172532	60	12	-.19646703	05	.100	00	.0027
172632	60	12	-.19583577	05	.100	00	.0024
172732	60	12	-.19510267	05	.100	00	.0005
172832	60	12	-.19427209	05	.100	00	.0005
172932	60	12	-.19334817	05	.100	00	-.0083
173032	60	12	-.19233486	05	.100	00	.0024
173132	60	12	-.19123588	05	.100	00	-.0034
173232	60	12	-.19005476	05	.100	00	.0007
173332	60	12	-.18879484	05	.100	00	.0010
173432	60	12	-.18745930	05	.100	00	-.0034
173532	60	12	-.18605113	05	.100	00	-.0037
173632	60	12	-.18457316	05	.100	00	-.0002
173732	60	12	-.18302809	05	.100	00	.0010
173832	60	12	-.18141845	05	.100	00	-.0051
173932	60	12	-.17974664	05	.100	00	-.0029
174032	60	12	-.17801494	05	.100	00	.0022
174132	60	12	-.17622549	05	.100	00	-.0007
174232	60	12	-.17438034	05	.100	00	.0005
174332	60	12	-.17248139	05	.100	00	.0054
174432	60	12	-.17053046	05	.100	00	-.0042
174532	60	12	-.16852927	05	.100	00	.0017
174632	60	12	-.16647944	05	.100	00	.0029
174732	60	12	-.16438250	05	.100	00	-.0002
174832	60	12	-.16223989	05	.100	00	-.0023
174932	60	12	-.16005298	05	.100	00	.0062

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(d) Case 15: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

175032 60 12 -.15782305 05 .100 00 -.0031

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-175032	41	.371-02	.371-02	.923-04	.138-04

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3
171031	60	12		-.16015062 05 .114 00 .0107
171131	60	12		-.16183780 05 .114 00 .0037
171231	60	12		-.16331456 05 .114 00 .0046
171331	60	12		-.16459985 05 .115 00 -.0073
171431	60	12		-.16573227 05 .115 00 -.0073
171531	60	12		-.16663007 05 .115 00 -.0024
171631	60	12		-.16739119 05 .116 00 -.0073
171731	60	12		-.16799317 05 .116 00 -.0090
171831	60	12		-.16844327 05 .117 00 .0007
171931	60	12		-.16874839 05 .118 00 .0046
172031	60	12		-.16891511 05 .118 00 -.0066
172131	60	12		-.16894971 05 .119 00 .0032
172231	60	12		-.16885815 05 .119 00 -.0115
172331	60	12		-.16864610 05 .120 00 -.0000
172431	60	12		-.16831895 05 .121 00 -.0061
172531	60	12		-.16788183 05 .122 00 .0068
172631	60	12		-.16733960 05 .123 00 .0083
172731	60	12		-.16669684 05 .123 00 .0081
172831	60	12		-.16595795 05 .124 00 .0020
173231	60	12		-.16212062 05 .128 00 .0023
173331	60	12		-.16095896 05 .129 00 .0035
173431	60	12		-.15972297 05 .131 00 -.0045
173531	60	12		-.15841562 05 .132 00 .0023
173631	60	12		-.15703974 05 .134 00 -.0026
173731	60	12		-.15559800 05 .135 00 -.0010
173831	60	12		-.15409293 05 .137 00 -.0077

DATA STATISTICS STATION 61 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.599-02	.601-02	-.479-03	.361-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(e) Case 16: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION  NUMBER     4      EPOCH  65/08/14  163152.013    CLOCK  L25140    SOS  .25628 00    QSOS  .25628 00

  X    20571001666115244742042 2      Y    21367647742116044255737 4      Z    21255111560415736646627 7
 DX    60170527745754616470611 0      DY   17562524745214305550435 5      DZ   57757741171354444503440 0
000000 23443525422200000000000
```

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	.52873237-03	.38446906 00	.00000000 00	.28501283 02	.28501812 02	.28179165 02	.32264733 00
Y	-.55713510-03	.47292295 00	.00000000 00	.17864969 04	.17864963 04	.17868292 04	-.33283997 00
Z	.15002333-03	.77803293 00	.00000000 00	.72230358 03	.72230374 03	.72203366 03	.27007294 00
DX	-.47449990-06	.42676421-03	.00000000 00	-.17709925 01	-.17709930 01	-.17708667 01	-.12628734-03
DY	.19719783-06	.85061443-03	.00000000 00	.19791353 00	.19791372 00	.19760200 00	.31172670-03
DZ	.98161253-06	.12817626-02	.00000000 00	-.37453158 00	-.37453059 00	-.37465186 00	.12125192-03

DIFFERENCES

PERICYNTHION

```
   TIME= 0.HRS
RAD -0.66500000E 03 VEL  0.43231201E 00 GAM -0.15737265E-02 PSI -0.46796799E-02 RAS -0.10513306E-01
DEC -0.11095047E-01 ALT -0.66495312E 03 RDP -0.65781250E 03 SMA -0.28187500E 03 ECC  0.50824136E-04
INC  0.71556568E-02 M M  0.46119690E-02 ASN  0.11287689E-01 AOP -0.18579529E-01 TAN -0.12284750E-03
 DR  0.17602985E 04  DV  0.11730150E 01
```

ACQUISITION

```
   TIME= 0.63333333E 00 HRS
RAD -0.51500000E 02 VEL  0.98022461E-01 GAM  0.32150745E-02 PSI  0.92391968E-02 RAS -0.21781521E-02
DEC -0.15020370E-04 ALT -0.51593750E 02 RDP -0.31031250E 03 SMA  0.31350000E 03 ECC  0.58244914E-04
INC  0.74944360E-02 M M -0.51383972E-02 ASN  0.10448456E-01 AOP  0.14448166E-02 TAN -0.82522631E-04
 DR  0.32254254E 03  DV  0.80215670E 00
```

END OF TRACK

```
   TIME= 0.16333333E 01 HRS
RAD -0.67875000E 02 VEL -0.40954590E-01 GAM -0.34211874E-02 PSI  0.23479462E-02 RAS -0.19264221E-02
DEC -0.85127254E-02 ALT -0.67812500E 02 RDP -0.22281250E 03 SMA -0.20625000E 03 ECC  0.86873770E-05
INC  0.73273182E-02 M M  0.33836365E-02 ASN  0.92048645E-02 AOP -0.15131950E-01 TAN  0.15661120E-03
 DR  0.17846925E 04  DV  0.12941559E 00
```

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(e) Case 16: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.38169349 06	-.91285805 06	-.19327889 06	.11683445 10	-.71045477 09	.66797114 07
Y	-.91285805 06	.29226022 07	.84227071 06	-.36036468 10	.18708909 10	-.79387197 08
Z	-.19327889 06	.84227071 06	.29462892 06	-.99778429 09	.44891455 09	-.31589064 08
DX	.11683445 10	-.36036468 10	-.99778429 09	.45347859 13	-.23555743 13	.12209675 12
DY	-.71045477 09	.18708909 10	.44891455 09	-.23555743 13	.13630696 13	-.23994656 11
DZ	.66797114 07	-.79387197 08	-.31589064 08	.12209675 12	-.23994656 11	.19897166 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.86429305 00	.57635406 00	-.88804534 00	.98496328 00	-.76648685-01
Y	.86429305 00	-.99999999 00	-.90767244 00	.98987184 00	-.93735602 00	.32920771 00
Z	.57635406 00	-.90767244 00	-.99999999 00	.86321818 00	-.70838110 00	.41257552 00
DX	-.88804534 00	.98987184 00	.86321818 00	-.10000000 01	.94745673 00	-.40647151 00
DY	.98496328 00	-.93735602 00	-.70838110 00	.94745673 00	-.10000000 01	.14570012 00
DZ	-.76648685-01	.32920771 00	.41257552 00	-.40647151 00	.14570012 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.14781646 00	-.16627569 00	.16458412 00	-.30795657-04	.19740883-03	-.24710397-04
Y	-.16627569 00	.22365612 00	-.29081289 00	-.15843188-04	-.32180544-03	.19562531-03
Z	.16458412 00	-.29081289 00	.60533524 00	.22287373-03	.65610922-03	-.83093565-03
DX	-.30795657-04	-.15843188-04	.22287373-03	.18212769-06	.23770553-06	-.52998528-06
DY	.19740883-03	-.32180544-03	.65610922-03	.23770553-06	.72354491-06	-.89469283-06
DZ	-.24710397-04	.19562531-03	-.83093565-03	-.52998528-06	-.89469283-06	.16429153-05

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(e) Case 16: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.14781646 00	-.16627569 00	.16458412 00	-.30795657-04	.19740883-03	-.24710397-04
Y	-.16627569 00	.22365612 00	-.29081289 00	-.15843188-04	-.32180544-03	.19562531-03
Z	.16458412 00	-.29081289 00	.60533524 00	.22287373-03	.65610922-03	-.83093565-03
DX	-.30795657-04	-.15843188-04	.22287373-03	.18212769-06	.23770553-06	-.52998528-06
DY	.19740883-03	-.32180544-03	.65610922-03	.23770553-06	.72354491-06	-.89469283-06
DZ	-.24710397-04	.19562531-03	-.83093565-03	-.52998528-06	-.89469283-06	.16429153-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.91448580 00	.55021010 00	-.18768955 00	.60363223 00	-.50143047-01
Y	-.91448580 00	.10000000 01	-.79036061 00	-.78499011-01	-.79996365 00	.32272088 00
Z	.55021010 00	-.79036061 00	.99999999 00	.67123239 00	.99139202 00	-.83322410 00
DX	-.18768955 00	-.78499011-01	.67123239 00	.10000000 01	.65481488 00	-.96887605 00
DY	.60363223 00	-.79996365 00	.99139202 00	.65481488 00	.10000000 01	-.82060397 00
DZ	-.50143047-01	.32272088 00	-.83322410 00	-.96887605 00	-.82060397 00	.10000000 01

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(e) Case 16: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC3					
171032	60	12	-.18991943	05	.100	00	.0015
171132	60	12	-.19152750	05	.100	00	-.0081
171232	60	12	-.19293393	05	.100	00	.0012
171332	60	12	-.19414763	05	.100	00	-.0039
171432	60	12	-.19517718	05	.100	00	.0017
171532	60	12	-.19603081	05	.100	00	-.0020
171632	60	12	-.19671645	05	.100	00	-.0051
171732	60	12	-.19724161	05	.100	00	.0024
171832	60	12	-.19761355	05	.100	00	.0054
171932	60	12	-.19783916	05	.100	00	-.0005
172032	60	12	-.19792503	05	.100	00	.0027
172132	60	12	-.19787739	05	.100	00	.0061
172232	60	12	-.19770224	05	.100	00	-.0007
172332	60	12	-.19740524	05	.100	00	.0078
172432	60	12	-.19699180	05	.100	00	-.0037
172532	60	12	-.19646701	05	.100	00	.0007
172632	60	12	-.19583575	05	.100	00	.0005
172732	60	12	-.19510265	05	.100	00	-.0015
172832	60	12	-.19427206	05	.100	00	-.0022
172932	60	12	-.19334814	05	.100	00	-.0112
173032	60	12	-.19233482	05	.100	00	-.0012
173132	60	12	-.19123584	05	.100	00	-.0076
173232	60	12	-.19005472	05	.100	00	-.0032
173332	60	12	-.18879480	05	.100	00	-.0029
173432	60	12	-.18745925	05	.100	00	-.0083
173532	60	12	-.18605108	05	.100	00	-.0083
173632	60	12	-.18457312	05	.100	00	-.0049
173732	60	12	-.18302804	05	.100	00	-.0044
173832	60	12	-.18141840	05	.100	00	-.0100
173932	60	12	-.17974659	05	.100	00	-.0073
174032	60	12	-.17801489	05	.100	00	-.0027
174132	60	12	-.17622545	05	.100	00	-.0051
174232	60	12	-.17438029	05	.100	00	-.0042
174332	60	12	-.17248134	05	.100	00	.0010
174432	60	12	-.17053042	05	.100	00	-.0076
174532	60	12	-.16852925	05	.100	00	-.0002
174632	60	12	-.16647943	05	.100	00	.0015
174732	60	12	-.16438249	05	.100	00	-.0007
174832	60	12	-.16223990	05	.100	00	-.0016
174932	60	12	-.16005300	05	.100	00	.0083
175032	60	12	-.15782308	05	.100	00	-.0001
175132	60	12	-.15555137	05	.100	00	.0043
175232	60	12	-.15323901	05	.100	00	.0006
175332	60	12	-.15088705	05	.100	00	.0054
175432	60	12	-.14849654	05	.100	00	.0042
175532	60	12	-.14606841	05	.100	00	.0081
175632	60	12	-.14360358	05	.100	00	-.0001
175732	60	12	-.14110288	05	.100	00	.0049
175832	60	12	-.13856711	05	.100	00	.0029
175932	60	12	-.13599702	05	.100	00	.0020
180032	60	12	-.13339329	05	.100	00	.0043
180132	60	12	-.13075660	05	.100	00	.0098
180232	60	12	-.12808755	05	.100	00	-.0034
180332	60	12	-.12538671	05	.100	00	.0044
180432	60	12	-.12265462	05	.100	00	-.0049
180532	60	12	-.11989176	05	.100	00	.0015
180632	60	12	-.11709863	05	.100	00	.0045
180732	60	12	-.11427563	05	.100	00	-.0040
180832	60	12	-.11142316	05	.100	00	-.0089
180932	60	12	-.10854160	05	.100	00	.0021
181032	60	12	-.10563128	05	.100	00	-.0134

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(e) Case 16: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

DATA STATISTICS — STATION 12 — ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-181032	61	.510-02	.518-02	-.893-03	.268-04

STATION NUMBER 61 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3
171031	60	12		-.16016061 05 .114 00 .0099
171131	60	12		-.16183780 05 .114 00 .0034
171231	60	12		-.16331456 05 .114 00 .0049
171331	60	12		-.16459986 05 .115 00 -.0068
171431	60	12		-.16570228 05 .115 00 -.0063
171531	60	12		-.16663009 05 .115 00 -.0007
171631	60	12		-.16739121 05 .116 00 -.0046
171731	60	12		-.16799320 05 .116 00 -.0059
171831	60	12		-.16844330 05 .117 00 .0039
171931	60	12		-.16874843 05 .118 00 .0085
172031	60	12		-.16891516 05 .118 00 -.0020
172131	60	12		-.16894976 05 .119 00 .0081
172231	60	12		-.16885820 05 .119 00 -.0066
172331	60	12		-.16864615 05 .120 00 .0051
172431	60	12		-.16831901 05 .121 00 -.0007
172531	60	12		-.16788189 05 .122 00 .0127
172631	60	12		-.16733965 05 .123 00 .0139
172731	60	12		-.16669690 05 .123 00 .0137
172831	60	12		-.16595800 05 .124 00 .0073
173231	60	12		-.16212068 05 .128 00 .0084
173331	60	12		-.16095903 05 .129 00 .0096
173431	60	12		-.15972303 05 .131 00 .0016
173531	60	12		-.15841568 05 .132 00 .0084
173631	60	12		-.15703980 05 .134 00 .0039
173731	60	12		-.15559807 05 .135 00 .0055
173831	60	12		-.15409300 05 .137 00 -.0012

DATA STATISTICS — STATION 61 — ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.634-02	.730-02	.362-02	.532-04

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(f) Case 17: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

```
ITERATION  NUMBER     1      EPOCH  66/08/14  163152.013    CLOCK  L25140    SOS  .18497 03    QSOS  .18497 03

  X   20570611324215254232102 2      Y   21367651555216067327056 1      Z   21255107774315750622034 0
 DX   60173526653254654504067 5     DY   17562512355514366452743 1     DZ   57757751010354430353030 2
000000 23443525422200000000000

Q          DQ          STDEVDQ        APRIORI STDEVDQ        OLD Q          NEW Q          NOMINAL Q       DQ(NOM)

 X    .20502906 00   .17452323 00   .00000000 00    .28179165 02    .28384194 02    .28179165 02    .20502901 00
 Y   -.22210060 00   .30953981 00   .00000000 00    .17868292 04    .17866071 04    .17868292 04   -.22210593 00
 Z    .21611361 00   .75913118 00   .00000000 00    .72203366 03    .72224978 03    .72203366 03    .21611023 00
DX   -.58265997-04   .34048208-03   .00000000 00   -.17708667 01   -.17709249 01   -.17708667 01   -.58263540-04
DY    .23175757-03   .81481664-03   .00000000 00    .19760200 00    .19783376 00    .19760200 00    .23175776-03
DZ    .25611302-05   .11753592-02   .00000000 00   -.37465186 00   -.37464930 00   -.37465186 00    .25592744-05

                                                                DIFFERENCES

                                                               PERICYNTHION

   TIME= 0. HRS
RAD -0.40000000E 03 VEL  0.26654053E 00 GAM -0.11930466E-02 PSI -0.30326843E-03 RAS -0.66862106E-02
DEC  0.83942413E-02 ALT -0.39998438E 03 RDP -0.39450000E 03 SMA -0.13250000E 03 ECC  0.33281744E-04
INC  0.69925785E-02 M M  0.21686554E-02 ASN  0.32196045E-02 AOP -0.82426071E-02 TAN -0.92607457E-04
 DR  0.12191325E 04  DV  0.78403024E 00

                                                                ACQUISITION

   TIME= 0.63333333E 00 HRS
RAD  0.35625000E 02 VEL  0.88439941E-01 GAM  0.21004677E-02 PSI  0.74338913E-02 RAS -0.36163330E-02
DEC -0.23769140E-02 ALT  0.35531250E 02 RDP -0.47375000E 02 SMA  0.46350000E 03 ECC  0.40791929E-04
INC  0.73182583E-02 M M -0.75969696E-02 ASN  0.23841858E-02 AOP  0.55370331E-02 TAN -0.10949373E-03
 DR  0.64000290E 03  DV  0.68863878E 00

                                                                END OF TRACK

   TIME= 0.26333333E 01 HRS
RAD -0.86550000E 03 VEL  0.31326254E 00 GAM -0.25098324E-02 PSI -0.74148178E-02 RAS  0.20103455E-02
DEC -0.95474720E-03 ALT -0.86543750E 03 RDP -0.28287500E 03 SMA -0.22587500E 03 ECC  0.13813376E-04
INC  0.74348450E-02 M M  0.37031174E-02 ASN  0.48828125E-03 AOP -0.13565063E-01 TAN  0.30744076E-03
 DR  0.95078770E 03  DV  0.64844616E 00
```

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(f) Case 17: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 1

	X	Y	Z	DX	DY	DZ
X	.71185492 06	-.44084828 07	-.14834567 07	.61794782 10	-.19102641 10	.74723703 09
Y	-.44084828 07	.51544505 08	.18965666 08	-.74340536 11	.17098823 11	-.11443554 11
Z	-.14834567 07	.18965666 08	.70522665 07	-.27375245 11	.61080157 10	-.42793706 10
DX	.61794782 10	-.74340536 11	-.27375245 11	.10752414 15	-.24410442 14	.16730623 14
DY	-.19102641 10	.17098823 11	.61080157 10	-.24410442 14	.62721551 13	-.34812518 13
DZ	.74723703 09	-.11443554 11	-.42793706 10	.16730623 14	-.34812518 13	.27514848 13

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 1

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.72777841 00	.66208193 00	-.70631760 00	.90403704 00	-.53391980 00
Y	.72777841 00	-.10000000 01	-.99474683 00	.99857692 00	-.95096962 00	.96091770 00
Z	.66208193 00	-.99474683 00	-.10000000 01	.99412427 00	-.91839053 00	.97147579 00
DX	-.70631760 00	.99857692 00	.99412427 00	-.10000000 01	.93997058 00	-.97269249 00
DY	.90403704 00	-.95096962 00	-.91839053 00	.93997058 00	-.10000000 01	.83799896 00
DZ	-.53391980 00	.96091770 00	.97147579 00	-.97269249 00	.83799895 00	-.10000000 01

J INVERSE ITERATION NUMBER 1

	X	Y	Z	DX	DY	DZ
X	.30458359-01	-.46782935-01	.10682837 00	.45879145-04	.12134586-03	-.16213634-03
Y	-.46782935-01	.95814893-01	-.23340861 00	-.10365425-03	-.25186229-03	.35979960-03
Z	.10682837 00	-.23340861 00	.57628015 00	.25786017-03	.61629978-03	-.89166415-03
DX	.45879145-04	-.10365425-03	.25786017-03	.11592805-06	.27462125-06	-.39996560-06
DY	.12134586-03	-.25186229-03	.61629978-03	.27462125-06	.66392615-06	-.95177308-06
DZ	-.16213634-03	.35979960-03	-.89166415-03	-.39996560-06	-.95177308-06	.13814694-05

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(f) Case 17: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 1

	X	Y	Z	DX	DY	DZ
X	.30458359-01	-.46782935-01	.10682837 00	.45879145-04	.12134586-03	-.16213634-03
Y	-.46782935-01	.95814893-01	-.23340861 00	-.10365425-03	-.25185229-03	.35979960-03
Z	.10682837 00	-.23340861 00	.57628015 00	.25786017-03	.61629978-03	-.89166415-03
DX	.45879145-04	-.10365425-03	.25786017-03	.11592805-06	.27462125-06	-.39996560-06
DY	.12134586-03	-.25186229-03	.61629978-03	.27462125-06	.66392615-06	-.95177308-06
DZ	-.16213634-03	.35979960-03	-.89166415-03	-.39996560-06	-.95177308-06	.13814694-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 1

	X	Y	Z	DX	DY	DZ
X	.99999999 00	-.86599962 00	.80633689 00	.77208976 00	.85331979 00	-.79041737 00
Y	-.86599962 00	.10000000 01	-.99330708 00	-.98350451 00	-.99858891 00	.98894818 00
Z	.80633689 00	-.99330708 00	.10000000 01	.99763843 00	.99635772 00	-.99934134 00
DX	.77208976 00	-.98350451 00	.99763843 00	.10000000 01	.98987414 00	-.99944232 00
DY	.85331979 00	-.99858891 00	.99635772 00	.98987414 00	.99999998 00	-.99380892 00
DZ	-.79041737 00	.98894818 00	-.99934134 00	-.99944232 00	-.99380892 00	.10000000 01

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(f) Case 17: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 1 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME	TC	Q	CC3				
H M S							
171032	60	12	-.18991696	05	.100	00	-.2461
171132	60	12	-.19152500	05	.100	00	-.2588
171232	60	12	-.19293140	05	.100	00	-.2510
171332	60	12	-.19414512	05	.100	00	-.2549
171432	60	12	-.19517470	05	.100	00	-.2461
171532	60	12	-.19602838	05	.100	00	-.2451
171632	60	12	-.19671407	05	.100	00	-.2427
171732	60	12	-.19723931	05	.100	00	-.2280
171832	60	12	-.19761133	05	.100	00	-.2173
171932	60	12	-.19783702	05	.100	00	-.2148
172032	60	12	-.19792297	05	.100	00	-.2031
172132	60	12	-.19787543	05	.100	00	-.1934
172232	60	12	-.19770038	05	.100	00	-.1870
172332	60	12	-.19740348	05	.100	00	-.1689
172432	60	12	-.19699012	05	.100	00	-.1709
172532	60	12	-.19646544	05	.100	00	-.1563
172632	60	12	-.19583429	05	.100	00	-.1465
172732	60	12	-.19510127	05	.100	00	-.1396
172832	60	12	-.19427077	05	.100	00	-.1309
172932	60	12	-.19334695	05	.100	00	-.1304
173032	60	12	-.19233372	05	.100	00	-.1113
173132	60	12	-.19123483	05	.100	00	-.1089
173232	60	12	-.19005379	05	.100	00	-.0964
173332	60	12	-.18879394	05	.100	00	-.0889
173432	60	12	-.18745847	05	.100	00	-.0867
173532	60	12	-.18605037	05	.100	00	-.0796
173632	60	12	-.18457247	05	.100	00	-.0696
173732	60	12	-.18302746	05	.100	00	-.0627
173832	60	12	-.18141787	05	.100	00	-.0630
173932	60	12	-.17974612	05	.100	00	-.0552
174032	60	12	-.17801447	05	.100	00	-.0449
174132	60	12	-.17622507	05	.100	00	-.0432
174232	60	12	-.17437996	05	.100	00	-.0376
174332	60	12	-.17248105	05	.100	00	-.0286
174432	60	12	-.17053016	05	.100	00	-.0342
174532	60	12	-.16852901	05	.100	00	-.0244
174632	60	12	-.16647921	05	.100	00	-.0205
174732	60	12	-.16438230	05	.100	00	-.0203
174832	60	12	-.16223972	05	.100	00	-.0195
174932	60	12	-.16005284	05	.100	00	-.0079
H M S							
175032	60	12	-.15782293	05	.100	00	-.0150
175132	60	12	-.15555123	05	.100	00	-.0104
175232	60	12	-.15323887	05	.100	00	-.0131
175332	60	12	-.15088692	05	.100	00	-.0081
175432	60	12	-.14849640	05	.100	00	-.0096
175532	60	12	-.14606828	05	.100	00	-.0056
175632	60	12	-.14360343	05	.100	00	-.0150
175732	60	12	-.14110273	05	.100	00	-.0105
175832	60	12	-.13856695	05	.100	00	-.0135
175932	60	12	-.13599684	05	.100	00	-.0157
180032	60	12	-.13339310	05	.100	00	-.0150
180132	60	12	-.13075639	05	.100	00	-.0107
180232	60	12	-.12808733	05	.100	00	-.0254
180332	60	12	-.12538647	05	.100	00	-.0198
180432	60	12	-.12265436	05	.100	00	-.0309
180532	60	12	-.11989149	05	.100	00	-.0261
180632	60	12	-.11709833	05	.100	00	-.0254
180732	60	12	-.11427531	05	.100	00	-.0358
180832	60	12	-.11142282	05	.100	00	-.0426
180932	60	12	-.10854124	05	.100	00	-.0338
181032	60	12	-.10563391	05	.100	00	-.0510
181132	60	12	-.10269213	05	.100	00	-.0452
181232	60	12	-.99725202	04	.100	00	-.0547
181332	60	12	-.96730377	04	.100	00	-.0540
181432	60	12	-.93707895	04	.100	00	-.0604
181532	60	12	-.90657972	04	.100	00	-.0696
181632	60	12	-.87580808	04	.100	00	-.0609
181832	60	12	-.81345411	04	.100	00	-.0754
181932	60	12	-.78187462	04	.100	00	-.0789
182032	60	12	-.75002859	04	.100	00	-.0808
182132	60	12	-.71791676	04	.100	00	-.0908
182232	60	12	-.68554014	04	.100	00	-.0903
182332	60	12	-.65289945	04	.100	00	-.0972
182432	60	12	-.61999517	04	.100	00	-.0984
182532	60	12	-.58682771	04	.100	00	-.1062
182632	60	12	-.55339742	04	.100	00	-.1008
182732	60	12	-.51970447	04	.100	00	-.1135
182832	60	12	-.48574897	04	.100	00	-.1187
182932	60	12	-.45153080	04	.100	00	-.1169
183032	60	12	-.41704991	04	.100	00	-.1177
183132	60	12	-.38230610	04	.100	00	-.1223
183232	60	12	-.34729907	04	.100	00	-.1177
183332	60	12	-.31202853	04	.100	00	-.1313

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Continued

(f) Case 17: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

H M S							
184332	60	12	.55270283	03	.100	00	-.1279
184432	60	12	.93469714	03	.100	00	-.1304
184532	60	12	.13193777	04	.100	00	-.1279
184632	60	12	.17067455	04	.100	00	-.1206
184732	60	12	.20968004	04	.100	00	-.1172
184832	60	12	.24895417	04	.100	00	-.1084
184932	60	12	.28849651	04	.100	00	-.1150
185032	60	12	.32830659	04	.100	00	-.1077
185132	60	12	.36838370	04	.100	00	-.0955
185232	60	12	.40872685	04	.100	00	-.0935
185332	60	12	.44933477	04	.100	00	-.0894
185432	60	12	.49020588	04	.100	00	-.0754
185532	60	12	.53133831	04	.100	00	-.0667
185632	60	12	.57272972	04	.100	00	-.0640
185732	60	12	.61437743	04	.100	00	-.0494
190332	60	12	.86942621	04	.100	00	.0046
190432	60	12	.91274489	04	.100	00	.0343
190532	60	12	.95627618	04	.100	00	.0382
190632	60	12	.10000110	05	.100	00	.0481
190732	60	12	.10439391	05	.100	00	.0679
190832	60	12	.10880488	05	.100	00	.0784
190932	60	12	.11323276	05	.100	00	.0911
191032	60	12	.11767610	05	.100	00	.1064

DATA STATISTICS STATION 12 ITERATION 1

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-191032	136	.774-01	.112 00	-.810-01	.126-01

TABLE XII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = 0 - Concluded

(f) Case 17: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 1 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC3	C3	
171031	60	12		-.16015828 05 .114 00	-.2231
171131	60	12		-.16183544 05 .114 00	-.2324
171231	60	12		-.16331220 05 .114 00	-.2314
171331	60	12		-.16459751 05 .115 00	-.2417
171431	60	12		-.16569996 05 .115 00	-.2388
171531	60	12		-.16662781 05 .115 00	-.2285
171631	60	12		-.16738900 05 .116 00	-.2266
171731	60	12		-.16799106 05 .116 00	-.2207
171831	60	12		-.16844123 05 .117 00	-.2031
171931	60	12		-.16874644 05 .118 00	-.1904
172031	60	12		-.16891326 05 .118 00	-.1919
172131	60	12		-.16894795 05 .119 00	-.1733
172231	60	12		-.16885649 05 .119 00	-.1777
172331	60	12		-.16864454 05 .120 00	-.1558
172431	60	12		-.16831749 05 .121 00	-.1523
172531	60	12		-.16788047 05 .122 00	-.1294
172631	60	12		-.16733832 05 .123 00	-.1189
172731	60	12		-.16669567 05 .123 00	-.1094
172831	60	12		-.16595686 05 .124 00	-.1064
173231	60	12		-.16211989 05 .128 00	-.0710
173331	60	12		-.16095830 05 .129 00	-.0630
173431	60	12		-.15972238 05 .131 00	-.0635
173531	60	12		-.15841510 05 .132 00	-.0498
173631	60	12		-.15703928 05 .134 00	-.0480
173731	60	12		-.15559760 05 .135 00	-.0406
173831	60	12		-.15409259 05 .137 00	-.0419

DATA STATISTICS STATION 61 ITERATION 1

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.707-01	.167 00	-.151 00	.278-01

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC)

(a) Case 18: 10-minute arc of 2- and 3-way tracking

ITERATION NUMBER 5 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .28058-01 QSOS .28058-01

X	20571653215015202423266 1	Y	21367644712316034134356 4	Z	21255124044715705365570 4
DX	60170527667454620550322 4	DY	17662612511614365540223 4	DZ	57757761247754453415141 1
000000	23443525422200000000000 0				

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.12555387-01	.66970856 01	.00000000 00	.28929816 02	.28917261 02	.31679165 02	-.27619037 01
Y	.95711995-02	.36479430 01	.00000000 00	.17862964 04	.17863059 04	.17898292 04	-.35232391 01
Z	-.68318486-02	.52705203 01	.00000000 00	.72263408 03	.72262724 03	.72503366 03	-.24064178 01
DX	.13379998-04	.29706748-02	.00000000 00	-.17710008 01	-.17709874 01	-.17678667 01	-.31207651-02
DY	.31797510-05	.46419876-02	.00000000 00	.19832022 00	.19832340 00	.20060200 00	-.22786036-02
DZ	-.28035275-04	.60406552-02	.00000000 00	-.37474809 00	-.37477612 00	-.37165186 00	-.31242631-02

DIFFERENCES

PERICYNTHION

TIME= [illegible] HRS

RAD -[illegible] VEL [illegible] GAM -[illegible] PSI [illegible] RAS -[illegible]
DEC [illegible] ALT -[illegible] ROP -[illegible] SMA [illegible] ECC [illegible]
INC [illegible] ASN -[illegible] ARP -[illegible] TAN -[illegible]
DR [illegible] DV [illegible]

ACQUISITION

TIME= [illegible] HRS

RAD -[illegible] VEL [illegible] GAM [illegible] PSI [illegible] RAS -[illegible]
DEC -[illegible] ALT -[illegible] ROP -[illegible] SMA [illegible] ECC [illegible]
INC [illegible] ASN -[illegible] ARP [illegible] TAN -[illegible]
DR [illegible] DV [illegible]

END OF TRACK

TIME= [illegible] HRS

RAD [illegible] VEL [illegible] GAM [illegible] PSI [illegible] RAS -[illegible]
DEC -[illegible] ALT [illegible] ROP -[illegible] SMA [illegible] ECC [illegible]
INC [illegible] ASN -[illegible] ARP [illegible] TAN -[illegible]
DR [illegible] DV [illegible]

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(a) Case 18: 10-minute arc of 2- and 3-way tracking

J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.22033136 06	-.42784258 06	-.66751726 05	.51182926 09	-.39363123 09	-.28620519 08
Y	-.42784258 06	.83089787 06	.12970391 06	-.99337316 09	.76449761 09	.55847749 08
Z	-.66751726 05	.12970391 06	.20302391 05	-.15458229 09	.11937613 09	.89237803 07
DX	.51182926 09	-.99337316 09	-.15458229 09	.11919598 13	-.91365704 12	-.64925807 11
DY	-.39363123 09	.76449761 09	.11937613 09	-.91365704 12	.70343461 12	.51527807 11
DZ	-.28620519 08	.55847749 08	.89237803 07	-.64925807 11	.51527807 11	.45367915 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99993559 00	.99804646 00	-.99874856 00	.99986076 00	.90524254 00
Y	.99993559 00	-.10000000 01	-.99863243 00	.99817755 00	-.99997800 00	-.90961464 00
Z	.99804646 00	-.99863243 00	-.10000000 01	.99370017 00	-.99892307 00	-.92982426 00
DX	-.99874856 00	.99817755 00	.99370017 00	-.10000000 01	.99779321 00	.88290129 00
DY	.99986076 00	-.99997800 00	-.99892307 00	.99779321 00	-.10000000 01	-.91212716 00
DZ	.90524254 00	-.90961464 00	-.92982426 00	.88290129 00	-.91212716 00	-.10000000 01

J INVERSE ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.44717113 02	-.23589383 02	.34195649 02	-.13252871-01	.26948966-01	.94806993-02
Y	-.23589383 02	.13307488 02	-.17412346 02	.87971817-02	-.12570000-01	-.97163451-02
Z	.34195649 02	-.17412346 02	.27778384 02	-.80559374-02	.22769127-01	.15358743-02
DX	-.13252871-01	.87971817-02	-.80559374-02	.88249091-05	-.29907715-05	-.15792045-04
DY	.26948966-01	-.12570000-01	.22769127-01	-.29907715-05	.21548049-04	-.75800396-05
DZ	.94806993-02	-.97163451-02	.15358743-02	-.15792045-04	-.75800396-05	.36489515-04

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(a) Case 18: 10-minute arc of 2- and 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.44717113 02	-.23589383 02	.34195649 02	-.13252871-01	.26948966-01	.94806993-02
Y	-.23589383 02	.13307488 02	-.17412346 02	.87971817-02	-.12570000-01	-.97163451-02
Z	.34195649 02	-.17412346 02	.27778384 02	-.80559374-02	.22769127-01	.15358743-02
DX	-.13252871-01	.87971817-02	-.80559374-02	.88249091-05	-.29907715-05	-.15792045-04
DY	.26948966-01	-.12570000-01	.22769127-01	-.29907715-05	.21548049-04	-.75800396-05
DZ	.94806993-02	-.97163451-02	.15358743-02	-.15792045-04	-.75800396-05	.36489515-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.99999998 00	-.96701152 00	.97024289 00	-.66714154 00	.86816293 00	.23470343 00
Y	-.96701152 00	.10000000 01	-.90564033 00	.81178384 00	-.74230647 00	-.44093122 00
Z	.97024289 00	-.90564033 00	.10000000 01	-.51452617 00	.93065540 00	.48241202-01
DX	-.66714154 00	.81178384 00	-.51452617 00	.10000000 01	-.21688231 00	-.88003347 00
DY	.86816293 00	-.74230647 00	.93065540 00	-.21688231 00	.99999997 00	-.27032328 00
DZ	.23470343 00	-.44093122 00	.48241202-01	-.88003347 00	-.27032328 00	.10000000 01

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(a) Case 18: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	
171032	60 12	-.18991941 05 .100 00		-.0002
171132	60 12	-.19152752 05 .100 00		-.0061
171232	60 12	-.19293396 05 .100 00		.0049
171332	60 12	-.19414767 05 .100 00		.0005
171432	60 12	-.19517722 05 .100 00		.0051
171532	60 12	-.19603084 05 .100 00		.0010
171632	60 12	-.19671646 05 .100 00		-.0037
171732	60 12	-.19724161 05 .100 00		.0024
171832	60 12	-.19761353 05 .100 00		.0032
171932	60 12	-.19783914 05 .100 00		-.0032
172032	60 12	-.19792499 05 .100 00		-.0007

DATA STATISTICS STATION 12 ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-172032	11	.341-02	.342-02	.289-03	.117-04

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(a) Case 18: 10-minute arc of 2- and 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
171031	60	12		-.16016054 05 .114 00	.0028
171131	60	12		-.16183777 05 .114 00	.0011
171231	60	12		-.16331457 05 .114 00	.0057
171331	60	12		-.16459988 05 .115 00	-.0051
171431	60	12		-.16570231 05 .115 00	-.0037
171531	60	12		-.16663011 05 .115 00	.0015
171631	60	12		-.16739122 05 .116 00	-.0037
171731	60	12		-.16799321 05 .116 00	-.0051
171831	60	12		-.16844331 05 .117 00	.0042
171931	60	12		-.16874842 05 .118 00	.0078
172031	60	12		-.16891516 05 .118 00	-.0020

DATA STATISTICS STATION 61 ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172031	11	.431-02	.432-02	.322-03	.187-04

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(b) Case 19: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

ITERATION NUMBER 5 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .82776-01 QSOS .82776-01

X	20571221126415271350615 3	Y	21367646016216033664147 1	Z	21255113103615707014652 4
DX	60170531601454676660016 2	DY	17662532346114320225473 6	DZ	57757723067054412474534 0
000000	23443525422200000000000				

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	.79764539-03	.14120436 01	.00000000 00	.28640969 02	.28641766 02	.31679165 02	-.30373983 01
Y	.40762118-04	.86006065 00	.00000000 00	.17863767 04	.17863767 04	.17898292 04	-.34524536 01
Z	-.42899026-03	.12411980 01	.00000000 00	.72234831 03	.72234788 03	.72503366 03	-.26857834 01
DX	-.14198227-06	.92614899-03	.00000000 00	-.17711029 01	-.17711031 01	-.17678667 01	-.32363981-02
DY	.26758537-06	.17664535-02	.00000000 00	.19795543 00	.19795570 00	.20060200 00	-.26462990-02
DZ	.40078331-06	.26079446-02	.00000000 00	-.37431539 00	-.37431499 00	-.37165186 00	-.26631355-02

DIFFERENCES

PERICYNTHION

TIME= 0. HRS

RAD	-0.967325[illegible]E 03	VEL	[illegible]617E 00	GAM	-0.2555[illegible]E-02	PSI	-0.12823[illegible]E-01	RAS	-0.15[illegible]2332E-01		
DEC	0.1361[illegible]E-01	ALT	-0.95757[illegible]E 03	RDP	-0.9559375[illegible]E 03	SMA	-0.2731250[illegible]E 03	ECC	0.84314495E-04		
INC	0.5[illegible]E-02	[illegible]	0.44679[illegible]E-02	ASN	.2[illegible]96344E-01	ARP	-0.3428077[illegible]E-01	TAN	-0.19963644E-03		
DR	0.2[illegible]1E 04	DV	0.17[illegible]3642E 01								

ACQUISITION

TIME= .63333333E [illegible] HRS

RAD	-0.117[illegible]	VEL	0.13299561E 0[illegible]	GAM	0.5182[illegible]278E-02	PSI	0.10615349E-01	RAS	0.1344[illegible]8E-02		
DEC	0.5[illegible]3367E-02	ALT	-0.117[illegible]E 03	RDP	-0.6[illegible]3750[illegible]E 03	SMA	0.321[illegible]E 03	ECC	0.91705471E-04		
INC	0.[illegible]744[illegible]E-02	[illegible]	-0.5[illegible]E-02	ASN	0.2526[illegible]925E-01	ARP	-0.2293[illegible]875E-02	TAN	-0.8873641[illegible]E-[illegible]		
DR	0.0[illegible]648[illegible] 02	DV	0.85[illegible]								

END OF TRACK

TIME= .5[illegible]666666E [illegible] HRS

RAD	0.235125[illegible]E 03	VEL	-0.49[illegible]2265E-01	GAM	.28083324E-02	PSI	0.12610435E-01	RAS	-0.15468597E-02		
DEC	-0.3 934125E-03	ALT	.2531250[illegible]E 03	RDP	-0.2531250[illegible]E 03	SMA	0.1996250[illegible]E 03	ECC	0.43559819E-04		
INC	0.5[illegible]34E-02	[illegible]	-0.3273[illegible]3E-02	ASN	.24871826E-01	ARP	-0.113[illegible]2948E-01	TAN	-0.63[illegible]76615E-04		
DR	0.3512546E 03	DV	0.84[illegible]5365E 0[illegible]								

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(b) Case 19: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.30904449 06	-.58933666 06	-.84200574 05	.74846019 09	-.54357822 09	-.22372980 08
Y	-.58933666 06	.11252108 07	.16174341 06	-.14237730 10	.10375796 10	.44773537 08
Z	-.84200574 05	.16174341 06	.23974770 05	-.20076397 09	.14897314 09	.79717051 07
DX	.74846019 09	-.14237730 10	-.20076397 09	.18238142 13	-.13135025 13	-.47791971 11
DY	-.54357822 09	.10375796 10	.14897314 09	-.13135025 13	.95690894 12	.41073396 11
DZ	-.22372980 08	.44773537 08	.79717051 07	-.47791971 11	.41073396 11	.53182489 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99939231 00	.97819926 00	-.99693747 00	.99957698 00	.55186011 00
Y	.99939231 00	-.10000000 01	-.98476458 00	.99387899 00	-.99992904 00	-.57878879 00
Z	.97819926 00	-.98476458 00	-.10000000 01	.96010396 00	-.98354777 00	-.70597556 00
DX	-.99693747 00	.99387899 00	.96010396 00	-.10000000 01	.99427225 00	.48526651 00
DY	.99957698 00	-.99992904 00	-.98354777 00	.99427225 00	-.10000000 01	-.57575932 00
DZ	.55186011 00	-.57878879 00	-.70597556 00	.48526651 00	-.57575932 00	-.99999999 00

J INVERSE ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.19938672 01	-.10784316 01	.12507765 01	-.14905437-03	.19310120-02	-.66068722-03
Y	-.10784316 01	.73970432 00	-.71143919 00	.24031940-03	-.97303884-03	-.23349109-04
Z	.12507765 01	-.71143919 00	.15405726 01	.58014323-03	.21403506-02	-.23746581-02
DX	-.14905437-03	.24031940-03	.58014323-03	.85775196-06	.84076737-06	-.23050793-05
DY	.19310120-02	-.97303884-03	.21403506-02	.84076737-06	.31203579-05	-.34363054-05
DZ	-.66068722-03	-.23349109-04	-.23746581-02	-.23050793-05	-.34363054-05	.68013752-05

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(b) Case 19: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.19938672 01	-.10784316 01	.12507765 01	-.14905437-03	.19310120-02	-.66068722-03
Y	-.10784316 01	.73970432 00	-.71143919 00	.24031940-03	-.97303884-03	-.23349109-04
Z	.12507765 01	-.71143919 00	.15405726 01	.58014323-03	.21403506-02	-.23746581-02
DX	-.14905437-03	.24031940-03	.58014323-03	.85775196-06	.84076737-06	-.23050793-05
DY	.19310120-02	-.97303884-03	.21403506-02	.84076737-06	.31203579-05	-.34363054-05
DZ	-.66068722-03	-.23349109-04	-.23746581-02	-.23050793-05	-.34363054-05	.68013752-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.99999999 00	-.88800502 00	.71365863 00	-.11397660 00	.77416702 00	-.17941115 00
Y	-.88800502 00	.99999998 00	-.66645007 00	.30170248 00	-.64047014 00	-.10409811-01
Z	.71365863 00	-.66645007 00	.10000000 01	.50467674 00	.97620632 00	-.73360389 00
DX	-.11397660 00	.30170248 00	.50467674 00	.99999999 00	.51391675 00	-.95434773 00
DY	.77416702 00	-.64047014 00	.97620632 00	.51391675 00	.99999999 00	-.74591816 00
DZ	-.17941115 00	-.10409811-01	-.73360389 00	-.95434773 00	-.74591816 00	.10000000 01

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(b) Case 19: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3
171032	60 12	-.18991940 05 .100 00	-.0012
171132	60 12	-.19152749 05 .100 00	-.0088
171232	60 12	-.19293393 05 .100 00	.0020
171332	60 12	-.19414765 05 .100 00	-.0015
171432	60 12	-.19517721 05 .100 00	.0042
171532	60 12	-.19603084 05 .100 00	.0007
171632	60 12	-.19671647 05 .100 00	-.0027
171732	60 12	-.19724163 05 .100 00	.0051
171832	60 12	-.19761357 05 .100 00	.0066
171932	60 12	-.19783916 05 .100 00	-.0002
172032	60 12	-.19792502 05 .100 00	.0022
172132	60 12	-.19787738 05 .100 00	.0049
172232	60 12	-.19770223 05 .100 00	-.0022
172332	60 12	-.19740522 05 .100 00	.0059
172432	60 12	-.19699178 05 .100 00	-.0056
172532	60 12	-.19646699 05 .100 00	-.0010
172632	60 12	-.19583574 05 .100 00	-.0005
172732	60 12	-.19510265 05 .100 00	-.0017
172832	60 12	-.19427207 05 .100 00	-.0012
172932	60 12	-.19334817 05 .100 00	-.0081
173032	60 12	-.19233488 05 .100 00	.0042

DATA STATISTICS STATION 12 ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-173032	21	.418-02	.418-02	.465-04	.175-04

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(b) Case 19: 20-minute arc of 2-way tracking with 18 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
171031	60	12		-.16016059 05 .114 00	.0077
171131	60	12		-.16183779 05 .114 00	.0031
171231	60	12		-.16331457 05 .114 00	.0061
171331	60	12		-.16459987 05 .115 00	-.0054
171431	60	12		-.16570230 05 .115 00	-.0044
171531	60	12		-.16663010 05 .115 00	.0002
171631	60	12		-.16739122 05 .116 00	-.0042
171731	60	12		-.16799320 05 .116 00	-.0066
171831	60	12		-.16844328 05 .117 00	.0022
171931	60	12		-.16874840 05 .118 00	.0051
172031	60	12		-.16891512 05 .118 00	-.0063
172131	60	12		-.16894970 05 .119 00	.0024
172231	60	12		-.16885814 05 .119 00	-.0127
172331	60	12		-.16864608 05 .120 00	-.0015
172431	60	12		-.16831894 05 .121 00	-.0071
172531	60	12		-.16788182 05 .122 00	.0056
172631	60	12		-.16733959 05 .123 00	.0073
172731	60	12		-.16669684 05 .123 00	.0073
172831	60	12		-.16595795 05 .124 00	.0024

DATA STATISTICS STATION 61 ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-172831	19	.585-02	.585-02	.771-04	.342-04

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5Km; 3M/SEC) - Continued

(c) Case 20: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

ITERATION NUMBER 5 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .10614 00 QSOS .10614 00

X 20571034166215224251112 7 Y 21367646715416077634426 1 Z 21255111012015770304751 5
DX 60170531516154647312571 0 DY 17662514316114336616440 5 DZ 57757720273554431115537 7
000000 23443525422200000000000 0

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.22554523-02	.63004074 00	.00000000 00	.28529825 02	.28527569 02	.31679165 02	-.31515956 01
Y	.49855630-03	.55043004 00	.00000000 00	.17864308 04	.17864313 04	.17898292 04	-.33978577 01
Z	-.23718505-02	.82389943 00	.00000000 00	.72228423 03	.72228186 03	.72503366 03	-.27518082 01
DX	-.19950043-05	.54229416-03	.00000000 00	-.17710949 01	-.17710970 01	-.17678667 01	-.32302737-02
DY	-.44833485-05	.10339015-02	.00000000 00	.19785301 00	.19784853 00	.20060200 00	-.27534682-02
DZ	.64449281-05	.15671620-02	.00000000 00	-.37427961 00	-.37427317 00	-.37165186 00	-.26213117-02

DIFFERENCES

PERICYNTHION

TIME= [illegible] HRS
RAD -[illegible] VEL [illegible].56726074E 00 GAM -[illegible].13826337E-02 PSI -0.13816833E-01 RAS -0.11372566E-01
DEC [illegible].11[illegible]95E-01 ALT -[illegible].88621[illegible]94E 03 RDP -[illegible].88212576E 03 SMA -[illegible].43450[illegible]E 03 ECC 0.63821673E-04
INC [illegible].28[illegible]42793E-02 M M [illegible].71115957E-02 ASN [illegible].29148132E-01 ANP -.35639763E-01 TAN -0.10382663E-03
DR [illegible].19167169E 04 DV [illegible].16639552E 01

ACQUISITION

TIME= [illegible].63333333E 00 HRS
RAD -0.74125[illegible]E-02 VEL [illegible].74[illegible]1875[illegible]E-01 GAM [illegible].41179657E-02 PSI [illegible].89416504E-02 RAS [illegible].28991699E-02
DEC 0.74799[illegible]61E-02 ALT -[illegible].741[illegible]E 02 RDP -[illegible].53462590E 03 SMA [illegible].16[illegible]1250[illegible]E 03 ECC 0.71171671E-04
INC 0.31330585E-02 M M -[illegible].25245117E-02 ASN [illegible].28312643E-01 ANP -.64239502E-02 TAN -0.36075711E-04
DR 0.12[illegible]9243E 04 DV [illegible].64389735E 00

END OF TRACK

TIME= [illegible].11333333E 01 HRS
RAD [illegible].192125[illegible]E 03 VEL -[illegible].9[illegible]1514E-01 GAM -.26690[illegible]E-03 PSI [illegible].12774467E-01 RAS -0.12664795E-02
DEC -0.14877319E-03 ALT [illegible].192125[illegible]E 03 RDP -0.17136250E 03 SMA -[illegible].6125[illegible] E 02 ECC 0.12673438E-04
INC 0.29587881E-02 M M [illegible].13179779E-02 ASN [illegible].27698517E-01 ANP -0.22321674E-01 TAN 0.10348111E-03
DR 0.27145005E 03 DV 0.76254967E 00

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(c) Case 20: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.32924315 06	-.61336326 06	-.79374183 05	.80374577 09	-.57346620 09	-.15282767 08
Y	-.61336326 06	.11575029 07	.15838639 06	-.14907199 10	.10741492 10	.37298172 08
Z	-.79374183 05	.15838639 06	.26664594 05	-.18829103 09	.14248305 09	.10292851 08
DX	.80374577 09	-.14907199 10	-.18829103 09	.19756027 13	-.13956634 13	-.28648195 11
DY	-.57346620 09	.10741492 10	.14248305 09	-.13956634 13	.10014036 13	.30831528 11
DZ	-.15282767 08	.37298172 08	.10292851 08	-.28648195 11	.30831528 11	.80755284 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99356974 00	.84713653 00	-.99657623 00	.99872263 00	.29638632 00
Y	.99356974 00	-.10000000 01	-.90154903 00	.98579183 00	-.99769785 00	-.38578119 00
Z	.84713653 00	-.90154903 00	-.10000000 01	.82037485 00	-.87194916 00	-.70142743 00
DX	-.99657623 00	.98579183 00	.82037485 00	-.10000000 01	.99226192 00	.22680989 00
DY	.99872263 00	-.99769785 00	-.87194916 00	.99226192 00	-.10000000 01	-.34285067 00
DZ	.29638632 00	-.38578119 00	-.70142743 00	.22680989 00	-.34285067 00	-.10000000 01

J INVERSE ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.39695133 00	-.28002561 00	.28305629 00	-.31370981-04	.44792846-03	-.13764286-03
Y	-.28002561 00	.30297324 00	-.32701337 00	.38258875-04	-.38880751-03	.10767878-03
Z	.28305629 00	-.32701337 00	.67881028 00	.26352143-03	.81410984-03	-.99248561-03
DX	-.31370981-04	.38258875-04	.26352143-03	.29408297-06	.33866565-06	-.82167277-06
DY	.44792846-03	-.38880751-03	.81410984-03	.33866565-06	.10689524-05	-.12738970-05
DZ	-.13764286-03	.10767878-03	-.99248561-03	-.82167277-06	-.12738970-05	.24559966-05

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(c) Case 20: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.39695133 00	-.28002561 00	.28305629 00	-.31370981-04	.44792846-03	-.13764286-03
Y	-.28002561 00	.30297324 00	-.32701337 00	.38258875-04	-.38880751-03	.10767878-03
Z	.28305629 00	-.32701337 00	.67881028 00	.26352143-03	.81410984-03	-.99248561-03
DX	-.31370981-04	.38258875-04	.26352143-03	.29408297-06	.33866565-06	-.82167277-06
DY	.44792846-03	-.38880751-03	.81410984-03	.33866565-06	.10689524-05	-.12738970-05
DZ	-.13764286-03	.10767878-03	-.99248561-03	-.82167277-06	-.12738970-05	.24559966-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.80747111 00	.54529306 00	-.91817306-01	.68763955 00	-.13940270 00
Y	-.80747111 00	.10000000 01	-.72108950 00	.12817258 00	-.68320860 00	.12482860 00
Z	.54529306 00	-.72108950 00	.10000000 01	.58980276 00	.95571768 00	-.76866326 00
DX	-.91817306-01	.12817258 00	.58980276 00	.10000000 01	.60402794 00	-.96682990 00
DY	.68763955 00	-.68320860 00	.95571768 00	.60402794 00	.99999999 00	-.78621485 00
DZ	-.13940270 00	.12482860 00	-.76866326 00	-.96682990 00	-.78621485 00	.99999999 00

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(c) Case 20: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3				
171032	60	12	-.18991942	05	.100	00	.0002
171132	60	12	-.19152749	05	.100	00	-.0090
171232	60	12	-.19293392	05	.100	00	.0010
171332	60	12	-.19414763	05	.100	00	-.0032
171432	60	12	-.19517718	05	.100	00	.0017
171532	60	12	-.19603082	05	.100	00	-.0012
171632	60	12	-.19671645	05	.100	00	-.0044
171732	60	12	-.19724162	05	.100	00	.0034
171832	60	12	-.19761356	05	.100	00	.0061
171932	60	12	-.19783917	05	.100	00	.0005
172032	60	12	-.19792503	05	.100	00	.0032
172132	60	12	-.19787740	05	.100	00	.0063
172232	60	12	-.19770225	05	.100	00	-.0002
172332	60	12	-.19740525	05	.100	00	.0083
172432	60	12	-.19699180	05	.100	00	-.0037
172532	60	12	-.19646701	05	.100	00	.0012
172632	60	12	-.19583576	05	.100	00	.0010
172732	60	12	-.19510265	05	.100	00	-.0010
172832	60	12	-.19427207	05	.100	00	-.0015
172932	60	12	-.19334816	05	.100	00	-.0093
173032	60	12	-.19233484	05	.100	00	.0007
173132	60	12	-.19123586	05	.100	00	-.0051
173232	60	12	-.19005475	05	.100	00	-.0000
173332	60	12	-.18879484	05	.100	00	.0005
173432	60	12	-.18745929	05	.100	00	-.0042
173532	60	12	-.18605113	05	.100	00	-.0034
173632	60	12	-.18457317	05	.100	00	.0007
173732	60	12	-.18302810	05	.100	00	.0022
173832	60	12	-.18141847	05	.100	00	-.0029
173932	60	12	-.17974667	05	.100	00	.0002
174032	60	12	-.17801498	05	.100	00	.0061

DATA STATISTICS STATION 12 ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-174032	31	.400-02	.400-02	-.181-03	.160-04

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(c) Case 20: 30-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 61 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3			
171031	60	12		-.16016061	05	.114 00	.0095
171131	60	12		-.16183779	05	.114 00	.0031
171231	60	12		-.16331457	05	.114 00	.0055
171331	60	12		-.16459986	05	.115 00	-.0068
171431	60	12		-.16570227	05	.115 00	-.0071
171531	60	12		-.16663008	05	.115 00	-.0017
171631	60	12		-.16739120	05	.116 00	-.0066
171731	60	12		-.16799319	05	.116 00	-.0076
171831	60	12		-.16844328	05	.117 00	.0015
171931	60	12		-.16874840	05	.118 00	.0051
172031	60	12		-.16891512	05	.118 00	-.0059
172131	60	12		-.16894971	05	.119 00	.0034
172231	60	12		-.16885814	05	.119 00	-.0120
172331	60	12		-.16864609	05	.120 00	-.0002
172431	60	12		-.16831895	05	.121 00	-.0066
172531	60	12		-.16788183	05	.122 00	.0066
172631	60	12		-.16733959	05	.123 00	.0073
172731	60	12		-.16669683	05	.123 00	.0068
172831	60	12		-.16595793	05	.124 00	.0005
173231	60	12		-.16212062	05	.128 00	.0020
173331	60	12		-.16095836	05	.129 00	.0033
173431	60	12		-.15972297	05	.131 00	-.0042
173531	60	12		-.15841562	05	.132 00	.0027
173631	60	12		-.15703975	05	.134 00	-.0013
173731	60	12		-.15559802	05	.135 00	.0009
173831	60	12		-.15409296	05	.137 00	-.0049

DATA STATISTICS STATION 61 ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.555-02	.555-02	-.258-03	.308-04

TABLE XIII .- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(d) Case 21: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

ITERATION NUMBER 5 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .12612 00 QSOS .12612 00

X 2C5707704306152606567775 Y 2136764714521606342272 65 Z 2125511047721575337317 37
DX 601705314140546620735341 DY 176625107002143227342175 DZ 577577205463544225104305
000000 2344352542220000000000000

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.25392874-02	.42619305 00	.00000000 00	.28495262 02	.28492723 02	.31679165 02	-.31864419 01
Y	.93257643-03	.50197022 00	.00000000 00	.17864489 04	.17864498 04	.17898292 04	-.33793335 01
Z	-.10536071-02	.79708968 00	.00000000 00	.72227053 03	.72226948 03	.72503366 03	-.27641830 01
DX	-.31470507-06	.52664388-03	.00000000 00	-.17710888 01	-.17710891 01	-.17678667 01	-.32223910-02
DY	-.27984584-05	.93508418-03	.00000000 00	.19782442 00	.19782162 00	.20060200 00	-.27803778-02
DZ	.17828683-05	.15291513-02	.00000000 00	-.37428004 00	-.37427826 00	-.37165186 00	-.26264004-02

DIFFERENCES

PERICYNTHION

TIME= 0.HRS
RAD -0.34093750E 03 VEL 0.53586867E 00 GAM -0.10008067E-02 PSI -0.13502121E-01 RAS -0.10245323E-01
DEC 0.1[illegible]185E-01 ALT -0.84892187E 03 RUP -0.64412500E 03 SMA -0.45675000E 03 ECC 0.58397651E-04
INC 0.24937657E-02 M M 0.73757172E-02 ASN 0.29033661E-01 ARP -0.35019875E-01 TAN -0.80747530E-04
DR 0.17915408E 04 DV 0.15981535E 01

ACQUISITION

TIME= 0.63333333E 03 HRS
RAD -0.54[illegible]E 02 VEL 0.60546875E-01 GAM 0.38216577E-02 PSI 0.86383820E-02 RAS 0.30040741E-02
DEC 0.75917244E-02 ALT -0.54500000E 02 RUP -0.49656250E 03 SMA 0.14387500E 03 ECC 0.65743923E-04
INC 0.25271675E-02 M M -0.23593903E-02 ASN 0.28202057E-01 ARP -0.69160461E-02 TAN -0.27611852E-04
DR 0.15[illegible]E 04 DV 0.60723697E 00

END OF TRACK

TIME= .13[illegible] 1HRS
RAD 0.7[illegible] 2 VEL -0.93578613E-01 GAM -0.23390236E-02 PSI 0.12487411E-01 RAS -0.15430450E-02
DEC -0.[illegible]211[illegible]E- 2 ALT 0.75937500E 02 RUP -0.17131250E 03 SMA -0.20500000E 03 ECC 0.53346157E-05
INC 0.26481152E-02 M M 0.33617483E-02 ASN 0.27359099E-01 ARP -0.27646338E-01 TAN 0.17843415E-03
DR 0.51718[illegible]42[illegible] 03 DV 0.72852367E 00

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(d) Case 21: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.33032006 06	-.61786741 06	-.80957073 05	.80910578 09	-.57587749 09	-.15124483 08
Y	-.61786741 06	.12281069 07	.19605714 06	-.15429908 10	.10982034 10	.44160052 08
Z	-.80957073 05	.19605714 06	.47619120 05	-.21406052 09	.15440420 09	.14579863 08
DX	.80910578 09	-.15429908 10	-.21406052 09	.20195566 13	-.14157400 13	-.32173800 11
DY	-.57587749 09	.10982034 10	.15440420 09	-.14157400 13	.10105678 13	.32498797 11
DZ	-.15124483 08	.44160052 08	.14579863 08	-.32173800 11	.32498797 11	.92031784 10

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	-.99999999 00	.97008485 00	.64550058 00	-.99062620 00	.99673542 00	.27431159 00
Y	.97008485 00	-.10000000 01	-.81072558 00	.97975440 00	-.98578442 00	-.41537712 00
Z	.64550058 00	-.81072558 00	-.10000000 01	.69026823 00	-.70385905 00	-.69645625 00
DX	-.99062620 00	.97975440 00	.69026823 00	-.10000000 01	.99099795 00	.23599643 00
DY	.99673542 00	-.98578442 00	-.70385905 00	.99099795 00	-.10000000 01	-.33698893 00
DZ	.27431159 00	-.41537712 00	-.69645625 00	.23599643 00	-.33698893 00	-.10000000 01

J INVERSE ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.18164051 00	-.17648987 00	.19242191 00	-.11514862-04	.25273740-03	-.92207544-04
Y	-.17648987 00	.25197411 00	-.28593561 00	.24488955-04	-.29952955-03	.97210673-04
Z	.19242191 00	-.28593561 00	.63535196 00	.26299353-03	.72227893-03	-.94943571-03
DX	-.11514862-04	.24488955-04	.26299353-03	.27735377-06	.34046579-06	-.78572886-06
DY	.25273740-03	-.29952955-03	.72227893-03	.34046579-06	.87438243-06	-.11890744-05
DZ	-.92207544-04	.97210673-04	-.94943571-03	-.78572886-06	-.11890744-05	.23383037-05

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(d) Case 21: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.18164051 00	-.17648987 00	.19242191 00	-.11514862-04	.25273740-03	-.92207544-04
Y	-.17648987 00	.25197411 00	-.28593561 00	.24488955-04	-.29952955-03	.97210673-04
Z	.19242191 00	-.28593561 00	.63535196 00	.26299353-03	.72227893-03	-.94943571-03
DX	-.11514862-04	.24488955-04	.26299353-03	.27735377-06	.34046579-06	-.78572886-06
DY	.25273740-03	-.29952955-03	.72227893-03	.34046579-06	.87438243-06	-.11890744-05
DZ	-.92207544-04	.97210673-04	-.94943571-03	-.78572886-06	-.11890744-05	.23383037-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.99999999 00	-.82496489 00	.56642310 00	-.51302124-01	.63417984 00	-.14148475 00
Y	-.82496489 00	.99999999 00	-.71463306 00	.92635031-01	-.63813271 00	.12664427 00
Z	.56642310 00	-.71463306 00	.99999999 00	.62649965 00	.96905193 00	-.77894701 00
DX	-.51302124-01	.92635031-01	.62649965 00	.99999999 00	.69136234 00	-.97567507 00
DY	.63417984 00	-.63813271 00	.96905193 00	.69136234 00	.10000000 01	-.83158731 00
DZ	-.14148475 00	.12664427 00	-.77894701 00	-.97567507 00	-.83158731 00	.10000000 01

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(d) Case 21: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC3					
171032	60	12	-.18991943	05	.100	00	.0015
171132	60	12	-.19152750	05	.100	00	-.0085
171232	60	12	-.19293393	05	.100	00	.0015
171332	60	12	-.19414763	05	.100	00	-.0034
171432	60	12	-.19517719	05	.100	00	.0022
171532	60	12	-.19603081	05	.100	00	-.0017
171632	60	12	-.19671645	05	.100	00	-.0051
171732	60	12	-.19724161	05	.100	00	.0029
171832	60	12	-.19761356	05	.100	00	.0056
171932	60	12	-.19783917	05	.100	00	.0002
172032	60	12	-.19792503	05	.100	00	.0032
172132	60	12	-.19787740	05	.100	00	.0068
172232	60	12	-.19770225	05	.100	00	-.0000
172332	60	12	-.19740526	05	.100	00	.0090
172432	60	12	-.19699180	05	.100	00	-.0027
172532	60	12	-.19646703	05	.100	00	.0027
172632	60	12	-.19583577	05	.100	00	.0027
172732	60	12	-.19510267	05	.100	00	.0005
172832	60	12	-.19427209	05	.100	00	.0005
172932	60	12	-.19334817	05	.100	00	-.0081
173032	60	12	-.19233486	05	.100	00	.0024
173132	60	12	-.19123588	05	.100	00	-.0034
173232	60	12	-.19005476	05	.100	00	.0007
173332	60	12	-.18879484	05	.100	00	.0010
173432	60	12	-.18745929	05	.100	00	-.0039
173532	60	12	-.18605113	05	.100	00	-.0039
173632	60	12	-.18457316	05	.100	00	-.0002
173732	60	12	-.18302809	05	.100	00	.0005
173832	60	12	-.18141845	05	.100	00	-.0051
173932	60	12	-.17974664	05	.100	00	-.0024
174032	60	12	-.17801494	05	.100	00	.0024
174132	60	12	-.17622549	05	.100	00	-.0007
174232	60	12	-.17438034	05	.100	00	.0002
174332	60	12	-.17248139	05	.100	00	.0056
174432	60	12	-.17053046	05	.100	00	-.0042
174532	60	12	-.16852927	05	.100	00	.0022
174632	60	12	-.16647944	05	.100	00	.0029
174732	60	12	-.16438250	05	.100	00	.0002
174832	60	12	-.16223989	05	.100	00	-.0026
174932	60	12	-.16005298	05	.100	00	.0067
175032	60	12	-.15782305	05	.100	00	-.0031

TABLE XIII.-NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(d) Case 21: 40-minute arc of 2-way tracking with 28 minutes of 3-way tracking

DATA STATISTICS — STATION 12 — ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-175032	41	.383-02	.383-02	.128-03	.146-04

STATION NUMBER 61 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC3	C3			
171031	60	12		-.16016062	05	.114	00 .0111
171131	60	12		-.16183780	05	.114	00 .0039
171231	60	12		-.16331456	05	.114	00 .0051
171331	60	12		-.16459986	05	.115	00 -.0071
171431	60	12		-.16570227	05	.115	00 -.0073
171531	60	12		-.16663007	05	.115	00 -.0022
171631	60	12		-.16739119	05	.116	00 -.0071
171731	60	12		-.16799318	05	.116	00 -.0083
171831	60	12		-.16844327	05	.117	00 .0007
171931	60	12		-.16874839	05	.118	00 .0046
172031	60	12		-.16891512	05	.118	00 -.0063
172131	60	12		-.16894971	05	.119	00 .0034
172231	60	12		-.16885815	05	.119	00 -.0112
172331	60	12		-.16864610	05	.120	00 -.0000
172431	60	12		-.16831895	05	.121	00 -.0061
172531	60	12		-.16788184	05	.122	00 .0078
172631	60	12		-.16733960	05	.123	00 .0083
172731	60	12		-.16669684	05	.123	00 .0083
172831	60	12		-.16595795	05	.124	00 .0022
173231	60	12		-.16212062	05	.128	00 .0023
173331	60	12		-.16095896	05	.129	00 .0035
173431	60	12		-.15972297	05	.131	00 -.0042
173531	60	12		-.15841562	05	.132	00 .0023
173631	60	12		-.15703974	05	.134	00 -.0026
173731	60	12		-.15559800	05	.135	00 -.0010
173831	60	12		-.15409293	05	.137	00 -.0082

DATA STATISTICS — STATION 61 — ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.603-02	.604-02	-.300-03	.365-04

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(e) Case 22: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

ITERATION NUMBER 5 EPOCH 66/08/14 163152.013 CLOCK L25140 SOS .25654 00 QSOS .25654 00

X 20571001057515255230023 0 Y 21367647745716015237205 2 Z 21255111562315757256215 7
DX 60170527741354641237413 0 DY 17662524732514362515701 0 DZ 57757741242454405640666 2
000000 23443525422200000000000

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.93318483-03	.38446910 00	.00000000 00	.28502000 02	.28501067 02	.31679165 02	-.31780975 01
Y	.25251443-03	.47292326 00	.00000000 00	.17864965 04	.17864968 04	.17898292 04	-.33323822 01
Z	-.13112128-03	.77803153 00	.00000000 00	.72230398 03	.72230385 03	.72503366 03	-.27298126 01
DX	-.36152869-07	.42676349-03	.00000000 00	-.17709924 01	-.17709924 01	-.17678667 01	-.31257569-02
DY	-.85505272-06	.85061291-03	.00000000 00	.19791442 00	.19791357 00	.20060200 00	-.26884321-02
DZ	.27823455-06	.12817579-02	.00000000 00	-.37453210 00	-.37453182 00	-.37165186 00	-.28799623-02

DIFFERENCES

PERICYNTHION

TIME= 0.HRS
RAD -0.66331250E 03 VEL -0.43109131E 01 GAM -0.15698446E-02 PSI -0.46339035E-02 RAS -0.10488513E-01
DEC -0.31092186E-01 ALT -0.65331250E 03 ROP -0.65612500E 03 SMA -0.28162500E 03 ECC 0.50660223E-04
INC 0.71771145E-02 M M -0.46162469E-02 ASN 0.11215210E-01 AOP -0.18499374E-01 TAN -0.12254110E-03
DR 0.17579555E 04 DV 0.11754094E 01

ACQUISITION

TIME= 0.63333333E 00 HRS
RAD -0.51125000E 02 VEL 0.97900391E-01 GAM 0.32052994E-02 PSI 0.92420578E-02 RAS -0.21991730E-02
DEC -0.47633716E-04 ALT -0.51218750E 02 ROP -0.30862500E 03 SMA 0.31387500E 03 ECC 0.58084726E-04
INC 0.75042248E-02 M M -0.51441193E-02 ASN 0.10372162E-01 AOP 0.14686584E-02 TAN -0.82552433E-04
DR 0.32556772E 03 DV 0.80269255E 00

END OF TRACK

TIME= 0.16333333E 01 HRS
RAD -0.[illegible]E 02 VEL -0.4[illegible]5273E-01 GAM -0.34236908E-02 PSI 0.23768455E-02 RAS -0.19226074E-02
DEC -0.[illegible]E-02 ALT -0.69[illegible]E 02 ROP -0.22143750E 03 SMA -0.20625000E 03 ECC 0.85383654E-05
INC 0.73[illegible]E-02 M M -0.33826828E-02 ASN 0.91362000E-02 AOP -0.15061378E-01 TAN 0.15658699E-03
DR 0.17[illegible]E 04 DV 0.12748660E 00

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(e) Case 22: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.38169274 06	-.91285726 06	-.19327875 06	.11683429 10	-.71045457 09	.66799228 07
Y	-.91285726 06	.29226036 07	.84227142 06	-.36036472 10	.18708931 10	-.79387936 08
Z	-.19327875 06	.84227142 06	.29462929 06	-.99778484 09	.44891536 09	-.31589283 08
DX	.11683429 10	-.36036472 10	-.99778484 09	.45347845 13	-.23555760 13	.12209768 12
DY	-.71045457 09	.18708931 10	.44891536 09	-.23555760 13	.13630718 13	-.23995200 11
DZ	.66799228 07	-.79387936 08	-.31589283 08	.12209768 12	-.23995200 11	.19897228 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.86429294 00	.57635386 00	-.88804516 00	.98496318 00	-.76651064-01
Y	.86429294 00	-.10000000 01	-.90767243 00	.98987187 00	-.93735619 00	.32921018 00
Z	.57635386 00	-.90767243 00	-.10000000 01	.86321827 00	-.70838138 00	.41257748 00
DX	-.88804516 00	.98987187 00	.86321827 00	-.10000000 01	.94745684 00	-.40647401 00
DY	.98496318 00	-.93735619 00	-.70838138 00	.94745684 00	-.10000000 01	.14570308 00
DZ	-.76651064-01	.32921018 00	.41257748 00	-.40647401 00	.14570308 00	-.10000000 01

J INVERSE ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.14781649 00	-.16627578 00	.16458381 00	-.30795794-04	.19740864-03	-.24709666-04
Y	-.16627578 00	.22365641 00	-.29081275 00	-.15843107-04	-.32180543-03	.19562448-03
Z	.16458381 00	-.29081275 00	.60533306 00	.22287267-03	.65610684-03	-.83093046-03
DX	-.30795794-04	-.15843107-04	.22287267-03	.18212707-06	.23770422-06	-.52998247-06
DY	.19740864-03	-.32180543-03	.65610684-03	.23770422-06	.72354233-06	-.89468679-06
DZ	-.24709666-04	.19562448-03	-.83093046-03	-.52998247-06	-.89468679-06	.16429034-05

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM, 3M/SEC) - Continued

(e) Case 22: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.14781649 00	-.16627578 00	.16458381 00	-.30795794-04	.19740864-03	-.24709666-04
Y	-.16627578 00	.22365641 00	-.29081275 00	-.15843107-04	-.32180543-03	.19562448-03
Z	.16458381 00	-.29081275 00	.60533306 00	.22287267-03	.65610684-03	-.83093046-03
DX	-.30795794-04	-.15843107-04	.22287267-03	.18212707-06	.23770422-06	-.52998247-06
DY	.19740864-03	-.32180543-03	.65610684-03	.23770422-06	.72354233-06	-.89468679-06
DZ	-.24709666-04	.19562448-03	-.83093046-03	-.52998247-06	-.89468679-06	.16429034-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.91448557 00	.55021000 00	-.18769068 00	.60363267 00	-.50141742-01
Y	-.91448557 00	.10000000 01	-.79036111 00	-.78498691-01	-.79996450 00	.32272046 00
Z	.55021000 00	-.79036111 00	.10000000 01	.67123155 00	.99139197 00	-.83322342 00
DX	-.18769068 00	-.78498691-01	.67123155 00	.99999999 00	.65481354 00	-.96887609 00
DY	.60363267 00	-.79996450 00	.99139197 00	.65481354 00	.99999999 00	-.82060288 00
DZ	-.50141742-01	.32272046 00	-.83322342 00	-.96887609 00	-.82060288 00	.10000000 01

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(e) Case 22: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3				
171032	60	12	-.18991943	05	.100	00	.0012
171132	60	12	-.19152749	05	.100	00	-.0088
171232	60	12	-.19293392	05	.100	00	-.0000
171332	60	12	-.19414763	05	.100	00	-.0039
171432	60	12	-.19517717	05	.100	00	.0007
171532	60	12	-.19603081	05	.100	00	-.0022
171632	60	12	-.19671644	05	.100	00	-.0056
171732	60	12	-.19724161	05	.100	00	.0024
171832	60	12	-.19761355	05	.100	00	.0051
171932	60	12	-.19783916	05	.100	00	-.0005
172032	60	12	-.19792502	05	.100	00	.0020
172132	60	12	-.19787739	05	.100	00	.0059
172232	60	12	-.19770224	05	.100	00	-.0007
172332	60	12	-.19740524	05	.100	00	.0078
172432	60	12	-.19699179	05	.100	00	-.0039
172532	60	12	-.19646701	05	.100	00	.0007
172632	60	12	-.19583575	05	.100	00	.0005
172732	60	12	-.19510265	05	.100	00	-.0015
172832	60	12	-.19427206	05	.100	00	-.0022
172932	60	12	-.19334814	05	.100	00	-.0112
173032	60	12	-.19233482	05	.100	00	-.0012
173132	60	12	-.19123584	05	.100	00	-.0078
173232	60	12	-.19005471	05	.100	00	-.0037
173332	60	12	-.18879480	05	.100	00	-.0034
173432	60	12	-.18745925	05	.100	00	-.0083
173532	60	12	-.18605108	05	.100	00	-.0083
173632	60	12	-.18457312	05	.100	00	-.0049
173732	60	12	-.18302804	05	.100	00	-.0044
173832	60	12	-.18141840	05	.100	00	-.0103
173932	60	12	-.17974659	05	.100	00	-.0073
174032	60	12	-.17801489	05	.100	00	-.0027
174132	60	12	-.17622545	05	.100	00	-.0054
174232	60	12	-.17438029	05	.100	00	-.0042
174332	60	12	-.17248135	05	.100	00	.0015
174432	60	12	-.17053042	05	.100	00	-.0076
174532	60	12	-.16852924	05	.100	00	-.0007
174632	60	12	-.16647943	05	.100	00	.0017
174732	60	12	-.16438249	05	.100	00	-.0007
174832	60	12	-.16223990	05	.100	00	-.0018
174932	60	12	-.16005300	05	.100	00	.0081
175032	60	12	-.15782309	05	.100	00	.0002
175132	60	12	-.15555137	05	.100	00	.0039
175232	60	12	-.15323901	05	.100	00	.0007
175332	60	12	-.15088706	05	.100	00	.0057
175432	60	12	-.14849654	05	.100	00	.0045
175532	60	12	-.14606841	05	.100	00	.0082
175632	60	12	-.14360358	05	.100	00	-.0001
175732	60	12	-.14110288	05	.100	00	.0052
175832	60	12	-.13856711	05	.100	00	.0031
175932	60	12	-.13599702	05	.100	00	.0017
180032	60	12	-.13339329	05	.100	00	.0043
180132	60	12	-.13075660	05	.100	00	.0100
180232	60	12	-.12808755	05	.100	00	-.0032
180332	60	12	-.12538671	05	.100	00	.0043
180432	60	12	-.12265462	05	.100	00	-.0049
180532	60	12	-.11989177	05	.100	00	.0017
180632	60	12	-.11709863	05	.100	00	.0046
180732	60	12	-.11427563	05	.100	00	-.0039
180832	60	12	-.11142316	05	.100	00	-.0087
180932	60	12	-.10854161	05	.100	00	.0023
181032	60	12	-.10563129	05	.100	00	-.0131

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(e) Case 22: 60-minute arc of 2-way tracking with 28 minutes of 3-way tracking

DATA STATISTICS — STATION 12 — ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-171032	8/14-181032	61	.513-02	.522-02	-.965-03	.272-04

STATION NUMBER 61 66/08/14 ITERATION NUMBER 5 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME HMS	TC	Q	CC3	C3
171031	60	12		-.16016060 05 .114 00 .0089
171131	60	12		-.16183779 05 .114 00 .0029
171231	60	12		-.16331456 05 .114 00 .0045
171331	60	12		-.16459985 05 .115 00 -.0073
171431	60	12		-.16570228 05 .115 00 -.0068
171531	60	12		-.16663008 05 .115 00 -.0012
171631	60	12		-.16739121 05 .116 00 -.0051
171731	60	12		-.16799320 05 .116 00 -.0059
171831	60	12		-.16844330 05 .117 00 .0039
171931	60	12		-.16874843 05 .118 00 .0083
172031	60	12		-.16891515 05 .118 00 -.0027
172131	60	12		-.16894976 05 .119 00 .0078
172231	60	12		-.16885820 05 .119 00 -.0066
172331	60	12		-.16864615 05 .120 00 .0054
172431	60	12		-.16831900 05 .121 00 -.0010
172531	60	12		-.16788189 05 .122 00 .0127
172631	60	12		-.16733965 05 .123 00 .0134
172731	60	12		-.16669690 05 .123 00 .0137
172831	60	12		-.16595800 05 .124 00 .0073
173231	60	12		-.16212068 05 .128 00 .0081
173331	60	12		-.16095903 05 .129 00 .0096
173431	60	12		-.15972302 05 .131 00 .0013
173531	60	12		-.15841568 05 .132 00 .0082
173631	60	12		-.15703980 05 .134 00 .0039
173731	60	12		-.15559807 05 .135 00 .0055
173831	60	12		-.15409300 05 .137 00 -.0012

DATA STATISTICS — STATION 61 — ITERATION 5

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	C3	8/14-171031	8/14-173831	26	.637-02	.721-02	.337-02	[illegible]

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(f) Case 23: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

ITERATION NUMBER 5 EPOCH 66/08/14 163152.013 CLOCK L25140 SDS .72438 00 QSDS .72438 00

X	20570610361215220570067 5	Y	21367651570116066020166 6	Z	21255107711515732543476 0
DX	60170526666354662451465 7	DY	17662512000414303043476 7	DZ	57757750550454440201440 7
000000	23443525422200000000000 0				

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	-.38199347-03	.17430410 00	.00000000 00	.28383654 02	.28383273 02	.31679165 02	-.32958922 01
Y	-.10044507-03	.30961237 00	.00000000 00	.17866085 04	.17866084 04	.17898292 04	-.32207794 01
Z	.53552921-03	.75894943 00	.00000000 00	.72224614 03	.72224668 03	.72503366 03	-.27869873 01
DX	.27714251-06	.34045015-03	.00000000 00	-.17709266 01	-.17709263 01	-.17678667 01	-.30595958-02
DY	.21720719-06	.81458123-03	.00000000 00	.19782999 00	.19783021 00	.20060200 00	-.27717910-02
DZ	-.88577169-06	.11749355-02	.00000000 00	-.37464365 00	-.37464453 00	-.37165186 00	-.29926747-02

```
*                                                    DIFFERENCES
*                                                    PERICYNTHION
*    TIME=  .HRS
* RAC -[illegible] VEL  .26654[illegible]63E [illegible] GAM -[illegible].11911616E-02 PSI -[illegible].47779[illegible]63E-03 RAS -[illegible].66555931E-02
* DEC [illegible].82944398E-[illegible]2 ALT -[illegible].39990625E [illegible] RUP -[illegible].3943[illegible]E [illegible] SMA -[illegible].1321257[illegible]E [illegible] ECC [illegible].33311546E-04
* INC [illegible].68223476E-[illegible]2 M M [illegible].21610260E-[illegible]2 ASN [illegible].34985774E-02 ARP -0.8440[illegible]9714E-[illegible]2 TAN -0.92468224E-04
* DR [illegible].12[illegible]4737E [illegible]4 DV [illegible].7742[illegible]9105E [illegible]                                ACQUISITION
*
*    TIME= [illegible].63333333E [illegible] HRS
* RAC [illegible].3587500[illegible]E [illegible]2 VEL [illegible].88317871E-01 GAM [illegible].21[illegible]9445E-[illegible]2 PSI [illegible].73366165E-02 RAS -[illegible].34969847E-02
* DEC -[illegible].22[illegible]96634E-[illegible]2 ALT [illegible].3584375[illegible]E [illegible]2 RUP -[illegible].4737500[illegible]E [illegible]2 SMA [illegible].4636250[illegible]E [illegible] ECC [illegible].4080310[illegible]E-04
* INC [illegible].7143[illegible]58E-[illegible]2 M M -[illegible].7598[illegible]36E-[illegible]2 ASN [illegible].2658844[illegible]E-[illegible]2 ARP [illegible].5463[illegible]2E-[illegible]2 TAN -0.10940433E-03
* DR [illegible].6113[illegible]935E [illegible] DV [illegible].67547943E [illegible]                                END OF TRACK
*
*    TIME= [illegible] HRS
* RAC -[illegible].8647[illegible] VEL [illegible].31[illegible]4932E [illegible] GAM -[illegible].2559[illegible]324E-[illegible]2 PSI -[illegible].7226[illegible]513E-[illegible]2 RAS [illegible].2779010[illegible]E-[illegible]2
* DEC -[illegible].1 147[illegible] - [illegible]2 ALT -[illegible].8647[illegible]2E [illegible] RUP -[illegible].2825[illegible]E [illegible] SMA -[illegible].2255000[illegible]E 03 ECC 0.13813376E-04
* INC [illegible].7268[illegible]1[illegible]E-[illegible]2 M M [illegible].3695[illegible]87E-02 ASN [illegible].7625[illegible]945E-03 ARP -[illegible].1366806[illegible]E-01 TAN [illegible].30732155E-03
* DR [illegible].5564[illegible]9[illegible] [illegible]3 DV [illegible].640[illegible]2765E [illegible]
*
```

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Continued

(f) Case 23: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.71093076 06	-.44030705 07	-.14821869 07	.61711977 10	-.19090536 10	.74579235 09
Y	-.44030705 07	.51552989 08	.18977440 08	-.74348439 11	.17108873 11	-.11443507 11
Z	-.14821869 07	.18977440 08	.70597767 07	-.27390690 11	.61145961 10	-.42813167 10
DX	.61711977 10	-.74348439 11	-.27390690 11	.10752938 15	-.24423447 14	.16729674 14
DY	-.19090536 10	.17108873 11	.61145961 10	-.24423447 14	.62777032 13	-.34828261 13
DZ	.74579235 09	-.11443507 11	-.42813167 10	.16729674 14	-.34828261 13	.27511147 13

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.72730245 00	.66159747 00	-.70581719 00	.90365797 00	-.53327340 00
Y	.72730245 00	-.10000000 01	-.99475292 00	.99857652 00	-.95102970 00	.96089932 00
Z	.66159747 00	-.99475292 00	-.10000000 01	.99413169 00	-.91848466 00	.97146582 00
DX	-.70581719 00	.99857652 00	.99413169 00	-.10000000 01	.94003276 00	-.97267902 00
DY	.90365797 00	-.95102970 00	-.91848466 00	.94003276 00	-.10000000 01	.83806373 00
DZ	-.53327340 00	.96089932 00	.97146582 00	-.97267902 00	.83806373 00	-.10000000 01

J INVERSE ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.30381921-01	-.46709545-01	.10659359 00	.45781977-04	.12109049-03	-.16175229-03
Y	-.46709545-01	.95859817-01	-.23340728 00	-.10366904-03	-.25184873-03	.35975291-03
Z	.10659359 00	-.23340728 00	.57600424 00	.25777442-03	.61597198-03	-.89112854-03
DX	.45781977-04	-.10366904-03	.25777442-03	.11590631-06	.27451543-06	-.39978432-06
DY	.12109049-03	-.25184873-03	.61597198-03	.27451543-06	.66354258-06	-.95114914-06
DZ	-.16175229-03	.35975291-03	-.89112854-03	-.39978432-06	-.95114914-06	.13804733-05

TABLE XIII.- NON-NOMINAL CM CASES WITH P = 0 AND ΔS = (3.5KM; 3M/SEC) - Concluded

(f) Case 23: 120-minute arc of 2-way tracking with 28 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.30381921-01	-.46709545-01	.10659359 00	.45781977-04	.12109049-03	-.16175229-03
Y	-.46709545-01	.95859817-01	-.23340728 00	-.10366904-03	-.25184873-03	.35975291-03
Z	.10659359 00	-.23340728 00	.57600424 00	.25777442-03	.61597198-03	-.89112854-03
DX	.45781977-04	-.10366904-03	.25777442-03	.11590631-06	.27451543-06	-.39978432-06
DY	.12109049-03	-.25184873-03	.61597198-03	.27451543-06	.66354258-06	-.95114914-06
DZ	-.16175229-03	.35975291-03	-.89112854-03	-.39978432-06	-.95114914-06	.13804733-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 5

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.86552522 00	.80576919 00	.77149551 00	.85284093 00	-.78982127 00
Y	-.86552522 00	.10000000 01	-.99330644 00	-.98350647 00	-.99858966 00	.98894469 00
Z	.80576919 00	-.99330644 00	.10000000 01	.99763907 00	.99635409 00	-.99934053 00
DX	.77149551 00	-.98350647 00	.99763907 00	.10000000 01	.98987149 00	-.99944340 00
DY	.85284093 00	-.99858966 00	.99635409 00	.98987149 00	.99999998 00	-.99380277 00
DZ	-.78982127 00	.98894469 00	-.99934053 00	-.99944340 00	-.99380277 00	.99999999 00

TABLE XIV.- STANDARD LM ORBIT

DOUBLE PRECISION EPHEMERIS TAPE - EPHEM1

GME	.39860127 C6	J	.16234500-C2	H	-.57499999-C5	D	.78749999-05	RE	.63781650 04	REM	.63783143 04
G	.66709958-19	A	.68781796 29	B	.88800194 29	C	.88836976 29	OME	.41780741-02	AU	.14959850 09
GMM	.49025800 C4	GMS	.13271544 12	GMV	.32476550 C6	GMA	.42977799 05	GMC	.37918700 08	GMJ	.12671060 09
EGM	.39860127 C6	MGM	.49025800 C4	JA	.29200000-02	HA	.00000000 00	DA	.00000000 00	RA	.34170000 04
C21	-.41379999-C4	C31	.39440000-C4	C41	-.36950000-C4	C22	.22580000-04	C32	.26890000-04	C42	-.13840000-04
C33	.20560000-C6	C43	.11770000-C5	C44	.34600000-C7	S21	.28760000-04	S31	.18620000-04	S41	.33639999-04
S22	.70119999-C5	S32	.36110000-C4	S42	.17690000-C4	S33	-.60489999-05	S43	.42350000-06	S44	-.41470000-06
J2C	.20480000-C3	J3C	-.15000000-C4	J4C	.00000000 00						

INJECTION CONDITIONS 1990.0 MOON 2357641000776202001523000 J.D.= 2439352.18879644 AUG. 14,1966 16 31 52.013

SELENOCENTRIC XO .35870993 C2 YO .17667326 04 ZO .72193157 03 DXO-.17707255 01 DYO .20407493 00 DZO-.37183874 00
CARTESIAN TO .59512012 C5 GHA .21061189 03 GHO .32196625 03
DATE OF RUN 120164P -IFM24

MOON IS THE CENTRAL BODY FOR INTEGRATION COWELL EQUATIONS OF MOTION

0 DAYS 0 HRS. 0 MIN. 0.000 SEC. 2357641000776202001523000 J.D.= 2439352.18879644 AUG. 14,1966 16 31 52.013

GEOCENTRIC — EQUATORIAL COORDINATES

X	-.15982834 C6	Y	.28934168 C6	Z	.15693197 C6	DX	-.27156517 01	DY	-.29691362 00	DZ	-.55073275 00
R	.36591167 C6	DEC	.25396464 C2	RA	.11891565 C3	V	.27867953 01	PTH	.14870775 02	AZ	.11063470 03
R	.36591167 C6	LAT	.25396464 C2	LON	.26830375 C3	VE	.21616164 02	PTE	.18960605 01	AZE	.26748186 03
XS	-.11847375 C9	YS	.86667606 08	ZS	.37586152 08	DXS	-.18097419 02	DYS	-.21276313 02	DZS	-.92266068 01
XM	-.15985652 C6	YM	.28755485 C6	ZM	.15620993 C6	DXM	-.94478511 00	DYM	-.49451562 00	DZM	-.17608090 00
XT	-.15985652 C6	YT	.28755485 C6	ZT	.15620993 06	DXT	-.94478511 00	DYT	-.49451562 00	DZT	-.17608090 00
RS	.15152565 C9	VS	.29416464 C2	RM	.36420247 C6	VM	.10808187 01	RT	.36420247 06	VT	.10808187 01
GEC	.25547551 C2	ALT	.35993743 C6	LCS	.29320135 C3	RAS	.14381325 03	RAM	.11907041 03	LOM	.26845850 C3
DUT	.36600000 C2	DT	.16750000 C2	DR	.71520276 00	SHA	-.15936115 06	DES	.14362234 02	DEM	.25398381 02
CCL	.27179108 C3	MCL	.19224482 C3	TCL	.19224482 C3						

HELIOCENTRIC — EQUATORIAL COORDINATES

X	.11831392 C9	Y	-.86376265 C8	Z	-.37429220 C8	DX	.15381767 02	DY	.20979400 02	DZ	.86758741 01
R	.15119634 C9	LAT	-.14332801 02	LON	.32386768 C3	V	.27422705 02	PTH	-.43850975 01	AZ	.72066990 02
XE	.11847375 C9	YE	-.86667606 C8	ZE	-.37586152 C8	DXE	.18097419 02	DYE	.21276313 02	DZE	.92266068 01
XT	.11831389 C9	YT	-.86380052 C8	ZT	-.37429943 C8	DXT	.17152634 02	DYT	.20781798 02	DZT	.90505260 01
LTE	-.14362234 C2	LOE	.32381324 03	LTT	-.14332970 C2	LOT	.32386710 03	RST	.15119752 09	VST	.28425481 02
EPS	.15412134 C3	ESP	.60165642-01	SEP	.25818265 C2	EPM	.27458156 02	EMP	.15240203 03	MEP	.13988231 00
MPS	.12765661 C3	MSP	.27453512-18	SMP	.52342805 C2	SEM	.25688096 02	EMS	.15425208 03	ESM	.60165642-01
REM	.19274037 C4	SEN	.15312260 C3								
GCE	.88208918 C2	GCT	.10045375 C3	SIP	.63263864 C2	CPT	.10505609 03	SIN	.40703344 02		
REF	.36591167 C6	VEP	.27867953 C1	CPE	.99364642 C2	CPS	.78713094 02				

SELENOCENTRIC — EQUATORIAL COORDINATES

X	.28179164 C2	Y	.17668292 C4	Z	.72203365 C3	DX	-.17708666 01	DY	.19760200 00	DZ	-.37465185 00
R	.19274037 C4	DEC	.22000496 C2	RA	.89096492 C2	V	.18208183 01	PTH	.53335410 00	AZ	.10304352 03
R	.19274033 C4	LAT	-.51929671 00	LON	.14819057 C3	VP	.18158167 01	PTP	.53482088 00	AZP	.10224724 03
LTS	.14949602 C1	LNS	.20049937 C3	LTE	-.59133335 C1	LNE	.35507299 03				
ALT	.18931372 C3	SHA	-.15258873 04	ALP	.17890048 C3	DR	.16949340-01	DP	.54124974-01	ASD	.64392751 02
HGE	.20587665 C3	SVL	-.96662236 C1	HNG	.23170385 C3	SIA	-.36934594 02				

SELENOCENTRIC CONIC

EPOCH OF PERICENTER PASSAGE 2357641007632023315451 60 J.D.= 2439352.18830672 AUG. 14,1966 16 31 [illegible]

TABLE XIV.- STANDARD LM ORBIT - Continued

IBSYS-JPTRAJ-SPACE 030866

SMA	.27669145 C4	ECC	.30354010 C0	B	.26363675 04	SLR	.25119805 04	APO	.36067840 04	RCA	.19270450 04
VH	.97297197 C0	C3	-.17718581 C1	C1	.35092998 C4	TFP	.42312222 02	TF	-.48972479-03	PER	.21767566 03
TA	.22907160 C1	MTA	.18000000 C3	EA	.16744955 C1	MA	.11662917 01			TFI	.00000000 00
								C3J	-.51939615 01		

ALL VECTORS REFERENCED TO EARTH EQUATOR PLANE

X	.28179164 C2	Y	.17666292 C4	Z	.72203365 C3	DX	-.17708666 01	DY	.19760200 00	DZ	-.37465185 00
INC	.25410277 C2	LAN	.32736310 C3	APF	.11689661 C3	MX	-.97274461 00	MY	.99898341-01	MZ	-.20925637 00
WX	-.23141771 C0	WY	-.36134499 C0	WZ	.90325834 C0	PX	.53489040-01	PY	.92233150 00	PZ	.38267919 00
QX	-.97138282 C0	QY	.13687318 C0	QZ	-.19411584 C0	RX	.22155600-01	RY	.38203729 00	RZ	-.92388119 00
BX	.97138292 C0	BY	-.13687318 C0	BZ	.19411586 C0	TX	.99832262 00	TY	-.57896014-01	TZ	.00000000 00
DAP	.22499736 C2	RAP	.86660545 C2								

BTQ	.25775183 C4	BRQ	-.55392473 C3	B	.26363675 04	THA	.34787125 03	T VECTOR IN EARTH EQUATOR PLANE
BTC	.25640725 C4	BRC	-.61316016 C3	B	.26363675 C4	THA	.34655112 03	T VECTOR IN ECLIPTIC PLANE

ALL VECTORS REFERENCED TO TRUE TARGET EQU. PLANE AND NODE

X	.15141583 C4	Y	.11924357 C4	Z	-.17468651 C2	DX	-.10904236 01	DY	.14063745 01	DZ	-.38531127 00
INC	.12223944 C2	LAN	.21592351 C3	APF	.18016260 C3	MX	-.60620379 00	MY	.76666038 00	MZ	-.21153919 00
WX	-.12292547 C0	WY	.17167833 00	WZ	.97732750 C0	PX	.80919704 00	PY	.58753711 00	PZ	-.60089246-03
QX	-.57431932 C0	QY	.79077604 C0	QZ	-.21173240 C0	RX	-.48624047-03	RY	-.35304667-03	RZ	-.99999984 00
BX	.57431931 C0	BY	-.79077603 C0	BZ	.21173240 C0	TX	.58753720 00	TY	-.80919716 00	TZ	.00000000 00
DAP	-.34430129-01	RAP	.35982434 C2								

BTT	.25765923 C4	BRT	-.55820396 C3	B	.26363648 C4	THA	.34777610 03	T VECTOR IN TRUE TARGET EQU. PLANE

0 DAYS 1 HRS. 48 MIN. 3.353 SEC. 235764104122202656702402 J.D.= 2439352.26383525 AUG. 14,1966 18 19 55.366

GEOCENTRIC — EQUATORIAL COORDINATES

X	-.16614266 C6	Y	.28097427 C6	Z	.15366349 C6	DX	.10057226-01	DY	-.64212031 00	DZ	.47100260-02
R	.36078035 C6	DEC	.25208898 C2	RA	.12059624 C3	V	.64221633 00	PTH	-.51514661 02	AZ	.52759966 C2
R	.36078035 C6	LAT	.25208898 C2	LON	.24289641 C3	VE	.23491371 02	PTE	-.12261982 C1	AZE	.27059003 03
XS	-.11859099 C9	YS	.86529586 C8	ZS	.37526301 C8	DXS	-.18067994 02	DYS	-.21297920 02	DZS	-.92359988 01
XM	-.16595396 C6	YM	.28429860 C6	ZM	.15504104 C6	DXM	-.93610255 00	DYM	-.50995176 00	DZM	-.18449804 00
XT	-.16595396 C6	YT	.28429860 C6	ZT	.15504104 06	DXT	-.93610255 00	DYT	-.50995176 00	DZT	-.18449804 00
RS	.15152365 C9	VS	.29416959 C2	RM	.36387379 C6	VM	.10818402 01	RT	.36387379 06	VT	.10818402 01
GED	.25359177 C2	ALT	.35440605 C6	LCS	.26618391 C3	RAS	.14388374 03	RAM	.12027344 03	LOM	.24257361 03
DUT	.36600000 C2	DT	.75000000 C2	DR	-.50270604 C0	SHA	-.14906998 06	DES	.14339067 02	DEM	.25219338 02
CCL	.27263625 C3	MCL	.12430653 C2	TCL	.12430653 C2						

HELIOCENTRIC — EQUATORIAL COORDINATES

X	.11842485 C9	Y	-.86248612 C8	Z	-.37372637 C8	DX	.18078051 02	DY	.20655800 02	DZ	.92407089 01
R	.15119518 C9	LAT	-.14310785 C2	LON	.32393421 03	V	.28963230 02	PTH	.18326337 00	AZ	.70726079 02
XE	.11859099 C9	YE	-.86529586 C8	ZE	-.37526301 C8	DXE	.18067994 02	DYE	.21297920 02	DZE	.92359988 01
XT	.11842504 C9	YT	-.86245288 C8	ZT	-.37371260 C8	DXT	.17131891 02	DYT	.20787969 C2	DZT	.90515009 01
LTE	-.14339067 02	LCE	.32388374 C3	LTT	-.14310447 C2	LCT	.32393530 03	RST	.15119309 09	VST	.28417794 02
EPS	.15553827 C3	ESP	.55514057-01	SEP	.24405235 C2	EPM	.14899976 03	EMP	.30708002 02	MEP	.29225050 00
MPS	.54570458 C2	MSP	.27453512-18	SMP	.12542843 C3	SEM	.24680187 02	EMS	.15526223 03	ESM	.57674939-01
RPM	.36033962 C4	SPN	.15452132 C3								
GCE	.87363748 C2	GCT	.27979441 C3	SIP	.25731609 C2	CPT	.75564078 02	SIN	.46725228 02		
REP	.36078035 C6	VEP	.64221633 00	CPE	.99167302 C2	CPS	.78723213 02				

TABLE XIV.- STANDARD LM ORBIT - Continued

```
                                   IBSYS-JPTRAJ-SPACE 030866

   SELENOCENTRIC                                                                                                   EQUATORIAL COORDINATES

    X -.18889576 C3     Y -.33243280 C4     Z -.13775431 04    DX  .94615977 00    DY -.13216855 00    DZ  .18920806 00
    R  .36033962 C4   DEC -.22475614 C2    RA  .26674775 C3     V  .97390272 00   PTH  .54790740-07    AZ  .77863103 02
    R  .36033957 C4   LAT  .58337498-C1   LON  .32502472 C3    VP  .96455309 00   PTP -.10664581-05   AZP  .77672833 02
  LTS  .14946008 C1   LNS  .19958C54 C3   LTE -.59648520 C1   LNE  .35519130 03
  ALT  .18653C62 C4   SHA  .29361924 C4   ALP  .65240850 C0    DR  .00000000 00    DP  .15485534-01   ASC  .28838849 02
  HGE  .20446172 03   SVL  .10101839 C2   HNG  .53925996 C2   SIA  .12016091 03

                                                   SELENOCENTRIC CONIC

EPOCH OF PERICENTER PASSAGE                 23576410076320223235640 2 J.D.= 2439352.18830100  AUG. 14,1966 16 31 09.207
  SMA  .27657534 04   ECC  .30286244 C0    B  .26358577 C4   SLR  .25120629 04   APO  .36033962 04   RCA  .19281106 04
   VH  .97390269 C0    C3 -.17726020 C1   C1  .35093574 C4   TFP  .65261594 04    TF -.49544312-03   PER  .21753866 03
   TA  .17999999 C3   MTA  .18000000 C3   EA  .17999999 C3    MA  .17999999 03                       TFI  .75038809-01
                                                                                   C3J -.50752385 01

                                                   ALL VECTORS REFERENCED TO EARTH EQUATOR PLANE
    X -.18889576 C3     Y -.33243280 C4     Z -.13775431 C4    DX  .94615977 00    DY -.13216855 00    DZ  .18920806 00
  INC  .25392938 C2   LAN  .32738807 C3   APF  .11693947 C3    MX  .97151360 00    MY -.13571021 00    MZ  .19427819 00
   WX -.23111282 C0    WY -.36121554 00    WZ  .90338815 C0    PX  .52422697-01    PY  .92255409 00    PZ  .38229019 00
   QX -.97151360 00    QY  .13571021 C0    QZ -.19427819 C0    RX  .21688058-01    RY  .38167449 00    RZ -.92404230 00
   BX  .97151362 C0    BY -.13571021 C0    BZ  .19427819 C0    TX  .99838945 00    TY -.56731924-01    TZ  .00000000 00
  DAP  .22475614 C2   RAP  .86747751 C2

  BTC  .25769411 C4   BRQ -.55418420 C3    B  .26358577 C4   THA  .34786310 03      T VECTOR IN EARTH EQUATOR PLANE

  BTC  .25637735 C4   BRC -.61221750 C3    B  .26358575 C4   THA  .34656954 03      T VECTOR IN ECLIPTIC PLANE

                                                   ALL VECTORS REFERENCED TO TRUE TARGET.EQU. PLANE AND NODE
    X -.29130527 04     Y -.21209834 C4     Z  .36688690 C1    DX  .56045451 00    DY -.76939684 00    DZ  .20592582 00
  INC  .12207132 C2   LAN  .21578856 C3   APF  .18027588 C3    MX  .57547285 00    MY -.79001419 00    MZ  .21144396 00
   WX -.12365300 C0    WY  .17152119 C0    WZ  .97738958 00    PX  .80841873 00    PY  .58860676 00    PZ -.10181592-02
   QX -.57547276 C0    QY  .79001415 C0    QZ -.21144394 00    RX -.82209947-03    RY -.59929575-03    RZ -.99999937 00
   BX  .57547282 C0    BY -.79001424 00    BZ  .21144397 C0    TX  .58860712 00    TY -.80841923 00    TZ  .00000000 00
  DAP -.58337498-C1   RAP  .36058227 C2

  BTT  .25762595 C4   BRT -.55733605 C3    B  .26358560 C4   THA  .34779301 03      T VECTOR IN TRUE TARGET EQU. PLANE

   0 DAYS  1 HRS. 48 MIN.  3.353 SEC.       23576410412220265670 2402 J.D.= 2439352.26383525  AUG. 14,1966 18 19 55.366
   CHANGE OF PHASE OCCURS AT THIS POINT
                                          MOON     IS THE CENTRAL BODY FOR INTEGRATION   COWELL EQUATIONS OF MOTION

   0 DAYS  1 HRS. 48 MIN.  3.353 SEC.       23576410412220265670 2402 J.D.= 2439352.26383525  AUG. 14,1966 18 19 55.366
```

TABLE XIV.- STANDARD LM ORBIT - Continued

IBSYS-JPTRAJ-SPACE 030866

GEOCENTRIC — EQUATORIAL COORDINATES

X	-.16614266 06	Y	.28097427 06	Z	.15366349 06	DX	.10057226-01	DY	-.64212031 00	DZ	.47100260-02
R	.36078035 06	DEC	.25208898 02	RA	.12059624 00	V	.64221633 00	PTH	-.51514661 02	AZ	.52759966 02
R	.36078035 06	LAT	.25208898 02	LON	.24289641 03	VE	.23491371 02	PTE	-.12261982 01	AZE	.27059003 03
XS	-.11859099 09	YS	.86529586 08	ZS	.37526301 08	DXS	-.18067994 02	DYS	-.21297921 02	DZS	-.92359988 01
XM	-.16595396 06	YM	.28429860 06	ZM	.15504104 06	DXM	-.93610255 00	DYM	-.50995176 00	DZM	-.18449804 00
XT	-.16595396 06	YT	.28429860 06	ZT	.15504104 06	DXT	-.93610255 00	DYT	-.50995176 00	DZT	-.18449804 00
RS	.15152365 09	VS	.29416559 02	RM	.36387379 06	VM	.10818402 01	RT	.36387379 06	VT	.10818402 01
GEC	.25359177 02	ALT	.35440605 06	LOS	.26618391 03	RAS	.14388374 03	RAM	.12027344 03	LOM	.24257361 03
DLT	.36600000 02	DT	.18750000 02	DR	-.50270604 00	SHA	-.14906998 06	DES	.14339067 02	DEM	.25219338 02
CCL	.27263625 03	MCL	.12430653 02	TCL	.12430653 02						

HELIOCENTRIC — EQUATORIAL COORDINATES

X	.11842485 09	Y	-.86248612 08	Z	-.37372637 08	DX	.18078051 02	DY	.20655800 02	DZ	.92407089 01
R	.15119518 09	LAT	-.14310785 02	LON	.32393421 03	V	.28963230 02	PTH	.18326337 00	AZ	.70726079 02
XE	.11859099 09	YE	-.86529586 08	ZE	-.37526301 08	DXE	.18067994 02	DYE	.21297921 02	DZE	.92359988 01
XT	.11842504 09	YT	-.86245288 08	ZT	-.37371260 08	DXT	.17131891 02	DYT	.20787969 02	DZT	.90515009 01
LTE	-.14339067 02	LCE	.32388374 03	LTT	-.14310447 02	LCT	.32393530 03	RST	.15119309 09	VST	.28417794 02
EPS	.15553827 03	ESP	.55514057-01	SEP	.24405235 02	EPM	.14899576 03	EMP	.30708002 02	MEP	.29225050 00
MPS	.54570458 02	MSP	.27453512-18	SMP	.12542843 03	SEM	.24680187 02	EMS	.15526223 03	ESM	.57674939-01
RPM	.36033962 04	SPN	.15452532 03								
GCE	.87363748 02	GCT	.27979441 03	SIP	.25731609 02	CPT	.75564078 02	SIN	.46725228 02		
REP	.36078035 06	VEP	.64221633 00	CPE	.99167302 02	CPS	.78723213 02				

SELENOCENTRIC — EQUATORIAL COORDINATES

X	-.18889576 03	Y	-.33243280 04	Z	-.13775431 04	DX	.94615977 00	DY	-.13216855 00	DZ	.18920806 00
R	.36033962 04	DEC	-.22475614 02	RA	.26674775 03	V	.97390272 00	PTH	-.54790740-07	AZ	.77863103 02
R	.36033957 04	LAT	.58337498-01	LON	.32502472 03	VF	.96455309 00	PTP	-.10664581-05	AZP	.77672833 02
LTS	.14946008 01	LNS	.19558054 03	LTE	-.59648520 01	LNE	.35519130 03				
ALT	.18653062 04	SHA	.29361524 04	ALP	.65240850 00	DR	-.52931568-09	DP	.15485534-01	ASD	.28838849 02
HGE	.20446172 03	SVL	.10101839 02	HNG	.53925996 02	SIA	.12016091 03				

SELENOCENTRIC CONIC

EPOCH OF PERICENTER PASSAGE — 23576410076320223233640 2 J.D.= 2439352.18830099 AUG. 14,1966 16 31 09.207

SMA	.27657534 04	ECC	.30266244 00	B	.26358576 04	SLR	.25120629 04	APO	.36033962 04	RCA	.19281106 04
VH	.97390269 00	C3	-.17726020 01	C1	.35093574 04	TFP	.65261597 04	TF	-.49544560-03	PER	.21753866 03
TA	.18000000 03	MTA	.18000000 03	EA	.18000000 03	MA	.18000000 03			TFI	.75038809-01
								C3J	-.50752385 01		

ALL VECTORS REFERENCED TO EARTH EQUATOR PLANE

X	-.18889576 03	Y	-.33243280 04	Z	-.13775431 04	DX	.94615977 00	DY	-.13216855 00	DZ	.18920806 00
INC	.25392938 02	LAN	.32738807 03	APF	.11693947 03	MX	.97151360 00	MY	-.13571021 00	MZ	.19427819 00
WX	-.23111282 00	WY	-.36121554 00	WZ	.90338815 00	PX	.52422698-01	PY	.92255408 00	PZ	.36225019 00
QX	-.97151358 00	QY	.13571021 00	QZ	-.19427818 00	RX	.21688058-01	RY	.38167449 00	RZ	-.92404229 00
BX	.97151364 00	BY	-.13571021 00	BZ	.19427819 00	TX	.99838945 00	TY	-.56731924-01	TZ	.00000000 00
DAF	.22475614 02	RAP	.86747751 02								

BTG	.25769411 04	BRG	-.55418418 03	B	.26358576 04	THA	.34786310 03	T VECTOR IN EARTH EQUATOR PLANE

TABLE XIV.- STANDARD LM ORBIT - Concluded

IBSYS-JPTRAJ-SPACE 030866

ALL VECTORS REFERENCED TO TRUE TARGET EQU. PLANE AND NODE

X	-.29130527 C4	Y	-.21209834 C4	Z	.36688690 01	DX	.56045451 00	DY	-.76939684 00	DZ	.20592582 00
INC	.12207132 C2	LAN	.21578656 C3	APF	.18027588 C3	MX	.57547285 00	MY	-.79001419 00	MZ	.21144396 00
WX	-.12365300 C0	WY	.17152119 C0	WZ	.97738958 C0	PX	.80841873 00	PY	.58860676 00	PZ	-.10181592-02
QX	-.57547276 C0	QY	.79001415 C0	QZ	-.21144394 C0	RX	-.82309947-03	RY	-.59929575-03	RZ	-.99999937 00
EX	.57547282 00	EY	-.79001424 C0	BZ	.21144397 C0	TX	.58860712 00	TY	-.80841923 00	TZ	.00000000 00
DAP	-.58337495-01	RAP	.36056227 C2								
BTT	.25762595 C4	BRT	-.55733605 03	B	.26358560 C4	THA	.34779301 03		T VECTOR IN TRUE TARGET EQU. PLANE		

0 DAYS 5 HRS. 47 MIN. 30.000 SEC. 235764113132202401523000 J.D.= 2439352.43011589 AUG. 14,1966 22 19 22.013

GEOCENTRIC — EQUATORIAL COORDINATES

X	-.17821793 C6	Y	.27353665 C6	Z	.15124830 C6	DX	-.31878307-01	DY	-.20543618 00	DZ	.15810313 00
R	.35980714 C6	DEC	.24857278 02	RA	.12308532 C3	V	.26118355 00	PTH	-.16442853 02	AZ	.33662893 02
R	.35980713 C6	LAT	.24857278 02	LON	.18536057 C3	VE	.23669021 02	PTE	-.17896376 00	AZE	.27050471 03
XS	-.11885012 C9	YS	.86223241 C8	ZS	.37393457 C8	DXS	-.18002667 02	DYS	-.21345675 02	DZS	-.92567575 01
XM	-.17925750 C6	YM	.27672935 C6	ZM	.15225730 C6	DXM	-.91560546 00	DYM	-.54364871 00	DZM	-.20299103 00
XT	-.17925750 C6	YT	.27672935 06	ZT	.15225730 C6	DXT	-.91560546 00	DYT	-.54364871 00	DZT	-.20299103 00
RS	.15151920 C9	VS	.29418045 C2	RM	.36317305 C6	VM	.10840169 01	RT	.36317305 06	VT	.10840169 01
GEO	.25006025 C2	ALT	.35343274 C6	LOS	.20631515 C3	RAS	.14403991 03	RAM	.12293403 03	LOM	.18520927 03
DUT	.36600000 C2	DT	.75000000 C2	DR	-.73930329-01	SHA	-.13681989 06	DES	.14287653 02	DEM	.24786725 02
CCL	.27395023 C3	MCL	.22522538 C2	TCL	.22522538 C2						

HELIOCENTRIC — EQUATORIAL COORDINATES

X	.11867190 C9	Y	-.85949702 C8	Z	-.37242208 C8	DX	.17970788 02	DY	.21140239 02	DZ	.94148606 01
R	.15118649 09	LAT	-.14260619 02	LON	.32406556 C3	V	.29300145 02	PTH	-.45269981 00	AZ	.70758947 02
XE	.11885012 C9	YE	-.86223241 C8	ZE	-.37393457 C8	DXE	.18002667 02	DYE	.21345675 02	DZE	.92567575 01
XT	.11867066 09	YT	-.85946512 C8	ZT	-.37241200 C8	DXT	.17087061 02	DYT	.20802026 02	DZT	.90537664 01
LTE	-.14287653 02	LCE	.32403991 C3	LTT	-.14260501 C2	LCT	.32408633 03	RST	.15118361 09	VST	.26401807 02
EPS	.15759842 C3	ESP	.52804401-01	SEP	.22349725 C2	EPM	.16378347 03	EMP	.16062141 02	MEP	.15418813 00
MPS	.34770263 C2	MSP	.98911702-02	SMP	.14522898 C3	SEM	.22446215 02	EMS	.15750123 03	ESM	.53722807-01
RPM	.35040076 C4	SPN	.15656273 C3								
GCE	.86049765 C2	GCT	.28857230 C3	SIP	.50326271 C1	CPT	.70217363 02	SIN	.40479726 02		
REP	.35980714 C6	VEP	.26118355 CC	CPE	.98898098 C2	CPS	.78746299 02				

SELENOCENTRIC — EQUATORIAL COORDINATES

X	.10395717 C4	Y	-.31504982 04	Z	-.10090001 C4	DX	.88372715 00	DY	.33821253 00	DZ	.36109416 00
R	.35040076 C4	DEC	-.16735625 02	RA	.28804735 C3	V	.10127933 01	PTH	-.85026377 01	AZ	.70640954 02
R	.35040070 C4	LAT	.43805426 C1	LON	.34324684 C3	VP	.10038022 01	PTP	-.85793681 01	AZP	.78493116 02
LTS	.14938298 C1	LNS	.19754440 C3	LTE	-.60712714 C1	LNE	.35546154 03				
ALT	.17659177 04	SHA	.19983293 C4	ALP	.81423238 C1	DR	-.14974648 00	DP	.16378671-01	ASD	.29737637 02
HGE	.20240157 C3	SVL	.12617817 C2	HNG	.32671953 C2	SIA	.13404583 03				

SELENOCENTRIC CONIC

EPOCH OF PERICENTER PASSAGE 235764115561202335733000 J.D.= 2439352.49043673 AUG. 14,1966 23 46 13.734

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC)

(a) Case 24: 9-minute arc of 2- and 3-way tracking

ITERATION NUMBER 4 EPOCH 66/08/14 221922.013 CLOCK L25140 SCS .10306 00 OSOS .33966 00

X 2134036154371603355541037 Y 6146166535455616167417 74 Z 6127703063575571365343 44
DX 2007051236301451004503 20 DY 1775324637441440017320 77 DZ 1775626776301447022535 74
OCCCCC 2344352542220000000000000

C	DC	STDEVCQ	APRIORI STDEVDQ	OLD C	NEW Q	NOMINAL Q	DQ(NOM)
X	.87430292-03	.19873193 01	.40000000 01	.10391051 04	.10391059 04	.10401716 04	-.10656433 01
Y	.73887640-04	.10397555 01	.40000000 01	-.31906828 04	-.31906828 04	-.31898982 04	-.78457642 00
Z	.17159477-02	.35315787 01	.40000000 01	-.10087770 04	-.10087752 04	-.10084001 04	-.37516785 00
DX	.43099084-06	.34923667-02	.59999999-02	.88508485 00	.88508528 00	.88572713 00	-.64184516-03
DY	.22072383-07	.32859271-03	.59999999-02	.33847796 00	.33847798 00	.34021251 00	-.17345249-02
DZ	.43343806-06	.35416508-02	.59999999-02	.36218180 00	.36218223 00	.36309415 00	-.91191752-03

* DIFFERENCES

ACQUISITION

TIME= 0. HRS

RA -0.11425000E 03 VEL 0.54520264E 01 GAM -0.11488199E-02 PSI -0.31214714E-01 RAS -0.85372925E-02
* DE 0.36687851E-02 ALT -0.11431250E 03 ROP 0.30700437E 05 SMA 0.17150500E 05 ECC -0.20601936E-02
* IN 0.20816789E-01 M M -0.28060913E 00 ASN -0.63407898E-01 AOP -0.86935997E-01 TAN 0.44004992E-02
* D 0.18018164E 04 DV 0.57754675E 01
*

END OF TRACK

TIME= 0.16666666E 00 HRS

RA -0.70125000E 02 VEL 0.52019653E 01 GAM 0.35711169E-01 PSI -0.33319473E-01 RAS 0.52185059E-02
* DE 0.14987777E-01 ALT -0.70125000E 02 ROP 0.30644688E 05 SMA 0.17120750E 05 ECC -0.20563304E-02
* IN 0.20861195E-01 M M -0.28010178E 00 ASN -0.63514709E-01 AOP -0.11391449E 00 TAN 0.48135445E-02
* D 0.39763944E 04 DV 0.57715169E 01

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(a) Case 24: 9-minute arc of 2- and 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.19479855 03	-.66103034 03	-.13071678 03	.37191870 07	-.58750986 07	-.31665141 07
Y	-.66103034 03	.22640368 04	.44947823 03	-.13294389 08	.20981720 08	.11323672 08
Z	-.13071678 03	.44947823 03	.89476910 02	-.26982796 07	.42571903 07	.22986851 07
DX	.37191870 07	-.13294389 08	-.26982796 07	.10738463 12	-.16881110 12	-.91616228 11
DY	-.58750986 07	.20981720 08	.42571903 07	-.16881110 12	.26543826 12	.14401530 12
DZ	-.31665141 07	.11323672 08	.22986851 07	-.91616228 11	.14401530 12	.78164543 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99537516 00	.99010897 00	-.81317514 00	.81703477 00	.81149092 00
Y	.99537516 00	-.10000000 01	-.99864570 00	.85262013 00	-.85588928 00	-.85121767 00
Z	.99010897 00	-.99864570 00	-.10000000 01	.87048323 00	-.87354608 00	-.86919874 00
DX	-.81317514 00	.85262013 00	.87048323 00	-.10000000 01	.99988071 00	.99999183 00
DY	.81703477 00	-.85588928 00	-.87354608 00	.99988071 00	-.10000000 01	-.99982037 00
DZ	.81149092 00	-.85121767 00	-.86919874 00	.99999183 00	-.99982037 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.39494378 01	.16226432 01	-.23915902 01	-.50047728-02	-.37476683-03	-.51803163-02
Y	.16226432 01	.10810999 01	-.31120242 01	-.11920554-02	-.73038466-04	-.12619954-02
Z	-.23915902 01	-.31120242 01	.12474874 02	-.10866402-02	-.16934218-03	-.97455033-03
DX	-.50047728-02	-.11920554-02	-.10866402-02	.12196835-04	.10609867-05	.12342914-04
DY	-.37476683-03	-.73038466-04	-.16934218-03	.10609867-05	.10797317-06	.10450190-05
DZ	-.51803163-02	-.12619954-02	-.97455033-03	.12342914-04	.10450190-05	.12543291-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(a) Case 24: 9-minute arc of 2- and 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.39494378 01	.16226432 01	-.23915902 01	-.50047728-02	-.37476683-03	-.51803163-02
Y	.16226432 01	.10810999 01	-.31120242 01	-.11920554-02	-.73038466-04	-.12619954-02
Z	-.23915902 01	-.31120242 01	.12474874 02	-.10866402-02	-.16934218-03	-.97455033-03
DX	-.50047728-02	-.11920554-02	-.10866402-02	.12156835-04	.10609867-05	.12342914-04
DY	-.37476683-03	-.73038466-04	-.16934218-03	.10609867-05	.10797317-06	.10450190-05
DZ	-.51803163-02	-.12619954-02	-.97455033-03	.12342914-04	.10450190-05	.12543291-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	.78527632 00	-.34072268 00	-.72109611 00	-.57389913 00	-.73600861 00
Y	.78527632 00	.10000000 01	-.84740686 00	-.32827662 00	-.21377691 00	-.34270395 00
Z	-.34072268 00	-.84740686 00	.10000000 01	-.88093552-01	-.14591137 00	-.77907711-01
DX	-.72109611 00	-.32827662 00	-.88093552-01	.10000000 01	.92454582 00	.99790318 00
DY	-.57389913 00	-.21377691 00	-.14591137 00	.92454582 00	.10000000 01	.89796729 00
DZ	-.73600861 00	-.34270395 00	-.77907711-01	.99790318 00	.89796729 00	.10000000 01

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(a) Case 24: 9-minute arc of 2- and 3-way tracking

STATION NUMBER 41 66/08/14 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045530.0

TIME H M S	TC C	CC3	C3	
221932	60 12	-.88424461 03	.106 00	.0025
222032	60 12	-.51849224 03	.106 00	.0168
222132	60 12	-.14984957 03	.106 00	-.0092
222232	60 12	.22168993 03	.106 00	.0013
222332	60 12	.59613097 03	.106 00	-.0064
222432	60 12	.97347894 03	.105 00	.0123
222532	60 12	.13537357 04	.105 00	-.0112
222632	60 12	.17369038 04	.105 00	-.0126
222732	60 12	.21229835 04	.105 00	.0077
222832	60 12	.25119726 04	.105 00	.0019

DATA STATISTICS STATION 41 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
05/226	C3	8/14-221932	8/14-222832	10	.956-02	.957-02	.321-03	.915-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(a) Case 24: 9-minute arc of 2- and 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME H M S	TC	C	CC3			
221932	60	12	.34042025	04	.101 00	-.0025
222032	60	12	.37654397	04	.101 00	-.0064
222132	60	12	.41374517	04	.101 00	.0066
222232	60	12	.45082444	04	.101 00	-.0028
222332	60	12	.48818226	04	.101 00	.0024
222432	60	12	.52581903	04	.101 00	-.0070
222532	60	12	.56373499	04	.101 00	.0001
222632	60	12	.60193028	04	.101 00	-.0028
222732	60	12	.64040483	04	.101 00	.0016
222832	60	12	.67915843	04	.101 00	.0073

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-221932	8/14-222832	10	.464-02	.465-02	-.357-03	.217-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(b) Case 25: 19-minute arc of 2- and 3-way tracking

ITERATION NUMBER 3 EPOCH 66/08/14 221922.013 CLOCK L25140 SCS .14403 00 QSOS .53402 00

X	21340370764316074434345 6	Y	61461664331356102621501 2	Z	61277031546155703165505 4
DX	20070440645514540534417 7	DY	17753236745714471767655 4	DZ	17756144210214424346063 4
OCCOCC	23443525422200000000000				

Q	CC	STDEVCC	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	.71111876-03	.10809020 01	.40000000 01	.10395604 04	.10395611 04	.10401716 04	-.61050415 00
Y	.27378354-03	.70630638 00	.40000000 01	-.31905533 04	-.31905530 04	-.31898982 04	-.65487671 00
Z	-.38463542-03	.24470542 01	.40000000 01	-.10098027 04	-.10088031 04	-.10084001 04	-.40301514 00
DX	-.55921229-06	.66228627-03	.59999999-02	.88381475 00	.88381419 00	.88572713 00	-.19129365-02
DY	-.47548224-07	.12515091-03	.59999999-02	.33836292 00	.33836287 00	.34021251 00	-.18496401-02
DZ	-.56714027-06	.71730472-03	.59999999-02	.36090551 00	.36090494 00	.36309415 00	-.21892078-02

*

DIFFERENCES

ACQUISITION

TIME= 0. HRS

RA	-0.32759000E 02	VEL	0.19262695E 00	GAM	-0.20593405E-02	PSI	0.13676643E-01	RAS	-0.46157837E-03
* DE	0.33144951E-02	ALT	-0.32750000E 02	ROP	0.89950000E 03	SMA	0.56850000E 03	ECC	-0.55387616E-04
* IN	-0.12229919E-01	M M	-0.93243738E-02	ASN	0.15579224E-01	AOP	-0.17503738E-01	TAN	0.23574755E-03
* D	0.67174374E 03	DV	0.84274785E 00						

*

END OF TRACK

TIME= 0.33333333E 00 HRS

RA	-0.13612500E 03	VEL	0.20849609E 00	GAM	0.56517124E-03	PSI	0.13275146E-01	RAS	0.26321411E-02
* DE	-0.80299377E-03	ALT	-0.13612500E 03	ROP	0.84500000E 03	SMA	0.53312500E 03	ECC	-0.52340329E-04
* IN	-0.12115240E-01	M M	-0.86936951E-02	ASN	0.15411377E-01	AOP	-0.17630577E-01	TAN	0.26553869E-03
* D	0.52364246E 03	DV	0.85025320E 00						

*

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(b) Case 25: 19-minute arc of 2- and 3-way tracking

J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.34429727 04	-.83224886 04	-.13848513 04	.23334116 08	-.37210543 08	-.18838360 08
Y	-.83224886 04	.20506215 05	.34536033 04	-.60742974 08	.96785987 08	.49366929 08
Z	-.13848513 04	.34536033 04	.58626144 03	-.10591560 08	.16870815 08	.86409626 07
DX	.23334116 08	-.60742974 08	-.10591560 08	.23420861 12	-.37144156 12	-.19386784 12
DY	-.37210543 08	.96785987 08	.16870815 08	-.37144156 12	.58923784 12	.30738758 12
DZ	-.18838360 08	.49366929 08	.86409626 07	-.19386784 12	.30738758 12	.16070158 12

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99047534 00	.97474428 00	-.82171863 00	.82614050 00	.80087776 00
Y	.99047534 00	-.10000000 01	-.99605663 00	.87649989 00	-.88048998 00	-.85996997 00
Z	.97474428 00	-.99605663 00	-.10000000 01	.90388432 00	-.90770579 00	-.89023854 00
DX	-.82171863 00	.87649989 00	.90388432 00	-.10000000 01	.99987049 00	.99929627 00
DY	.82614050 00	-.88048998 00	-.90770579 00	.99987049 00	-.10000000 01	-.99892052 00
DZ	.80087776 00	-.85996997 00	-.89023854 00	.99929627 00	-.99892052 00	-.10000000 01

J INVERSE ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.11683490 01	.65434007 00	-.15023202 01	-.51239558-03	.25272226-04	-.64975638-03
Y	.65434007 00	.49886871 00	-.15711543 01	-.13111246-03	.40501999-04	-.22770738-03
Z	-.15023202 01	-.15711543 01	.59882703 01	-.19829785-03	-.18601216-03	.10112936-03
DX	-.51239558-03	-.13111246-03	-.19829785-03	.43862311-06	.34122270-07	.45475323-06
DY	.25272226-04	.40501999-04	-.18601216-03	.34122270-07	.15662751-07	.11727500-07
DZ	-.64975638-03	-.22770738-03	.10112936-03	.45475323-06	.11727500-07	.51452607-06

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(b) Case 25: 19-minute arc of 2- and 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.11683450 01	.65434007 00	-.15023202 01	-.51239558-03	.25272226-04	-.64975638-03
Y	.65434007 00	.49886871 00	-.15711543 01	-.13111246-03	.40501999-04	-.22770738-03
Z	-.15023202 01	-.15711543 01	.59882703 01	-.19829785-03	-.18601216-03	.10112936-03
DX	-.51239558-03	-.13111246-03	-.19829785-03	.43862311-06	.34122270-07	.45475323-06
DY	.25272226-04	.40501999-04	-.18601216-03	.34122270-07	.15662751-07	.11727500-07
DZ	-.64975638-03	-.22770738-03	.10112936-03	.45475323-06	.11727500-07	.51452607-06

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 3

	X	Y	Z	DX	DY	DZ
X	.10000000 01	.85708536 00	-.56797014 00	-.71576971 00	.18681992 00	-.83803192 00
Y	.85708536 00	.10000000 01	-.90902329 00	-.28028836 00	.45819391 00	-.44944887 00
Z	-.56797014 00	-.90902329 00	.10000000 01	-.12235495 00	-.60737460 00	.57613315-01
DX	-.71576971 00	-.28028836 00	-.12235495 00	.10000000 01	.41167846 00	.95725214 00
DY	.18681992 00	.45819391 00	-.60737460 00	.41167846 00	.10000000 01	.13063746 00
DZ	-.83803192 00	-.44944887 00	.57613315-01	.95725214 00	.13063746 00	.10000000 01

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(b) Case 25: 19-minute arc of 2- and 3-way tracking

STATION NUMBER 41 66/08/14 ITERATION NUMBER 3 PASS NUMBER 05/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3	C3	
221932	60	12		-.88424248 03 .106 00	.0004
222032	60	12		-.51848750 03 .106 00	.0121
222132	60	12		-.14984490 03 .106 00	-.0139
222232	60	12		.22169243 03 .106 00	-.0012
222332	60	12		.59613055 03 .106 00	-.0060
222432	60	12		.97347553 03 .105 00	.0157
222532	60	12		.13537307 04 .105 00	-.0062
222632	60	12		.17368996 04 .105 00	-.0083
222732	60	12		.21229834 04 .105 00	.0078
222832	60	12		.25119816 04 .105 00	-.0071
222932	60	12		.29038921 04 .105 00	-.0009
223032	60	12		.32987101 04 .105 00	.0144
223132	60	12		.36964279 04 .105 00	-.0034
223232	60	12		.40970351 04 .105 00	-.0106
223332	60	12		.45005180 04 .105 00	.0065
223432	60	12		.49068594 04 .105 00	-.0015
223532	60	12		.53160375 04 .105 00	.0037
223632	60	12		.57280262 04 .104 00	-.0016
223732	60	12		.61427941 04 .104 00	-.0029
223832	60	12		.65603040 04 .104 00	.0038

DATA STATISTICS STATION 41 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
05/226	C3	8/14-221932	8/14-223832	20	.793-02	.793-02	.420-04	.629-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(b) Case 25: 19-minute arc of 2- and 3-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 3 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	C	CC3	
221932	60	12	.34042002 C4 .101 00	-.0002
222032	60	12	.37694404 04 .101 00	-.0070
222132	60	12	.41374529 C4 .101 00	.0054
222232	60	12	.45082439 C4 .101 00	-.0023
222332	60	12	.48818198 C4 .101 00	.0052
222432	60	12	.52581850 C4 .101 00	-.0017
222532	60	12	.56373437 C4 .101 00	.0062
222632	60	12	.60192977 C4 .101 00	.0023
222732	60	12	.64040481 C4 .101 00	.0018
222832	60	12	.67915939 C4 .101 00	-.0023
222932	60	12	.71819315 C4 .101 00	-.0066
223032	60	12	.75750566 C4 .101 00	.0017
223132	60	12	.79709601 C4 .101 00	-.0018
223232	60	12	.83696313 C4 .101 00	.0020
223332	60	12	.87710550 C4 .101 00	-.0050
223432	60	12	.91752134 C4 .101 00	.0033
223532	60	12	.95820843 C4 .101 00	-.0010
223632	60	12	.99916400 C4 .101 00	-.0067
223732	60	12	.10403848 C5 .101 00	.0017
223832	60	12	.10818672 C5 .101 00	.0023

DATA STATISTICS STATION 12 ITERATION 3

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-221932	8/14-223832	20	.397-02	.397-02	-.885-04	.158-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(c) Case 26: 76-minute arc of 2-way tracking with 69 minutes of 3-way tracking

```
ITERATION NUMBER     4      EPOCH  66/08/14  221922.012    CLOCK  12514C    SCS  .25119 02    QSCS  .25500 02

  X   21340374252416C211356323      Y   61461663370756161246603C      Z   61277033576455734603177 7
 DX   20C704401457145271545324     DY   17753240675514471557032C     DZ   17756136504214432635157 3
0000C 23443525422200000000000C

C          CC          STDEVDQ        APRIORI STDEVDQ        OLD C          NEW C          NOMINAL Q        DQ(NCM)

 X    .15119425-C3   .74441656-C1   .40000000 01    .10397706 04    .10397708 04    .10401716 04   -.40C77209 00
 Y   -.11071C36-C5   .25713331-C1   .40000000 01   -.31904357 04   -.31904357 04   -.31898982 04   -.53756714 00
 Z    .13303602-C3   .91747981-C1   .40000000 01   -.10088671 04   -.10088671 04   -.10084001 04   -.467CC287 00
DX    .17301783-C7   .16961189-C4   .59999999-02    .88379512 00    .88379513 00    .88572713 00   -.19319951-02
DY    .10244674-C6   .65522728-C4   .59999999-02    .33839209 00    .33839219 00    .34021251 00   -.18203221-02
DZ   -.16233780-C6   .10056C71-C3   .59999999-02    .36081915 00    .36081899 00    .363C9415 00   -.22751577-02

*                                                    DIFFERENCES
                                                     ACQUISITION
     TIME= 0. HRS
  RA  -0.11862500E 03 VEL  0.69752148E-01 GAM  0.42128563E-03 PSI  0.17677307E-01 RAS  0.35629272E-02
* DE   0.29930767E-02 ALT -0.11868750E 03 ROP  0.26218750E 03 SMA  0.72500000E 02 ECC -0.23316592E-04
* IN  -0.14416456E-01 M M -0.11911392E-02 ASN  0.27873993E-01 ASP -0.16877174E-01 TAN  0.24069110E-04
*  D   0.81189092E 03  DV  0.11012048E 01
*
*                                                    END OF TRACK
     TIME= 0.12666667E 01 HRS
  RA   0.22875000E 03 VEL  0.13567627E 00 GAM -0.19544363E-03 PSI -0.64344406E-02 RAS  0.72522163E-02
* DE  -0.15410185E-01 ALT  0.22371875E 03 ROP  0.27393750E 03 SMA  0.15880000E 04 ECC  0.91679394E-04
* IN  -0.14453898E-01 M M -0.26011467E-01 ASN  0.26667919E-01 ASP -0.18675804E-01 TAN  0.12031943E-03
*  D   0.19409327E 04  DV  0.13135379E 01
*
```

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(c) Case 26: 76-minute arc of 2-way tracking with 69 minutes of 3-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.53393431 06	-.53901079 06	.17704204 04	.15793956 10	-.10789749 10	-.50987894 08
Y	-.53901079 06	.59006577 06	.20332731 05	-.15859229 10	.12467536 10	.17222293 09
Z	.17704204 04	.20332731 05	.12579470 05	.20432023 08	.57590599 08	.51887999 08
DX	.15793956 10	-.15859229 10	.20432023 08	.48728197 13	-.33668482 13	-.21947507 12
DY	-.10789749 10	.12467536 10	.57590599 09	-.33668482 13	.29893924 13	.64613152 12
DZ	-.50987894 08	.17222293 09	.51887999 08	-.21947507 12	.64613152 12	.38628072 12

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.96027577 00	-.21602366-01	-.97916715 00	.85403561 00	.11227205 00
Y	.96027577 00	-.10000000 01	-.23599727 00	.93526425 00	-.93871035 00	-.36072969 00
Z	-.21602366-01	-.23599727 00	-.99999999 00	-.82525855-01	-.29698120 00	-.74436209 00
DX	-.97916715 00	.93526425 00	-.82525855-01	-.10000000 01	.88214891 00	.15997183 00
DY	.85403561 00	-.93871035 00	-.29698120 00	.88214891 00	-.10000000 01	-.60128164 00
DZ	.11227205 00	-.36072969 00	-.74436209 00	.15997183 00	-.60128164 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.55415662-02	.32573556-03	.55148073-02	.10334359-05	.44301315-05	-.69776530-05
Y	.32573556-03	.66117539-03	-.99631939-03	-.13879911-06	-.39590571-06	.46541344-06
Z	.55148073-02	-.99631939-03	.34176923-02	.14132306-05	.57215889-05	-.87261145-05
DX	.10334359-05	-.13879911-06	.14132306-05	.28769193-09	.10815284-08	-.16371595-08
DY	.44301315-05	-.39590571-06	.57215889-05	.10815284-08	.42932280-08	-.65740689-08
DZ	-.69776530-05	.46541344-06	-.87261145-05	-.16371595-08	-.65740689-08	.10112457-07

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(c) Case 26: 76-minute arc of 2-way tracking with 69 minutes of 3-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.55415662-02	.32573556-03	.55148073-02	.10334359-05	.44301315-05	-.69776530-05
Y	.32573556-03	.66117539-03	-.99631939-03	-.13879911-06	-.39590571-06	.46541344-06
Z	.55148073-02	-.99631939-03	.84176923-02	.14132306-05	.57215889-05	-.87261145-05
DX	.10334359-05	-.13879911-06	.14132306-05	.28768193-09	.10815284-08	-.16371595-08
DY	.44301315-05	-.39590571-06	.57215889-05	.10815284-08	.42932280-08	-.65740689-08
DZ	-.69776530-05	.46541344-06	-.87261145-05	-.16371595-08	-.65740689-08	.10112457-07

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	.17017297 00	.80745357 00	.81848551 00	.90825622 00	-.93210482 00
Y	.17017297 00	.99999999 00	-.42232201 00	-.31825266 00	-.23498571 00	.17999160 00
Z	.80745357 00	-.42232201 00	.99999999 00	.90815549 00	.95176154 00	-.94579285 00
DX	.81848551 00	-.31825266 00	.90815549 00	.99999999 00	.97317209 00	-.95985659 00
DY	.90825622 00	-.23498571 00	.95176154 00	.97317209 00	.10000000 01	-.99773204 00
DZ	-.93210482 00	.17999160 00	-.94579285 00	-.95985659 00	-.99773204 00	.10000000 01

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(c) Case 26: 76-minute arc of 2-way tracking with 69 minutes of 3-way tracking

STATION NUMBER 41 66/06/14 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY 2045530.0

TIME H M S	TC	Q	CC3	C3	
221932	60	12	-.88431235 03	.106 00	.0703
222032	60	12	-.51854546 03	.106 00	.0701
222132	60	12	-.14989188 03	.106 00	.0331
222232	60	12	.22165572 03	.106 00	.0355
222332	60	12	.59610345 03	.106 00	.0211
222432	60	12	.97345728 03	.105 00	.0339
222532	60	12	.13537205 04	.105 00	.0040
222632	60	12	.17368967 04	.105 00	-.0055
222732	60	12	.21229875 04	.105 00	.0037
222832	60	12	.25119916 04	.105 00	-.0170
222932	60	12	.29039074 04	.105 00	-.0163
223032	60	12	.32987301 04	.105 00	-.0056
223132	60	12	.36964519 04	.105 00	-.0273
223232	60	12	.40970625 04	.105 00	-.0380
223332	60	12	.45005482 04	.105 00	-.0237
223432	60	12	.49068918 04	.105 00	-.0339
223532	60	12	.53160714 04	.105 00	-.0302
223632	60	12	.57280613 04	.104 00	-.0369
223732	60	12	.61428300 04	.104 00	-.0388
223832	60	12	.65603398 04	.104 00	-.0320
223932	60	12	.69805479 04	.104 00	-.0400
224032	60	12	.74034043 04	.104 00	-.0465
224132	60	12	.78288517 04	.104 00	-.0272
224232	60	12	.82568234 04	.104 00	-.0156
224332	60	12	.86872447 04	.104 00	-.0201
224432	60	12	.91200300 04	.104 00	-.0055
224532	60	12	.95550831 04	.104 00	.0081
224632	60	12	.99922961 04	.104 00	-.0049
224732	60	12	.10431546 05	.104 00	.0115
224832	60	12	.10872699 05	.104 00	.0251
224932	60	12	.11315602 05	.104 00	.0389
225032	60	12	.11760087 05	.104 00	.0375
225132	60	12	.12205965 05	.104 00	.0597
225232	60	12	.12653027 05	.104 00	.0637
225332	60	12	.13101045 05	.104 00	.0625
225432	60	12	.13549761 05	.104 00	.0801

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(c) Case 26: 76-minute arc of 2-way tracking with 69 minutes of 3-way tracking

FREQUENCY2045750.C

H M S								
230532	60	12	.18427373	05	.103	00	.0642
230632	60	12	.18852280	05	.103	00	.0576
230732	60	12	.19271137	05	.103	00	.0505
230832	60	12	.19683040	05	.103	00	.0305
230932	60	12	.20087012	05	.103	00	.0088
231032	60	12	.20481992	05	.103	00	-.0046
231132	60	12	.20866838	05	.103	00	-.0176
231232	60	12	.21240318	05	.103	00	-.0303
231332	60	12	.21601106	05	.103	00	-.0515
231432	60	12	.21947780	05	.103	00	-.0417
231532	60	12	.22278818	05	.103	00	-.0471
231632	60	12	.22592598	05	.103	00	-.0603
231732	60	12	.22887389	05	.103	00	-.0513
231832	60	12	.23161362	05	.103	00	-.0576
231932	60	12	.23412578	05	.103	00	-.0566
232132	60	12	.23838504	05	.103	00	-.0496
232232	60	12	.24008862	05	.103	00	-.0247
232332	60	12	.24147778	05	.103	00	-.0068
232432	60	12	.24252889	05	.103	00	.0315
232532	60	12	.24321784	05	.103	00	.0366
232632	60	12	.24352023	05	.103	00	.0649
232732	60	12	.24341163	05	.103	00	.1077
232832	60	12	.24286769	05	.103	00	.1150

DATA STATISTICS STATION 41 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
05/226	C3	8/14-221532	8/14-232832	59	.442-01	.444-01	.443-02	.197-02

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(c) Case 26: 76-minute arc of 2-way tracking with 69 minutes of 3-way tracking

STATICN NUMBER 12 66/C8/14 ITERATICN NUMBER 4 PASS NUMBER 04/226

FREQUENCY2C45530.0

TIME H M S	TC	C	CC3			
221932	6C	12	.34041435	C4	.1C1 CC	.0565
222032	6C	12	.37693953	C4	.1C1 CC	.0380
222132	6C	12	.41374186	C4	.1C1 CC	.0398
222232	6C	12	.45082195	C4	.1C1 CC	.0221
222332	6C	12	.48818047	C4	.101 00	.0203
222432	6C	12	.52581785	C4	.1C1 CC	.0048
222532	6C	12	.56373447	C4	.101 CC	.0052
222632	6C	12	.60193C57	C4	.1C1 CC	-.0058
222732	6C	12	.64040627	C4	.1C1 CC	-.0128
222832	6C	12	.67916140	C4	.1C1 CC	-.0223
222932	6C	12	.71819568	C4	.101 CC	-.0319
223C32	6C	12	.75750861	C4	.1C1 CC	-.0277
223132	6C	12	.79709931	C4	.1C1 CC	-.0349
223232	6C	12	.83696672	C4	.1C1 CC	-.0339
223332	6C	12	.87710931	C4	.1C1 CC	-.0431
223432	6C	12	.91752535	C4	.101 CC	-.0369
223532	6C	12	.95821255	C4	.101 00	-.0422
223632	6C	12	.99916617	C4	.1C1 CC	-.0485
223732	6C	12	.1C4C3890	C5	.1C1 00	-.0404
223832	6C	12	.1C818713	C5	.1C1 CC	-.0383
223932	6C	12	.11236106	C5	.1C1 CC	-.0476
224032	6C	12	.11656C16	C5	.101 CC	-.0332
224132	6C	12	.12C78387	C5	.102 00	-.0293
224232	6C	12	.12503151	C5	.1C2 00	-.0258
224332	6C	12	.12930230	C5	.1C2 00	-.0212
224432	6C	12	.13359538	C5	.1C2 CC	-.0127
224532	60	12	.13790578	C5	.1C2 CC	-.0028
224632	6C	12	.14224439	05	.102 00	.0109
224732	6C	12	.14659798	C5	.1C2 00	.0100
224832	6C	12	.15096919	C5	.1C2 CC	.0225
224932	60	12	.15535647	C5	.1C2 CC	.0365
225C32	6C	12	.15975811	C5	.1C2 CC	.0472
225132	6C	12	.16417221	C5	.1C2 CC	.0537
225232	6C	12	.16859667	C5	.102 00	.0659

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(c) Case 26: 76-minute arc of 2-way tracking with 69 minutes of 3-way tracking

FREQUENCY2045750.C

H M S						
230432	60	12	.22135992	C5	.102 00	.0911
230532	60	12	.22559321	C5	.102 00	.0793
230632	60	12	.22977241	C5	.102 00	.0588
230732	60	12	.23388917	C5	.102 00	.0493
230832	60	12	.23793441	C5	.102 00	.0339
230932	60	12	.24189831	C5	.102 00	.0193
231032	60	12	.24577024	C5	.102 00	.0005
231132	60	12	.24953873	C5	.102 00	-.0149
231232	60	12	.25319140	C5	.102 00	-.0234
231332	60	12	.25671498	C5	.102 00	-.0398
231432	60	12	.26009520	C5	.102 00	-.0452
231532	60	12	.26331681	C5	.102 00	-.0559
231632	60	12	.26636353	C5	.102 00	-.0527
231732	60	12	.26921804	C5	.102 00	-.0461
231832	60	12	.27186200	C5	.102 00	-.0583
231932	60	12	.27427601	C5	.102 00	-.0684
232032	60	12	.27643972	C5	.102 00	-.0549
232132	60	12	.27833176	C5	.103 00	-.0518
232232	60	12	.27992995	C5	.103 00	-.0452
232332	60	12	.28121128	C5	.103 00	-.0276
232532	60	12	.28272645	C5	.103 00	.0134
232632	60	12	.28291583	C5	.103 00	.0339
232732	60	12	.28268991	C5	.103 00	.0591
232832	60	12	.28202660	C5	.103 00	.0569
232932	60	12	.28090238	C5	.103 00	.0703
233032	60	12	.27929477	C5	.103 00	.0649
233132	60	12	.27718264	C5	.103 00	.0610
233232	60	12	.27454672	C5	.103 00	.0356
233332	60	12	.27137010	C5	.103 00	-.0017
233432	60	12	.26763860	C5	.103 00	-.0764
233532	60	12	.26334142	C5	.103 00	-.1753

DATA STATISTICS — STATION 12 — ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-221932	8/14-233532	65	.477-01	.479-01	-.412-02	.230-02

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(d) Case 27: 9-minute arc of 2-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  221922.013    CLOCK  L25140    SOS  .34528-01    QSOS  .14866 00

  X   213403754773160570633510      Y   614616645435561164602302      Z   612770253051557104255166
 DX   200705570712145164605062     DY   177533436235144176354713     DZ   177562341515144124276324
000000 234435254222000000000000

C          DC          STDEVDC        APRIORI          OLD C          NEW Q          NOMINAL Q        DC(NCM)
                                      STDEVDQ

 X   -.55312253-04   .30101255 01   .40000000 01    .10398516 04    .10398515 04    .10401716 04   -.32009888 00
 Y   -.67745639-04   .11351347 01   .40000000 01   -.31905868 04   -.31905868 04   -.31898982 04   -.68862915 00
 Z   -.48428030-04   .38410551 01   .40000000 01   -.10086682 04   -.10086683 04   -.10084001 04   -.26818848 00
DX    .82747761-06   .48704517-02   .55555555-02    .88620254 00    .88620336 00    .88572713 00    .47623365-03
DY    .42447773-06   .25852632-02   .55555555-02    .33941285 00    .33941327 00    .34021251 00   -.79923495-03
DZ    .19121055-06   .40597472-02   .55555555-02    .36175833 00    .36175852 00    .36309415 00   -.13356283-02

*                                                    DIFFERENCES
                                                     ACQUISITION
      TIME= 0.HRS
   RA   0.22352550E 03 VEL  0.91816711E 01 GAM -0.21011637E-02 PSI  0.21290779E-01 RAS  0.40740967E-02
 * DE   0.60000420E-02 ALT  0.22356250E 03 ROP  0.52336312E 05 SMA  0.29458750E 05 ECC -0.34903735E-02
 * IN  -0.19570827E-01 M M -0.48117352E 00 ASN  0.27683258E-01 AOP -0.22904491E 00 TAN  0.75083338E-02
 *  D   0.14533054E 04  DV  0.92881554E 01
 *
                                                     END OF TRACK
      TIME= 0.16666666E 00 HRS
   RA   0.30387500E 03 VEL  0.87545166E 01 GAM  0.60556769E-01 PSI  0.15556335E-01 RAS  0.31879425E-01
 * DE   0.12850285E-01 ALT  0.30387500E 03 ROP  0.52278687E 05 SMA  0.29429375E 05 ECC -0.34862757E-02
 * IN  -0.19514084E-01 M M -0.48066235E 00 ASN  0.27580261E-01 AOP -0.26449108E 00 TAN  0.82012787E-02
 *  D   0.65362989E 04  DV  0.90383493E 01
 *
```

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(d) Case 27: 9-minute arc of 2-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10430780 03	-.34894045 03	-.69413034 02	.19532357 07	-.31260357 07	-.16589132 07
Y	-.34894045 03	.11778539 04	.23511531 03	-.68701752 07	.10988228 08	.58372647 07
Z	-.69413034 02	.23511531 03	.47066376 02	-.13966500 07	.22332117 07	.11868588 07
DX	.19532357 07	-.68701752 07	-.13966500 07	.55135167 11	-.87858786 11	-.46927445 11
DY	-.31260357 07	.10988228 08	.22332117 07	-.87858786 11	.14000975 12	.74778289 11
DZ	-.16589132 07	.58372647 07	.11868588 07	-.46927445 11	.74778289 11	.39942053 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99551361 00	.99066601 00	-.81448277 00	.81800583 00	.81273708 00
Y	.99551361 00	-.10000000 01	-.99857301 00	.85252622 00	-.85566308 00	-.85103706 00
Z	.99066601 00	-.99857301 00	-.10000000 01	.86699750 00	-.86995219 00	-.86562241 00
DX	-.81448277 00	.85252622 00	.86699750 00	-.10000000 01	.99998093 00	.99999394 00
DY	.81800583 00	-.85566308 00	-.86995219 00	.99998093 00	-.10000000 01	-.99995671 00
DZ	.81273708 00	-.85103706 00	-.86562241 00	.99999394 00	-.99995671 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.90606754 01	.21823771 01	-.11703829 01	.16955388-02	.58250245-02	-.88212012-02
Y	.21823771 01	.12885308 01	-.34671466 01	-.58937821-03	.36142053-03	-.13637388-02
Z	-.11703829 01	-.34671466 01	.14753705 02	.29241085-03	.15890687-02	-.26117642-02
DX	.16955388-02	-.58937821-03	.29241085-03	.23721300-04	.10681698-04	.80197904-05
DY	.58250245-02	.36142053-03	.15890687-02	.10681698-04	.83117967-05	-.39926985-05
DZ	-.88212012-02	-.13637388-02	-.26117642-02	.80197904-05	-.39926985-05	.16807927-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(d) Case 27: 9-minute arc of 2-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.90608794 01	.21823771 01	-.11703829 01	.16955388-02	.58250245-02	-.88212012-02
Y	.21823771 01	.12885308 01	-.34671466 01	-.58937821-03	.36142053-03	-.13637388-02
Z	-.11703829 01	-.34671466 01	.14753705 02	.29241085-03	.15890687-02	-.26117642-02
DX	.16955388-02	-.58937821-03	.29241085-03	.23721300-04	.10681698-04	.80197904-05
DY	.58250245-02	.36142053-03	.15890687-02	.10681698-04	.89117967-05	-.39926985-05
DZ	-.88212012-02	-.13637388-02	-.26117642-02	.80197904-05	-.39926985-05	.16807927-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.99999999 00	.63870045 00	-.10122603 00	.11565204 00	.64823123 00	-.71480153 00
Y	.63870045 00	.10000000 01	-.79519615 00	-.10660496 00	.10665538 00	-.29303988 00
Z	-.10122603 00	-.79519615 00	.10000000 01	.15630530-01	.13858286 00	-.16585415 00
DX	.11565204 00	-.10660496 00	.15630530-01	.10000000 01	.73466346 00	.40163976 00
DY	.64823123 00	.10665538 00	.13858286 00	.73466346 00	.10000000 01	-.32623218 00
DZ	-.71480153 00	-.29303988 00	-.16585415 00	.40163976 00	-.32623218 00	.10000000 01

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(d) Case 27: 9-minute arc of 2-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	C	CC3			
221932	60	12	.34042019	04	.101	00	-.0020
222032	60	12	.37654358	04	.101	00	-.0025
222132	60	12	.41374473	04	.101	00	.0110
222232	60	12	.45082409	04	.101	00	.0007
222332	60	12	.48818215	04	.101	00	.0035
222432	60	12	.52581915	04	.101	00	-.0082
222532	60	12	.56373533	04	.101	00	-.0034
222632	60	12	.60193068	04	.101	00	-.0068
222732	60	12	.64040511	04	.101	00	-.0012
222832	60	12	.67915826	04	.101	00	.0091

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-221932	8/14-222832	10	.595-02	.595-02	.336-04	.354-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(e) Case 28: 19-minute arc of 2-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  221922.013    CLOCK  L25140    SOS  .31932-01    QSOS  .41456 00

  X   21340373774016030130632C      Y   614616642723561331170532      Z   61277025340C557316502377
 DX   20070442316214502470557 2     DY   177532517041144171075354     DZ   177561235401144223057443
CCOOOC 23443525422200000000000C
```

Q	DQ	STDEVDQ	APRIORI STDEVDQ	OLD Q	NEW Q	NOMINAL Q	DQ(NOM)
X	.14491124-03	.29623974 01	.40000000 01	.10397494 04	.10397495 04	.10401716 04	-.42207336 00
Y	.78336030-04	.11105407 01	.40000000 01	-.31905456 04	-.31905455 04	-.31898982 04	-.64730835 00
Z	.58741021-04	.38367560 01	.40000000 01	-.10086700 04	-.10086699 04	-.10084001 04	-.26982880 00
DX	-.10366225-05	.12056833-02	.59999999-02	.88386343 00	.88386239 00	.88572713 00	-.18647387-02
DY	-.54720547-06	.22907741-02	.59999999-02	.33853026 00	.33852971 00	.34021251 00	-.16827953-02
DZ	-.19849407-06	.34205235-02	.59999999-02	.36065217 00	.36065197 00	.36309415 00	-.24421736-02

```
*                                                    DIFFERENCES
                                                     ACQUISITION
      TIME= 0. HRS
   RA   0.25000000E 01 VEL  0.21786499E 00 GAM -0.21295547E-02 PSI  0.29758453E-01 RAS  0.26359558E-02
 * DE   0.56414604E-02 ALT  0.25000000E 01 ROP  0.10858750E 04 SMA  0.69237500E 03 ECC -0.66403300E-04
 * IN  -0.25611162E-01 M M -0.11356354E-01 ASN  0.49119171E-01 AOP -0.32544136E-01 TAN  0.26280060E-03
 *  D   0.12401289E 04  DV  0.18396894E 01
 *
                                                     END OF TRACK
      TIME= 0.33333333E 00 HRS
   RA  -0.95750000E 02 VEL  0.22711182E 00 GAM  0.91922283E-03 PSI  0.28712273E-01 RAS  0.80490112E-02
 * DE  -0.38689375E-02 ALT -0.95750000E 02 ROP  0.10309999E 04 SMA  0.65387500E 03 ECC -0.63329935E-04
 * IN  -0.25498152E-01 M M -0.10720253E-01 ASN  0.39951324E-01 AOP -0.29316902E-01 TAN  0.29261410E-03
 *  D   0.16458746E 04  DV  0.17881164E 01
 *
```

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(e) Case 28: 19-minute arc of 2-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.18084216 04	-.43353362 04	-.73095764 03	.12104496 08	-.19529076 08	-.97427777 07
Y	-.43353362 04	.10589905 05	.18062033 04	-.31216745 08	.50338033 08	.25293264 08
Z	-.73095764 03	.18062033 04	.31029863 03	-.55008243 07	.88674675 07	.44736828 07
DX	.12104496 08	-.31216745 08	-.55008243 07	.11983561 12	-.19245918 12	-.98920298 11
DY	-.19529076 08	.50338033 08	.88674675 07	-.19245918 12	.30911791 12	.15884119 12
DZ	-.97427777 07	.25293264 08	.44736828 07	-.98920298 11	.15884119 12	.81772801 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99066520 00	.97571442 00	-.82225005 00	.82598044 00	.80117705 00
Y	.99066520 00	-.10000000 01	-.95639299 00	.87629160 00	-.87980843 00	-.85951687 00
Z	.97571442 00	-.95639299 00	-.10000000 01	.90207969 00	-.90541479 00	-.88811830 00
DX	-.82225005 00	.87629160 00	.90207969 00	-.10000000 01	.99996222 00	.99928194 00
DY	.82598044 00	-.87980843 00	-.90541479 00	.99996222 00	-.10000000 01	-.99907158 00
DZ	.80117705 00	-.85951687 00	-.88811830 00	.99928194 00	-.99907158 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.87757984 01	.20889366 01	-.12605654 01	.11315541-02	.58463781-02	-.95191550-02
Y	.20889366 01	.12333007 01	-.35074114 01	-.34988636-04	.67154391-03	-.12874823-02
Z	-.12605654 01	-.35074114 01	.14720697 02	.41837481-03	.17215693-02	-.27086470-02
DX	.11315541-02	-.34988636-04	.41837481-03	.14536722-05	.19196919-05	-.18476887-05
DY	.58463781-02	.67154391-03	.17215693-02	.19196919-05	.52476460-05	-.74764859-05
DZ	-.95191550-02	-.12874823-02	-.27086470-02	-.18476887-05	-.74764859-05	.11699981-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(e) Case 28: 19-minute arc of 2-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.87757984 01	.20889366 01	-.12605694 01	.11315541-02	.58463781-02	-.95191550-02
Y	.20889366 01	.12333007 01	-.35074114 01	-.24988636-04	.67154391-03	-.12874823-02
Z	-.12605694 01	-.35074114 01	.14720697 02	.41837481-03	.17215693-02	-.27086470-02
DX	.11315541-02	-.24988636-04	.41837481-03	.14536722-05	.19196919-05	-.18476887-05
DY	.58463781-02	.67154391-03	.17215693-02	.19196919-05	.52476460-05	-.74764859-05
DZ	-.95191550-02	-.12874823-02	-.27086470-02	-.18476887-05	-.74764859-05	.11699981-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	.63496158 00	-.11090707 00	.31680992 00	.86151195 00	-.93942583 00
Y	.63496158 00	.99999999 00	-.82316715 00	-.26131194-01	.26397187 00	-.33893325 00
Z	-.11090707 00	-.82316715 00	.10000000 01	.90441570-01	.19587457 00	-.20639332 00
DX	.31680992 00	-.26131194-01	.90441570-01	.99999999 00	.69504994 00	-.44802573 00
DY	.86151195 00	.26397187 00	.19587457 00	.69504994 00	.99999999 00	-.95416319 00
DZ	-.93942583 00	-.33893325 00	-.20639332 00	-.44802573 00	-.95416319 00	.10000000 01

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(e) Case 28: 19-minute arc of 2-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	Q	CC3			
221932	60	12	.34042002	04	.101	00	-.0002
222032	60	12	.37654404	04	.101	00	-.0071
222132	60	12	.41374529	04	.101	00	.0054
222232	60	12	.45082438	04	.101	00	-.0021
222332	60	12	.48818197	04	.101	00	.0052
222432	60	12	.52581851	04	.101	00	-.0018
222532	60	12	.56373437	04	.101	00	.0062
222632	60	12	.60192978	04	.101	00	.0022
222732	60	12	.64040483	04	.101	00	.0016
222832	60	12	.67915941	04	.101	00	-.0025
222932	60	12	.71819319	04	.101	00	-.0069
223032	60	12	.75750569	04	.101	00	.0015
223132	60	12	.79709602	04	.101	00	-.0020
223232	60	12	.83696313	04	.101	00	.0020
223332	60	12	.87710550	04	.101	00	-.0050
223432	60	12	.91752134	04	.101	00	.0033
223532	60	12	.95820840	04	.101	00	-.0006
223632	60	12	.99916393	04	.101	00	-.0061
223732	60	12	.10403848	05	.101	00	.0023
223832	60	12	.10818670	05	.101	00	.0049

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-221932	8/14-223832	20	.405-02	.405-02	.137-04	.164-04

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(f) Case 29: 76-minute arc of 2-way tracking

```
ITERATION  NUMBER     4      EPOCH  66/08/14  221922.013    CLOCK  L25140    SCS  .13357 02    QSDS  .14027 02

  X   21340416074416001125 3511      Y   61461664376556155746 6072      Z   61276751402655770240 5274
 DX   20070451225314556250 5037      DY  17753351075314401442 6131      DZ  17755755071421442570131 03
00000 2344352542220000000000
```

C	CC	STDEVDC	APRIORI STDEVDQ	OLD C	NEW Q	NOMINAL Q	DC(NOM)
X	-.12509456-02	.18610711 01	.40000000 01	.10408836 04	.10408824 04	.10401716 04	.71080017 00
Y	.21999747-03	.21422016 00	.40000000 01	-.31905624 04	-.31905621 04	-.31898982 04	-.66357095 00
Z	-.18670576-02	.26155560 01	.40000000 01	-.10072952 04	-.10072970 04	-.10084001 04	.11030502 01
DX	-.37473869-06	.46286163-03	.59999999-02	.88407300 00	.88407262 00	.88572713 00	-.16545057-02
DY	-.13770447-05	.18459682-02	.59999999-02	.33949600 00	.33949463 00	.34021251 00	-.71788206-03
DZ	.21117799-05	.28814103-02	.59999999-02	.35909621 00	.35909832 00	.36309415 00	-.39958246-02

```
*                                                    DIFFERENCES
                                                     ACQUISITION
      TIME= 0.HRS
   RA  -0.14012500E 03 VEL  0.68328857E-01 GAM  0.57840347E-03 PSI  0.12507629E 00 RAS  0.20938873E-01
 * DE   0.28868198E-01 ALT -0.14018750E 03 ROP  0.23631250E 03 SMA  0.41375000E 02 ECC -0.22854656E-04
 * IN  -0.11087537E 00 M M -0.68092346E-03 ASN  0.17051697E 00 AOP -0.96526146E-01 TAN  0.13887882E-04
 *  D   0.70538434E 04  DV  0.78647866E 01
 *
                                                     END OF TRACK
      TIME= 0.12666667E 01 HRS
   RA   0.20550000E 03 VEL  0.14141846E 00 GAM -0.27012825E-03 PSI -0.40287971E-01 RAS  0.41380882E-01
 * DE  -0.11712265E 00 ALT  0.20543218E 03 ROP  0.24700000E 03 SMA  0.15591250E 04 ECC  0.92428178E-04
 * IN  -0.11088705E 00 M M -0.25538445E-01 ASN  0.16938400E 00 AOP -0.12618160E 00 TAN  0.11625141E-03
 *  D   0.14151342E 05  DV  0.80320868E 01
```

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(f) Case 29: 76-minute arc of 2-way tracking

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.27601001 06	-.27736969 06	-.86228109 03	.81350738 09	-.55418463 09	-.26590507 08
Y	-.27736969 06	.30796456 06	.16700301 05	-.80576975 09	.64441491 09	.96894486 08
Z	-.86228109 03	.16700301 05	.99001385 04	.10622314 08	.38561838 08	.33615905 08
DX	.81350738 09	-.80576975 09	.10622314 08	.25092996 13	-.17136989 13	-.10080971 12
DY	-.55418463 09	.64441491 09	.38561838 08	-.17136989 13	.15404302 13	.34152305 12
DZ	-.26590507 08	.96894486 08	.33615905 08	-.10080971 12	.34152305 12	.20884394 12

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.95136293 00	.16495512-01	-.97751365 00	.84990631 00	.11075243 00
Y	.95136293 00	-.10000000 01	-.30244979 00	.91660947 00	-.93560858 00	-.38206544 00
Z	.16495512-01	-.30244979 00	-.10000000 01	-.67394155-01	-.31225979 00	-.73928728 00
DX	-.97751365 00	.91660947 00	-.67394155-01	-.10000000 01	.87164021 00	.13925640 00
DY	.84990631 00	-.93560858 00	-.31225979 00	.87164021 00	-.10000000 01	-.60212696 00
DZ	.11075243 00	-.38206544 00	-.73928728 00	.13925640 00	-.60212696 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.34635858 01	-.39164146 00	.48651628 01	.86098838-03	.34345958-02	-.53614123-02
Y	-.39164146 00	.45850287-01	-.55352348 00	-.97856358-04	-.39000531-03	.60848145-03
Z	.48651628 01	-.55352348 00	.68413425 01	.12104441-02	.48279026-02	-.75357366-02
DX	.86098838-03	-.97856358-04	.12104441-02	.21424089-06	.85438498-06	-.13335743-05
DY	.34345958-02	-.39000531-03	.48279026-02	.85438498-06	.34076726-05	-.53190229-05
DZ	-.53614123-02	.60848145-03	-.75357366-02	-.13335743-05	-.53190229-05	.83025257-05

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Continued

(f) Case 29: 76-minute arc of 2-way tracking

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.34635858 01	-.39164146 00	.48651628 01	.86058838-03	.34345568-02	-.53614123-02
Y	-.39164146 00	.45880287-01	-.55352348 00	-.97856358-04	-.39000531-03	.60848145-03
Z	.48651628 01	-.55352348 00	.68413425 01	.12104441-02	.48279026-02	-.75357366-02
DX	.86058838-03	-.97856358-04	.12104441-02	.21424089-06	.85438498-06	-.13335743-05
DY	.34345568-02	-.39000531-03	.48279026-02	.85438498-06	.34076726-05	-.53190229-05
DZ	-.53614123-02	.60848145-03	-.75357366-02	-.13335743-05	-.53190229-05	.83025257-05

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	-.98234785 00	.99945612 00	.99950076 00	.99973261 00	-.99979536 00
Y	-.98234785 00	.10000000 01	-.98788182 00	-.98690984 00	-.98623680 00	.98578419 00
Z	.99945612 00	-.98788182 00	.99999999 00	.99982245 00	.99990536 00	-.99988471 00
DX	.99950076 00	-.98690984 00	.99982245 00	.10000000 01	.99993896 00	-.99991006 00
DY	.99973261 00	-.98623680 00	.99990536 00	.99993896 00	.99999999 00	-.99999499 00
DZ	-.99979536 00	.98578419 00	-.99988471 00	-.99991006 00	-.99999499 00	.10000000 01

TABLE XV.- NOMINAL LM CASES WITH P = (4KM; 6M/SEC) AND ΔS = (0.6KM; 2M/SEC) - Concluded

(f) Case 29: 76-minute arc of 2-way tracking

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY 2045530.0

TIME H M S	TC	Q	CC3				
221932	60	12	.34041384	C4	.101	CC	.0616
222032	60	12	.37659904	C4	.101	00	.0430
222132	60	12	.41374136	C4	.101	00	.0447
222232	60	12	.45082147	C4	.101	00	.0269
222332	60	12	.48817997	C4	.101	CC	.0253
222432	60	12	.52581734	C4	.101	CC	.0099
222532	60	12	.56372398	C4	.101	CC	.0101
222632	60	12	.60193009	C4	.101	CC	-.0010
222732	60	12	.64040578	C4	.101	CC	-.0079
222832	60	12	.67916093	C4	.101	00	-.0176
222932	60	12	.71819521	C4	.101	00	-.0272
223032	60	12	.75750814	C4	.101	CC	-.0231
223132	60	12	.79709885	C4	.101	CC	-.0303
223232	60	12	.83696628	C4	.101	CC	-.0295
223332	60	12	.87710889	C4	.101	CC	-.0389
223432	60	12	.91752493	C4	.101	CC	-.0326
223532	60	12	.95821214	C4	.101	CC	-.0381
223632	60	12	.99916775	C4	.101	00	-.0446
223732	60	12	.10403866	C5	.101	CC	-.0364
223832	60	12	.10818710	C5	.101	CC	-.0345
223932	60	12	.11236102	C5	.101	00	-.0441
224032	60	12	.11656013	C5	.101	00	-.0297
224132	60	12	.12078384	C5	.102	CC	-.0258
224232	60	12	.12503148	C5	.102	CC	-.0226
224332	60	12	.12930226	C5	.102	CC	-.0179
224432	60	12	.13359535	C5	.102	CC	-.0099
224532	60	12	.13790575	C5	.102	00	-.0001
224632	60	12	.14224436	C5	.102	CC	.0137
224732	60	12	.14659795	C5	.102	00	.0128
224832	60	12	.15096917	C5	.102	CC	.0249
224932	60	12	.15535644	C5	.102	CC	.0388
225032	60	12	.15975808	C5	.102	00	.0498
225132	60	12	.16417219	C5	.102	CC	.0557
225232	60	12	.16859666	C5	.102	00	.0674

FREQUENCY 2045750.0

H M S							
230432	60	12	.22135991	C5	.102	CC	.0923
230532	60	12	.22559320	C5	.102	CC	.0801
230632	60	12	.22977240	C5	.102	00	.0603
230732	60	12	.23388916	C5	.102	00	.0505
230832	60	12	.23793440	C5	.102	CC	.0354
230932	60	12	.24189830	C5	.102	CC	.0203
231032	60	12	.24577023	C5	.102	00	.0020
231132	60	12	.24953871	C5	.102	CC	-.0132
231232	60	12	.25319139	C5	.102	CC	-.0222
231332	60	12	.25671497	C5	.102	CC	-.0386
231432	60	12	.26009518	C5	.102	CC	-.0435
231532	60	12	.26331679	C5	.102	00	-.0544
231632	60	12	.26636352	C5	.102	CC	-.0518
231732	60	12	.26921803	C5	.102	CC	-.0452
231832	60	12	.27186200	C5	.102	CC	-.0581
231932	60	12	.27427601	C5	.102	CC	-.0681
232032	60	12	.27643971	C5	.102	CC	-.0547
232132	60	12	.27833176	C5	.103	00	-.0518
232232	60	12	.27992995	C5	.103	CC	-.0449
232332	60	12	.28121128	C5	.103	00	-.0278
232532	60	12	.28272844	C5	.103	CC	.0142
232632	60	12	.28291581	C5	.103	CC	.0352
232732	60	12	.28268990	C5	.103	00	.0603
232832	60	12	.28202657	C5	.103	CC	.0596
232932	60	12	.28090233	C5	.103	CC	.0750
233032	60	12	.27929469	C5	.103	00	.0728
233132	60	12	.27718254	C5	.103	CC	.0710
233232	60	12	.27454659	C5	.103	CC	.0496
233332	60	12	.27136990	C5	.103	00	.0186
233432	60	12	.26763834	C5	.103	00	-.0505
233532	60	12	.26334109	C5	.103	00	-.1431

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-221932	8/14-233532	65	.463-01	.463-01	.291-04	.215-02

TABLE XVI.- NON-NOMINAL LM CASE WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC)

Case 30: 9-minute arc of 2- and 3-way tracking (Tight covariance matrix)

```
ITERATION NUMBER    4      EPOCH  66/08/14  221922.013    CLOCK  L25140    SCS  .30675 00    GSOS  .10748 02

  X   21340335535116C737362452      Y   61461676C556561611611111      Z   6127664C341055753554200C
 DX   2CC70551527114501252710 6     DY   17753253441414446414577 4     DZ   17756405417214436457027C
CCCCCC 23442525422200000000000

C          CC          STDEVDQ        APRIORI          OLD Q          NEW Q          NOMINAL Q        DQ(NOM)
                                      STDEVDQ

 X    .85220245-03   .33712255 01   .90000000 01    .10378543 04    .10378551 04    .10545716 04   -.16716476 02
 Y    .27586693-03   .19021984 01   .90000000 01   -.31917614 04   -.31917612 04   -.31754982 04   -.16262970 02
 Z   -.40168622-04   .64158151 01   .90000000 01   -.10050137 04   -.10050137 04   -.99400009 03   -.11013634 02
DX   -.75762652-06   .58259752-02   .12000000-01    .88622116 00    .88622040 00    .89572713 00   -.95067247-02
DY    .32918121-07   .51077466-03   .12000000-01    .33855535 00    .33855538 00    .35021251 00   -.11657126-01
DZ   -.95355771-06   .55253206-02   .12000000-01    .36336558 00    .36336563 00    .37309415 00   -.97285210-02

*                                                    DIFFERENCES
                                                     ACQUISITION
     TIME= 0.HRS
  RA  -0.16546250E 04 VEL  0.10173157E 02 GAM  0.38493872E-02 PSI -0.78579224E-01 RAS -0.34542084E-01
* DE   0.65585375E-01 ALT -0.16546875E 04 ROP  0.55826375E 05 SMA  0.30267625E 05 ECC -0.38113222E-02
* IN   0.16465425E-01 M M -0.49433041E 00 ASN -0.26370239E 00 ARP -0.48217773E-01 TAN  0.78422837E-02
*  D   0.14830432E 05  DV  0.11122659E 02
*                                                     END OF TRACK
     TIME= 0.3666556E 00 HRS
  RA  -0.13972500E 04 VEL  0.96806030E 01 GAM  0.70447922E-01 PSI -0.71304321E-01 RAS -0.11302948E-01
* DE   0.89587092E-01 ALT -0.13972500E 04 ROP  0.55768437E 05 SMA  0.30238625E 05 ECC -0.38071722E-02
* IN   0.16514540E-01 M M -0.49382305E 00 ASN -0.26380539E 00 ARP -0.11055756E 00 TAN  0.86023435E-02
*  D   0.17596058E 05  DV  0.13619735E 02
*
```

TABLE XVI.- NON-NOMINAL LM CASE WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

Case 30: 9-minute arc of 2- and 3-way tracking (Tight covariance matrix)

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.19416219 03	-.66047956 03	-.12934043 03	.37127883 07	-.58651657 07	-.31609188 07
Y	-.66047956 03	.22671744 04	.44577846 03	-.13303549 08	.20996691 08	.11331015 08
Z	-.12934043 03	.44577846 03	.87842779 02	-.26751139 07	.42207177 07	.22788689 07
DX	.37127883 07	-.13303549 08	-.26751139 07	.10738227 12	-.16880956 12	-.91612565 11
DY	-.58651657 07	.20996691 08	.42207177 07	-.16880956 12	.26543921 12	.14401131 12
DZ	-.31609188 07	.11331015 08	.22788689 07	-.91612565 11	.14401131 12	.78159990 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99548471 00	.99037337 00	-.81311423 00	.81698749 00	.81140700 00
Y	.99548471 00	-.10000000 01	-.39890363 00	.85262638 00	-.85590558 00	-.85120488 00
Z	.99037337 00	-.99890363 00	-.10000000 01	.87100961 00	-.87407908 00	-.86970918 00
DX	-.81311423 00	.85262638 00	.87100961 00	-.10000000 01	.99988072 00	.99999194 00
DY	.81698749 00	-.85590558 00	-.87407908 00	.99988072 00	-.10000000 01	-.99981999 00
DZ	.81140700 00	-.85120488 00	-.86970918 00	.99999194 00	-.99981999 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.11365162 02	.52635699 01	-.10365090 02	-.15873207-01	-.12278451-02	-.16344145-01
Y	.52635699 01	.36183589 01	-.10909956 02	-.44799086-02	-.29337323-03	-.47040239-02
Z	-.10365090 02	-.10909956 02	.41162684 02	.13879073-04	-.27796582-03	.49072449-03
DX	-.15873207-01	-.44799086-02	.13879073-04	.33941988-04	.28756719-05	.34492579-04
DY	-.12278451-02	-.29337323-03	-.27796582-03	.28756719-05	.26089075-06	.28909037-05
DZ	-.16344145-01	-.47040239-02	.49072449-03	.34492579-04	.28909037-05	.35109425-04

TABLE XVI.- NON-NOMINAL LM CASE WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

Case 30: 9-minute arc of 2- and 3-way tracking (Tight covariance matrix)

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.11365162 02	.52635699 01	-.10365090 02	-.15873207-01	-.12278451-02	-.16344145-01
Y	.52635699 01	.36183589 01	-.10909956 02	-.44799086-02	-.29337323-03	-.47040239-02
Z	-.10365090 02	-.10909956 02	.41162664 02	.13879073-04	-.27796582-03	.49072449-03
DX	-.15873207-01	-.44799086-02	.13879073-04	.33941988-04	.28756719-05	.34492579-04
DY	-.12278451-02	-.29337323-03	-.27796582-03	.28756719-05	.26089075-06	.26909037-05
DZ	-.16344145-01	-.47040239-02	.49072449-03	.34492579-04	.28909037-05	.35109425-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.99999999 00	.82079890 00	-.47921834 00	-.80818025 00	-.71306054 00	-.81820574 00
Y	.82079890 00	.10000000 01	-.89395429 00	-.40424504 00	-.30195020 00	-.41735136 00
Z	-.47921834 00	-.89395429 00	.10000000 01	.37131284-03	-.84822330-01	.12908448-01
DX	-.80818025 00	-.40424504 00	.37131284-03	.99999999 00	.99636536 00	.99918329 00
DY	-.71306054 00	-.30195020 00	-.84822330-01	.99636536 00	.99999999 00	.95519584 00
DZ	-.81820574 00	-.41735136 00	.12908448-01	.99918329 00	.95519584 00	.99999999 00

TABLE XVI.- NON-NOMINAL LM CASE WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Continued

Case 30: 9-minute arc of 2- and 3-way tracking (Tight covariance matrix)

STATION NUMBER 41 66/08/14 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045530.0

TIME H M S	TC Q	CC3	C3		
221932	60 12		-.88423840 03	.106 00	-.0037
222032	60 12		-.51848774 03	.106 00	.0123
222132	60 12		-.14884518 03	.106 00	-.0136
222232	60 12		.22169495 03	.106 00	-.0037
222332	60 12		.55613670 03	.106 00	-.0121
222432	60 12		.87348431 03	.105 00	.0069
222532	60 12		.13537388 04	.105 00	-.0142
222632	60 12		.17369014 04	.105 00	-.0102
222732	60 12		.21229715 04	.105 00	.0197
222832	60 12		.25119457 04	.105 00	.0289

DATA STATISTICS STATION 41 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
05/226	C3	8/14-221932	8/14-222832	10	.144-01	.145-01	.102-02	.209-03

TABLE XVI. - NON-NOMINAL LM CASE WITH P = (9KM; 12M/SEC) AND ΔS = (15KM; 12M/SEC) - Concluded

Case 30: 9-minute arc of 2- and 3-way tracking (Tight covariance matrix)

STATION NUMBER 12 66/08/14 ITERATION NUMBER 4 PASS NUMBER 04/226

FREQUENCY2045530.0

TIME H M S	TC	C		CC3
221932	60	12	.34041859 C4 .101 00	.0141
222032	60	12	.37654264 C4 .101 00	.0067
222132	60	12	.41374439 C4 .101 00	.0144
222232	60	12	.45082425 C4 .101 00	-.0009
222332	60	12	.48918268 C4 .101 00	-.0018
222432	60	12	.52581926 C4 .101 00	-.0163
222532	60	12	.56373625 C4 .101 00	-.0125
222632	60	12	.60193151 C4 .101 00	-.0151
222732	60	12	.64040568 C4 .101 00	-.0069
222832	60	12	.67915835 C4 .101 00	.0081

DATA STATISTICS STATION 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
04/226	CC3	8/14-221932	8/14-222832	10	.110-01	.110-01	-.102-02	.122-03

TABLE XVII.- NON-NOMINAL LM CASE WITH P = (100KM; 40M/SEC) AND ΔS = (15KM; 12M/SEC, 12M/SEC, 30M/SEC)

Case 31: 9-minute arc of 2- and 3-way tracking (Loose covariance matrix)

```
ITERATION NUMBER     4      EPOCH  66/05/14  221522.013     CLOCK  12514C     SCS  .94009-01     QSCS  .89933 00

  X   2134037231371620132 4535      Y   61461664711556167402526 5      Z   61277013716355704447256 0
 DX   2007042576431453514513 16     DY   17753235151614440230345      DZ   17756116306014430343653 3
CCOOOC 2344352542220000000000000

C          CC          STDEVCC        ABSFORT          OLD C          NEW Q          NOMINAL Q        DQ(NOM)
                                      STDEVDQ

 X   -.35107658-02   .53321540 01   .10000000 03    .10396537 04    .10399496 04    .10545716 04   -.14921829 02
 Y   -.17786176-02   .31157256 01   .10000000 03   -.31906059 04   -.31906117 04   -.31754982 04   -.15113525 02
 Z    .35830071-02   .99756663 01   .10000000 03   -.10083749 04   -.10083720 04   -.99400009 03   -.14371872 02
DX    .42360719-05   .87284178-02   .35555555-01    .88347893 00    .88348317 00    .85372712 00    .29756046-01
DY    .40733511-04   .73805287-03   .39999999-01    .33833588 00    .33833628 00    .35021251 00   -.11876225-01
DZ    .42354066-05   .99004666-02   .39999999-01    .36054113 00    .36056536 00    .37309415 00   -.12528784-01

*                                                    DIFFERENCES
                                                     ACQUISITION
      TIME= 0.HRS
   RA  -0.17812500E-03 VEL -0.11917678E-01 GAM -0.85675716E-03 PSI  0.25033951E-01 RAS  0.66757202E-03
* DE   0.10457516E-01 ALT -0.17825300E-03 ROP -0.69921250E-04 SMA -0.39557500E-04 ECC  0.46626851E-03
* IN  -0.25748419E-01 M M  0.44918931E-01 ASN  0.22976740E-01 ARP  0.13336182E-01 TAN -0.92083588E-03
*  D   0.21096909E-04  DV  0.19533213E-01
*                                                    END OF TRACK
      TIME= 0.16666666E-03 HRS
   RA  -0.23249999E-03 VEL -0.11149987E-01 GAM -0.91619492E-02 PSI  0.24772499E-01 RAS -0.13694763E-02
* DE   0.49349770E-02 ALT -0.23262500E-03 ROP -0.70435625E-04 SMA -0.39867500E-04 ECC  0.46977773E-03
* IN  -0.25113821E-01 M M  0.65413475E-01 ASN  0.22781372E-01 ARP  0.19784927E-01 TAN -0.10074377E-02
*  D   0.12224102E-04  DV  0.20613515E-01
*
```

TABLE XVII.- NON-NOMINAL LM CASE WITH P = (100KM; 40M/SEC) AND ΔS = (15KM; 12M/SEC, 12M/SEC, 30M/SEC) - Continued

Case 31: 9-minute arc of 2- and 3-way tracking (Loose covariance matrix)

J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.19491772 03	-.66134338 03	-.13074004 03	.37216154 07	-.58788876 07	-.31685586 07
Y	-.66134338 03	.22698935 04	.44931076 03	-.13294191 08	.20981299 08	.11323409 08
Z	-.13074004 03	.44931076 03	.89346579 02	-.26968548 07	.42549319 07	.22974495 07
DX	.37216154 07	-.13294191 08	-.26968548 07	.10738526 12	-.16881162 12	-.91616306 11
DY	-.58788876 07	.20981299 08	.42549319 07	-.16881162 12	.26543321 12	.14401497 12
DZ	-.31685586 07	.11323409 08	.22974495 07	-.91616306 11	.14401497 12	.78164171 11

CORRELATIONS BASED ON J MATRIX ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	-.10000000 01	.99557357 00	.99069311 00	-.81345496 00	.81731184 00	.81176855 00
Y	.99557357 00	-.10000000 01	-.99902167 00	.95263190 00	-.85589929 00	-.85122687 00
Z	.99069311 00	-.99902167 00	-.10000000 01	.87064556 00	-.87370950 00	-.86935725 00
DX	-.81345496 00	.95263190 00	.87064556 00	-.10000000 01	.99988090 00	.99999212 00
DY	.81731184 00	-.85589929 00	-.87370950 00	.99988090 00	-.10000000 01	-.99982058 00
DZ	.81176855 00	-.85122687 00	-.86935725 00	.99999212 00	-.99982058 00	-.10000000 01

J INVERSE ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.28431868 02	.14449189 02	-.32346812 02	-.39811910-01	-.30864258-02	-.40966846-01
Y	.14449189 02	.97337128 01	-.28671261 02	-.14199575-01	-.98690484-03	-.14806493-01
Z	-.32346812 02	-.28671261 02	.99513917 02	.14831961-01	.56335378-03	.16263891-01
DX	-.39811910-01	-.14199575-01	.14831961-01	.76185279-04	.63226207-05	.77654855-04
DY	-.30864258-02	-.98690484-03	.56335378-03	.63226207-05	.54472206-06	.64084139-05
DZ	-.40966846-01	-.14806493-01	.16263891-01	.77654855-04	.64084139-05	.79218305-04

TABLE XVII.- NON-NOMINAL LM CASE WITH P = (100KM; 40M/SEC) AND ΔS = (15KM; 12M/SEC, 12M/SEC, 30M/SEC) - Continued

Case 31: 9-minute arc of 2- and 3-way tracking (Loose covariance matrix)

COVARIANCE MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.28431868 02	.14449189 02	-.32346812 02	-.39811910-01	-.30864258-02	-.40966846-01
Y	.14449189 02	.97327128 01	-.28671261 02	-.14199575-01	-.98690484-03	-.14806493-01
Z	-.32346812 02	-.28671261 02	.99513917 02	.14831941-01	.56335378-03	.16263891-01
DX	-.39811910-01	-.14199575-01	.14831941-01	.76185279-04	.63226207-05	.77654855-04
DY	-.30864258-02	-.98690484-03	.56335378-03	.63226207-05	.54472206-06	.64084139-05
DZ	-.40966846-01	-.14806493-01	.16263891-01	.77654855-04	.64084139-05	.79218305-04

CORRELATION MATRIX OF ESTIMATED PARAMETERS ITERATION NUMBER 4

	X	Y	Z	DX	DY	DZ
X	.10000000 01	.86860798 00	-.60811663 00	-.85541093 00	-.78427011 00	-.86321118 00
Y	.86860798 00	.10000000 01	-.92127213 00	-.52146225 00	-.42861843 00	-.53323968 00
Z	-.60811663 00	-.92127213 00	.10000000 01	.17034176 00	.76515923-01	.18317650 00
DX	-.85541093 00	-.52146225 00	.17034176 00	.10000000 01	.98146342 00	.99958632 00
DY	-.78427011 00	-.42861843 00	.76515923-01	.98146342 00	.10000000 01	.97555173 00
DZ	-.86321118 00	-.53323968 00	.18317650 00	.99958632 00	.97555173 00	.99999999 00

TABLE XVII.- NON-NOMINAL LM CASE WITH P = (100KM; 40M/SEC) AND ΔS = (15KM; 12M/SEC, 12M/SEC, 30M/SEC) - Continued

Case 31: 9-minute arc of 2- and 3-way tracking (Loose covariance matrix)

STATION NUMBER 41 66/08/14 ITERATION NUMBER 4 PASS NUMBER 05/226

FREQUENCY2045530.0

TIME H M S	TC Q	CC3	C3	
221932	60 12	-.68424408 03	.106 00	.0020
222032	60 12	-.51848675 03	.106 00	.0113
222132	60 12	-.14984324 03	.106 00	-.0155
222232	60 12	.22169408 03	.106 00	-.0028
222332	60 12	.59613140 03	.106 00	-.0068
222432	60 12	.97347529 03	.105 00	.0159
222532	60 12	.13537293 04	.105 00	-.0047
222632	60 12	.17368970 04	.105 00	-.0058
222732	60 12	.21229804 04	.105 00	.0108
222832	60 12	.25119788 04	.105 00	-.0043

DATA STATISTICS STATION 41 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
05/226	C3	8/14-221932	8/14-222832	10	.934-02	.934-02	.107-04	.871-04

TABLE XVII.- NON-NOMINAL LM CASE WITH P = (100KM; 40M/SEC) AND ΔS = (15KM; 12M/SEC, 12M/SEC, 30M/SEC) - Concluded

Case 31: 9-minute arc of 2- and 3-way tracking (Loose covariance matrix)

STATICN NUMBER 12 66/C8/14 ITERATICN NLMBER 4 PASS NUMBER 04/226

FREQUENCY2C4553C.C

TIME H M S	TC	Q	CC3				
221932	6C	12	.34041565	C4	.1C1	CO	.C034
222032	6C	12	.37654395	C4	.101	CO	-.0066
222132	6C	12	.41374540	C4	.101	CO	.0043
222232	6C	12	.45C82458	C4	.1C1	CC	-.C042
222332	6C	12	.48818216	C4	.101	CO	.C034
222432	6C	12	.52581866	C4	.101	CO	-.C033
222532	6C	12	.56373446	C4	.101	CO	.C053
222632	6C	12	.6C152583	C4	.1C1	CO	.0016
222732	6C	12	.6404C490	C4	.101	CO	.0009
222832	6C	12	.67915558	C4	.101	CC	-.0042

DATA STATISTICS STATICN 12 ITERATION 4

PASS	DATA TYPE	BEGINNING TIME	END TIME	NLMBER CF POINTS	STD DEV	RMS	FIRST MOMENT	SECCND MOMENT
04/226	CC3	8/14-221932	8/14-222832	10	.402-02	.402-02	.763-04	.162-04

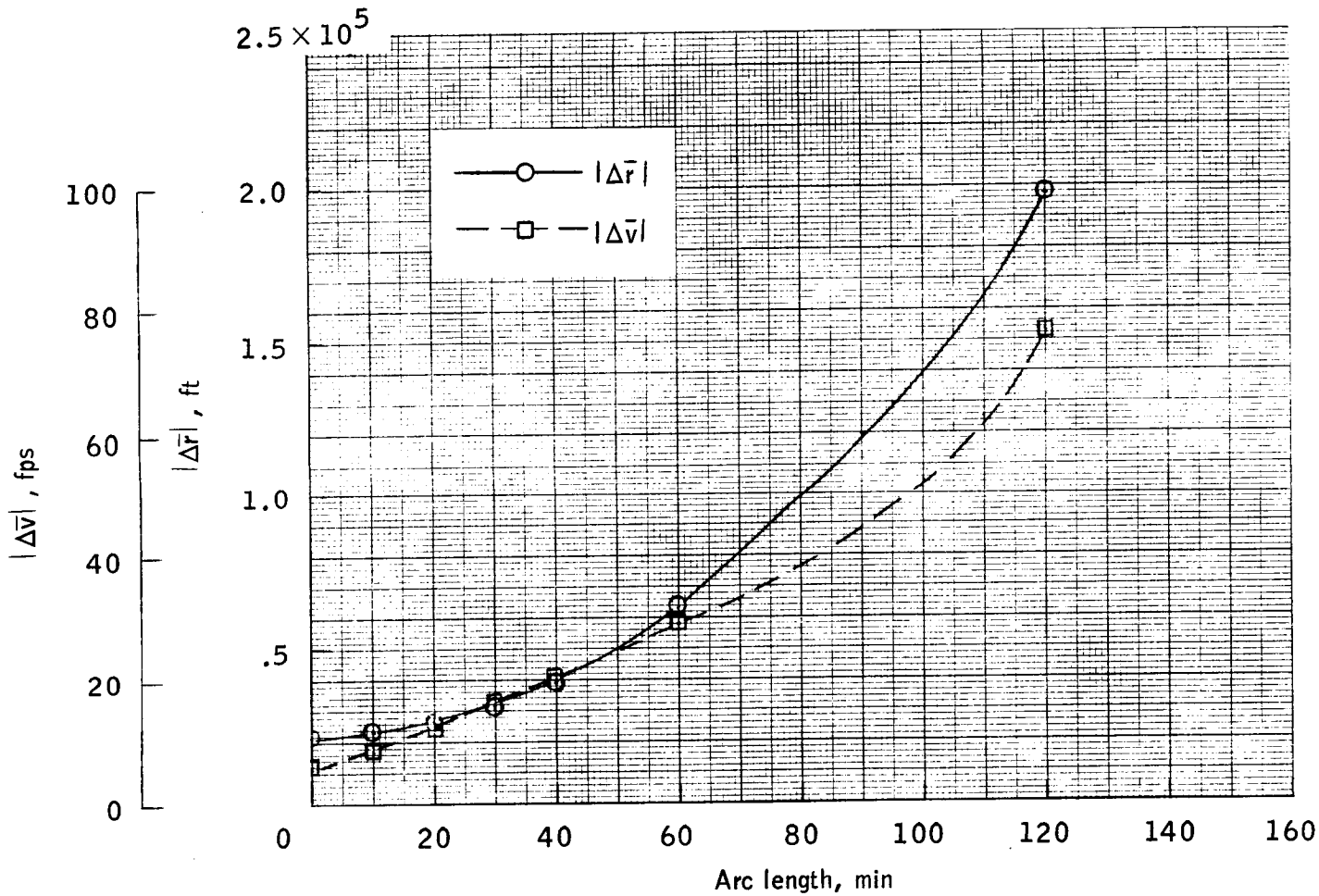


Figure 1.- Differences in position and velocity from the standard CM orbit (no tracking).

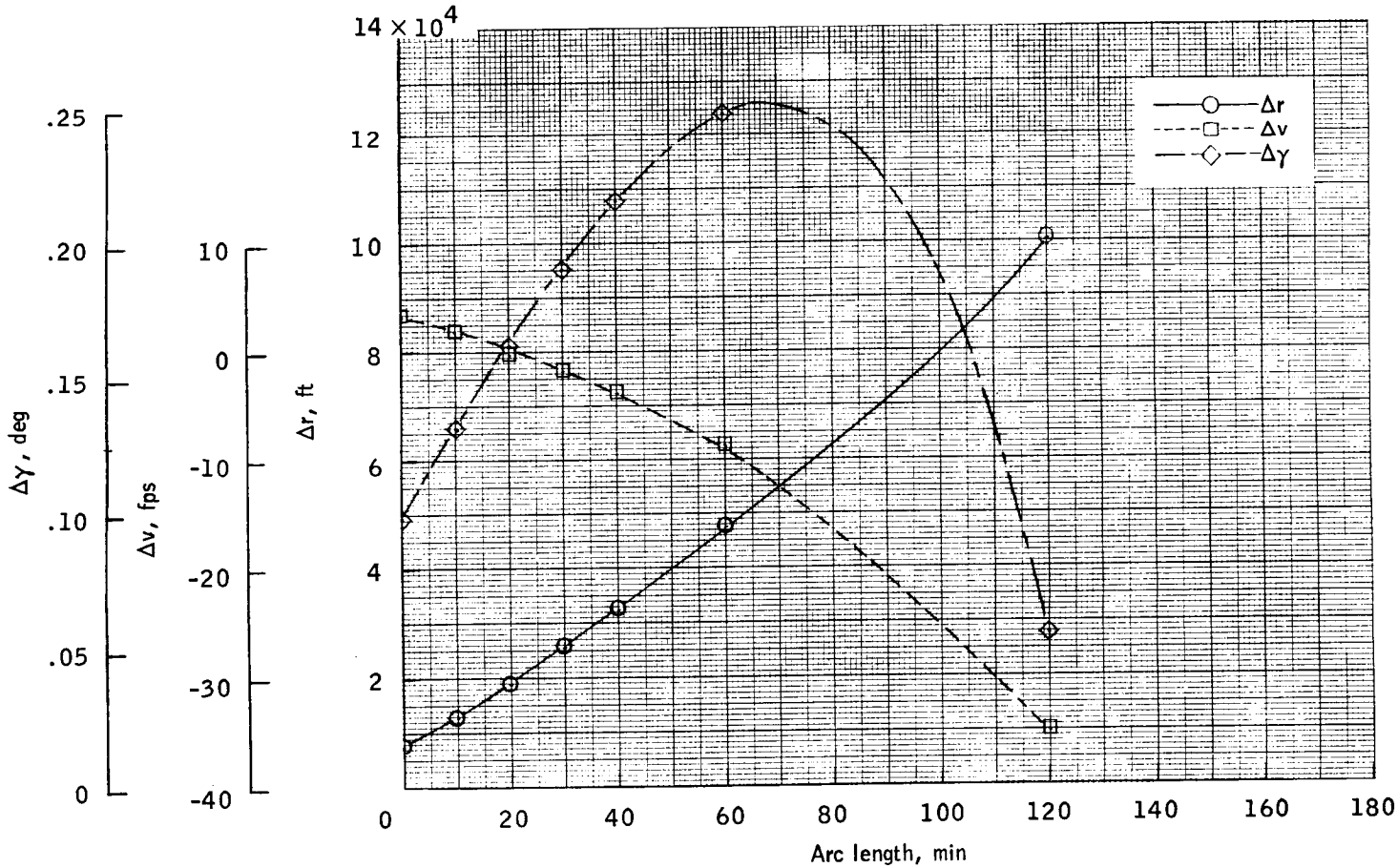


Figure 2.- Differences in radius, speed and flight-path angle from the standard CM orbit (no tracking).

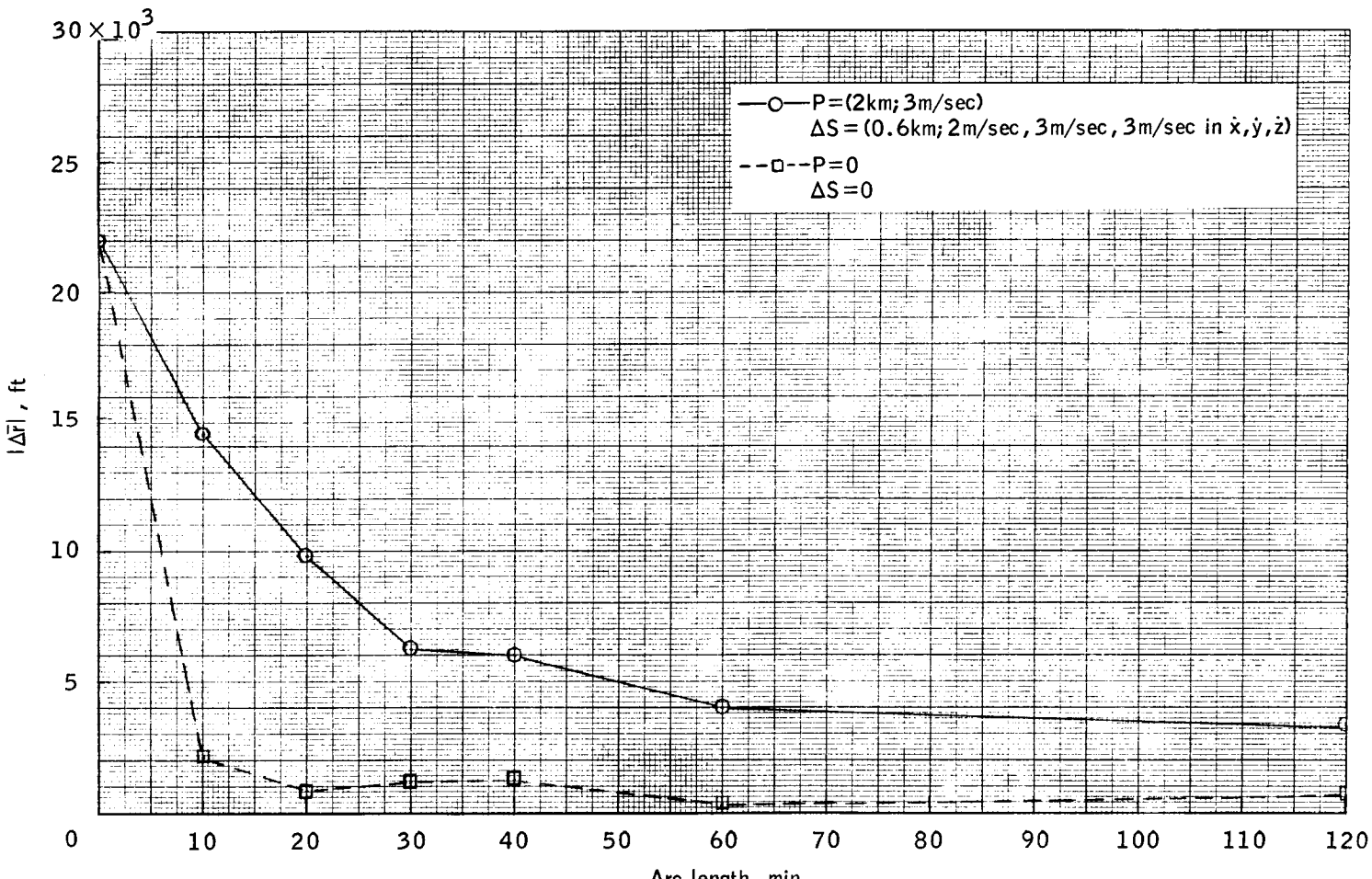


Figure 3.- Differences in position from the standard CM orbit at acquisition.

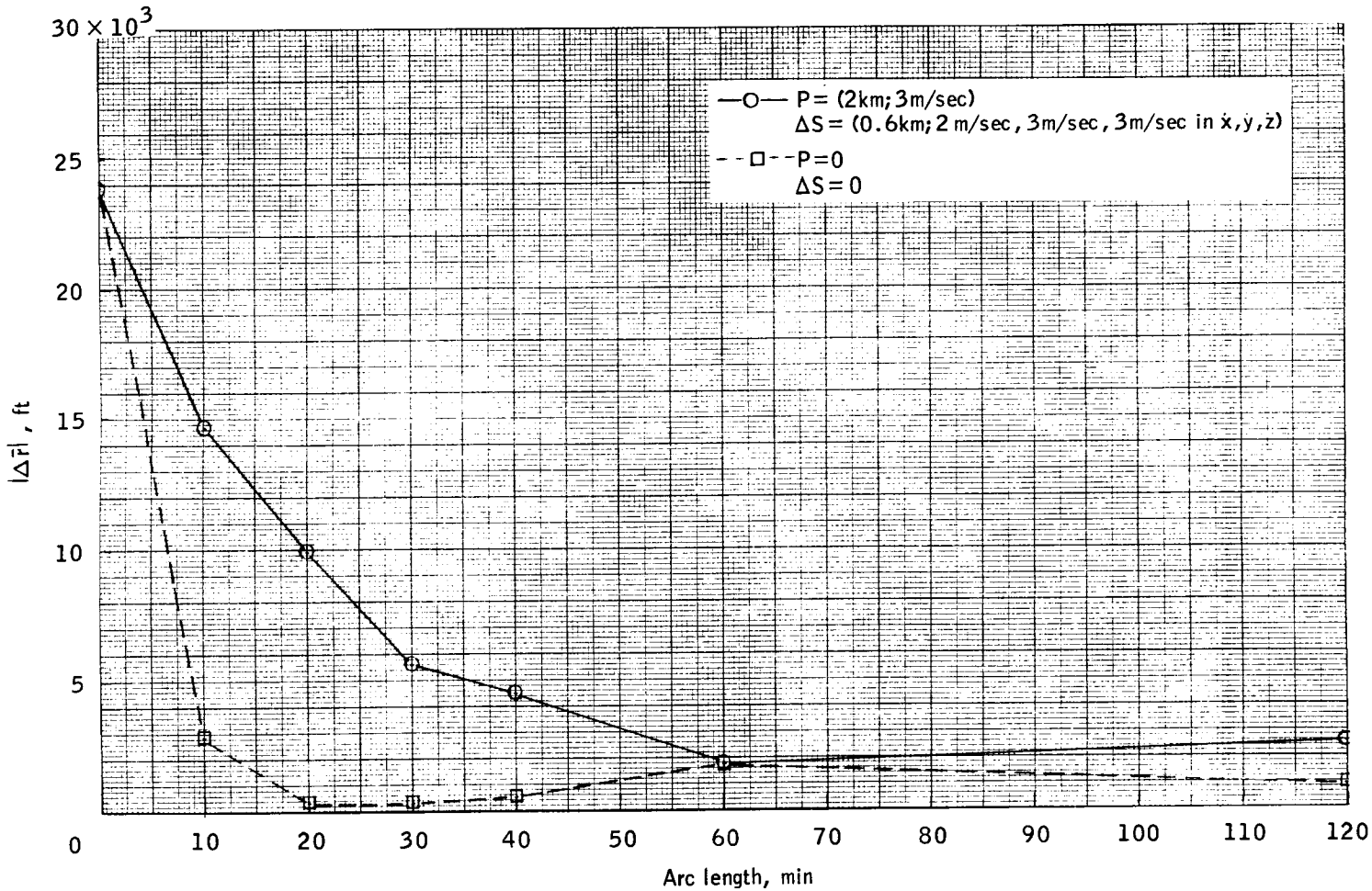


Figure 4.- Differences in position from the standard CM orbit at end of track.

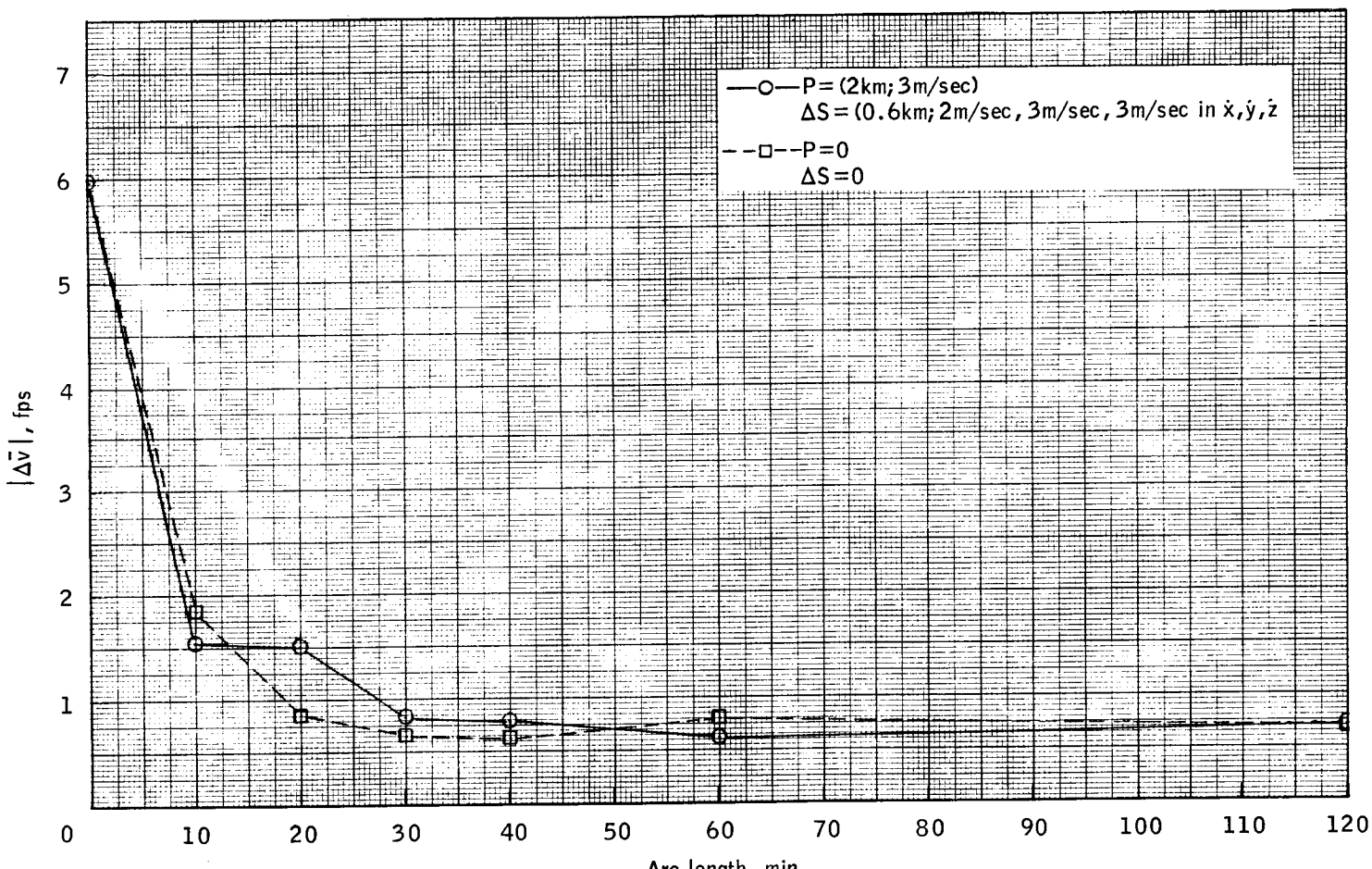


Figure 5.- Differences in velocity from the standard CM orbit at acquisition.

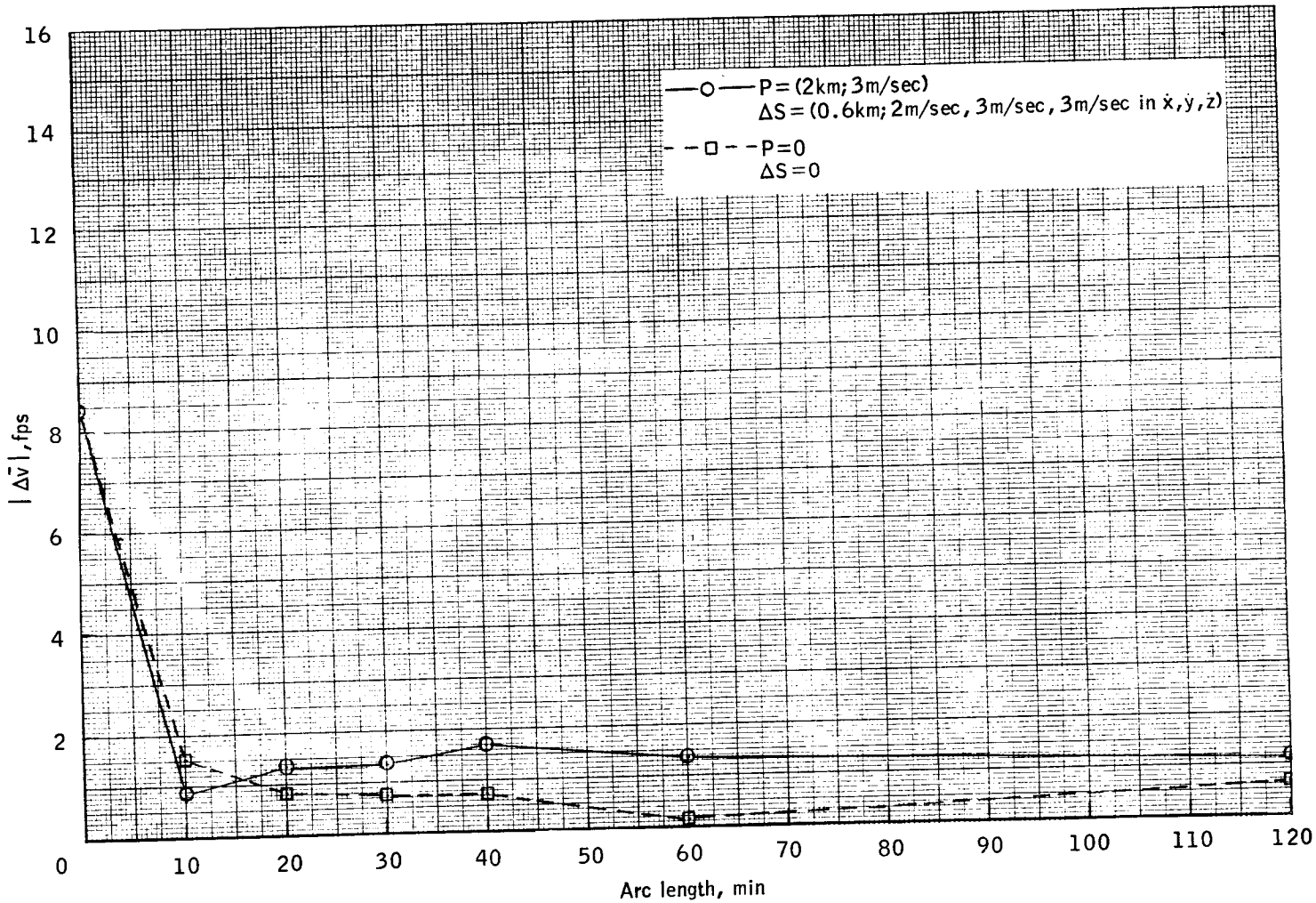


Figure 6.- Differences in velocity from the standard CM orbit at end of track.

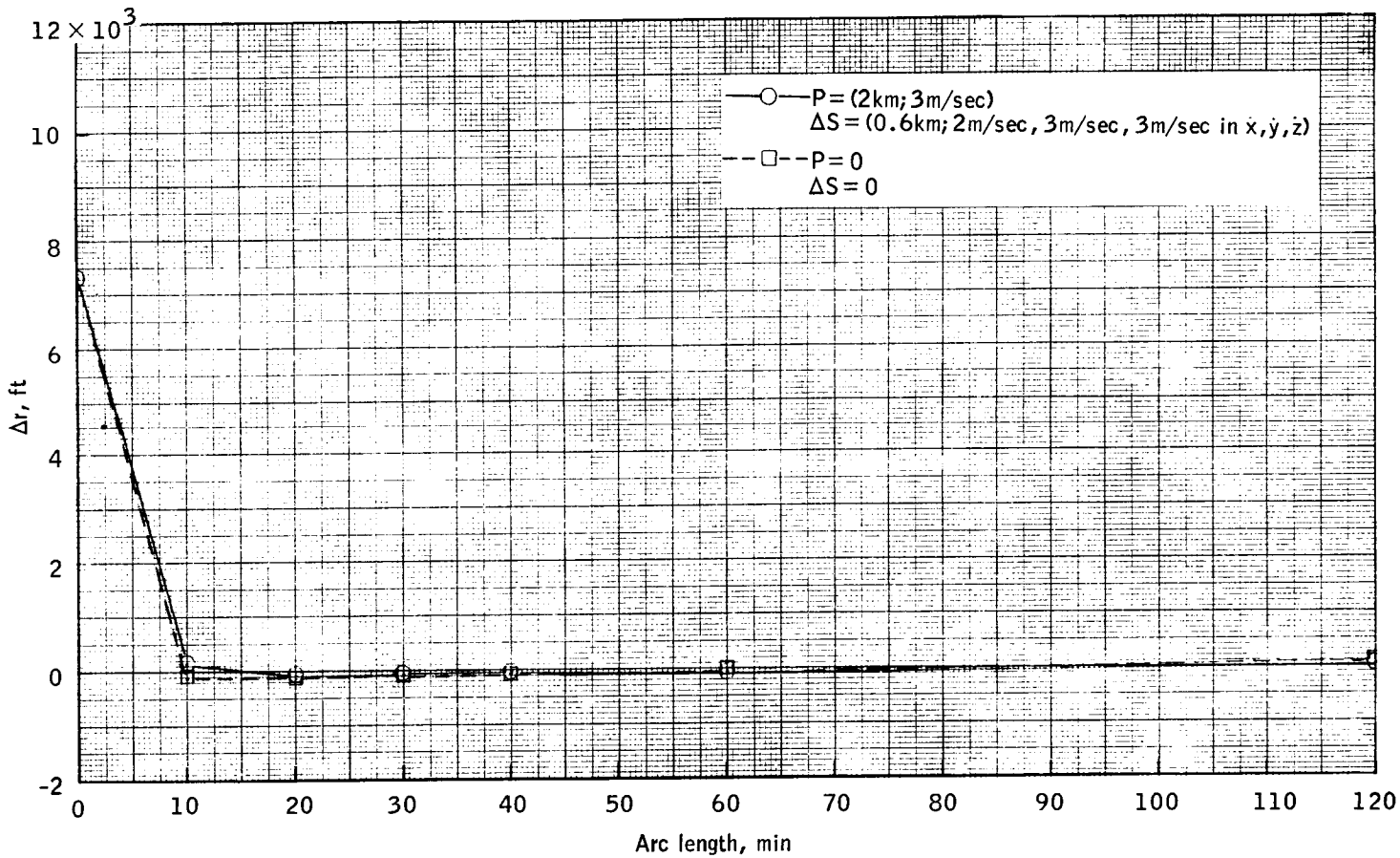


Figure 7.- Differences in radius from the standard CM orbit at acquisition.

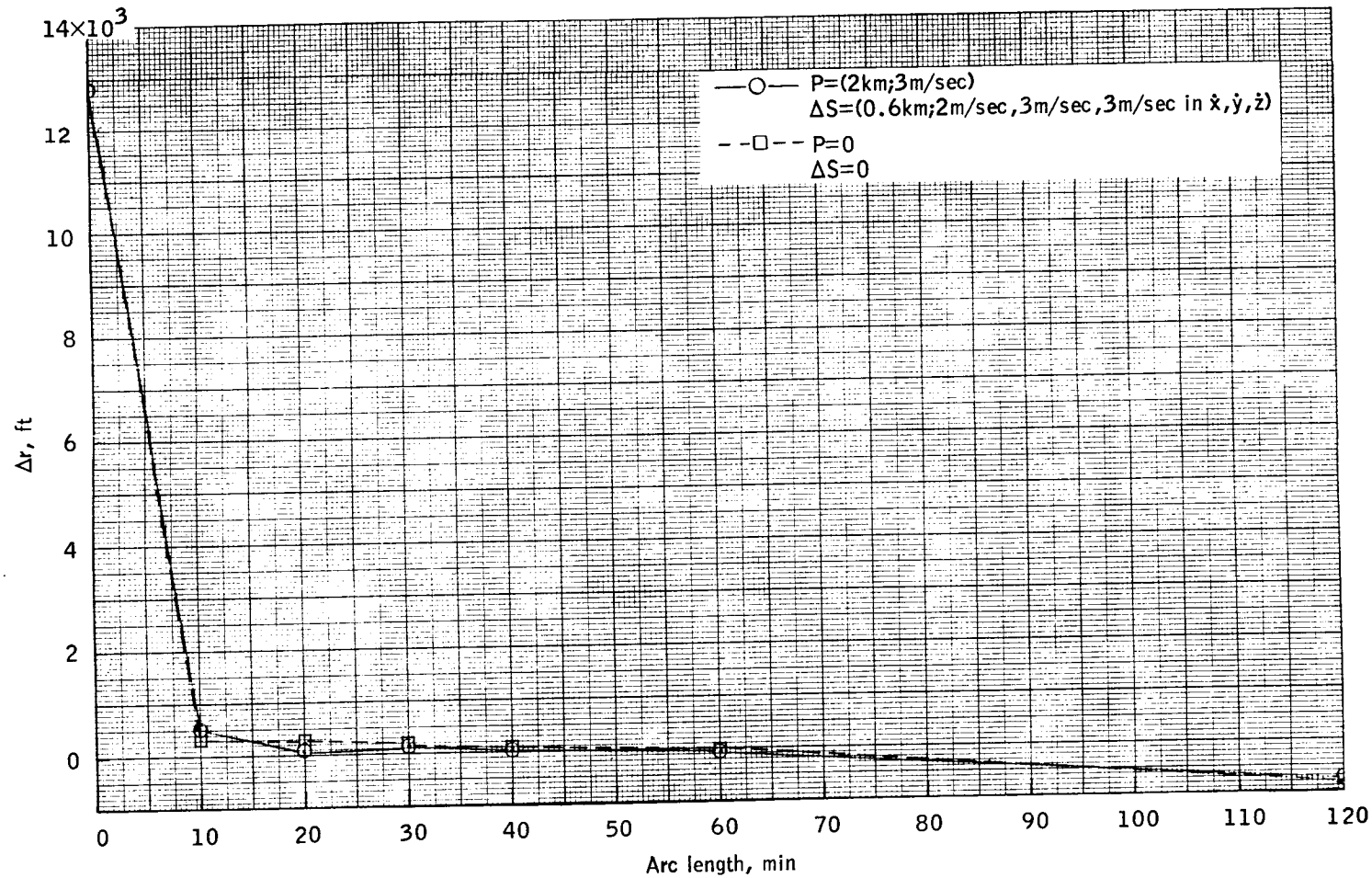


Figure 8.- Differences in radius from the standard CM orbit at end of track.

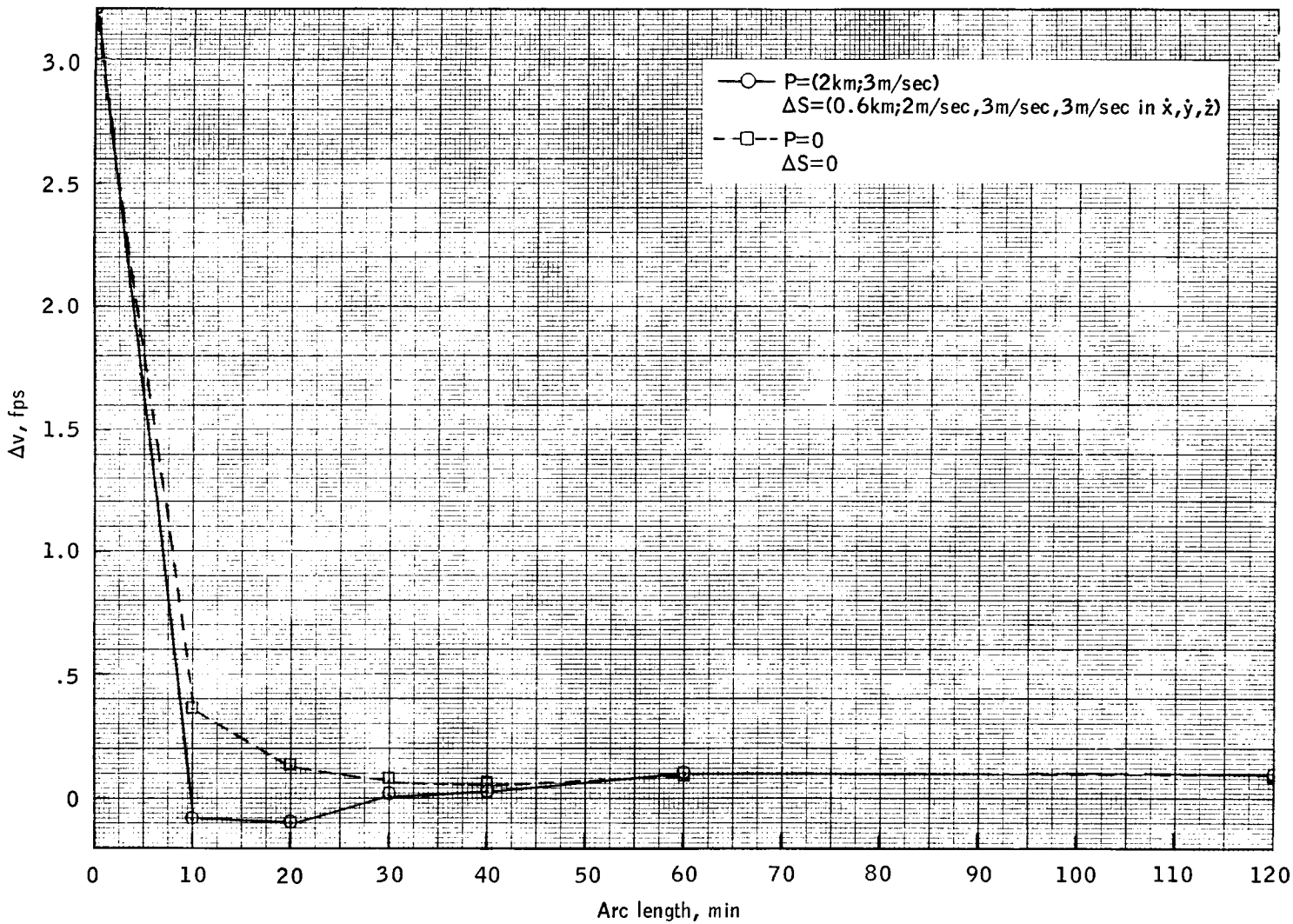


Figure 9.- Differences in speed from the standard CM orbit at acquisition.

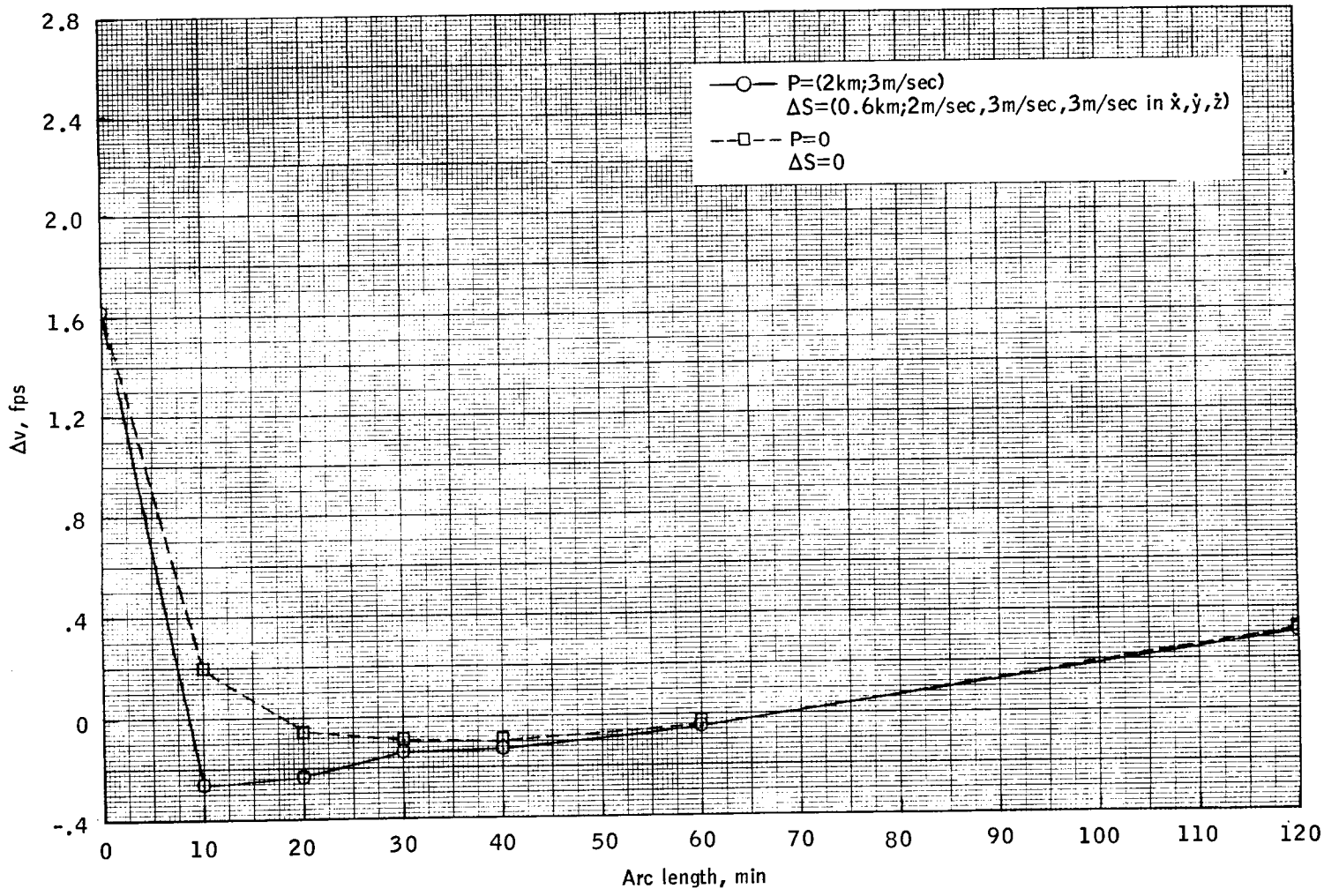


Figure 10.- Differences in speed from the standard CM orbit at end of track.

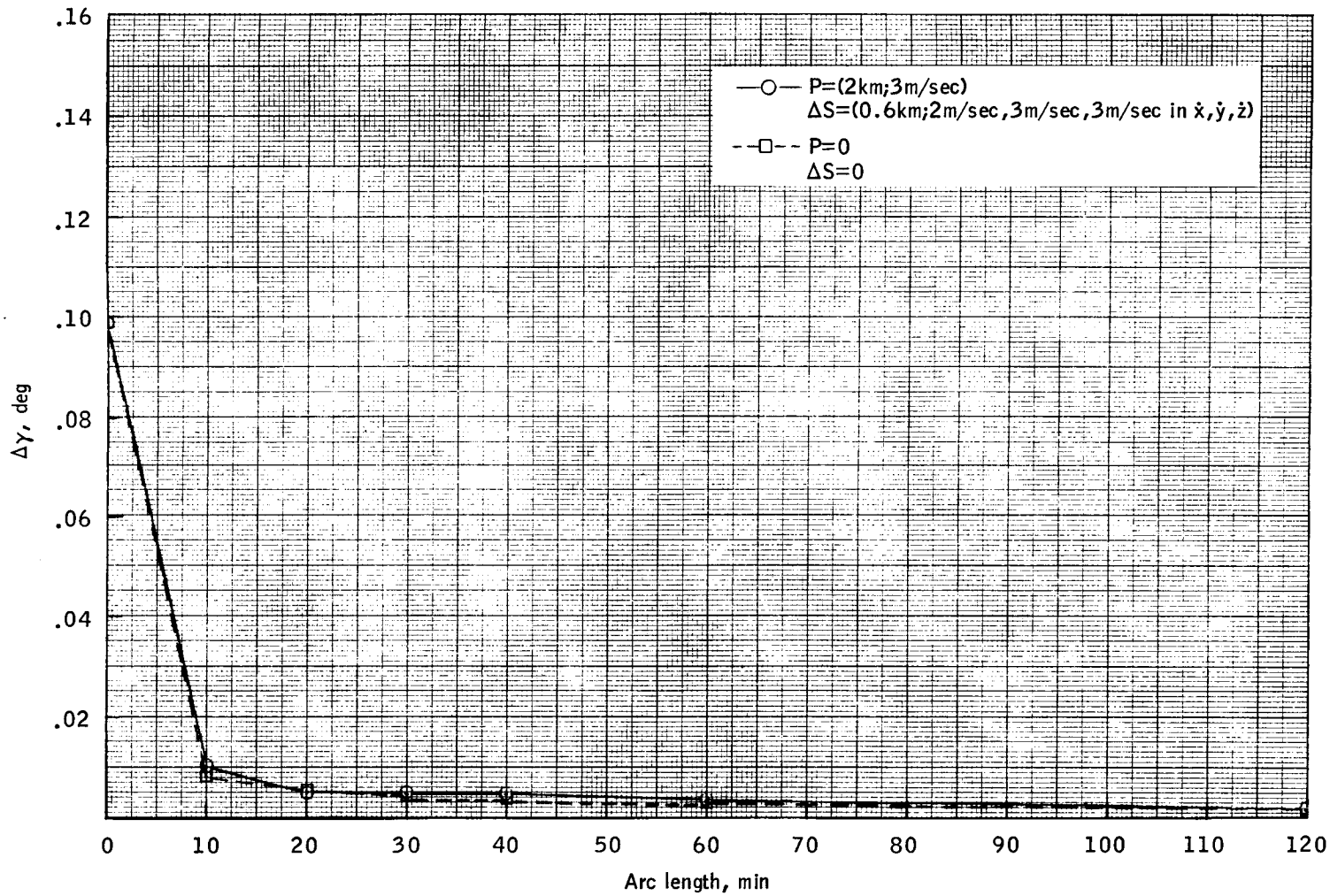


Figure 11.- Differences in flight-path angle from the standard CM orbit at acquisition.

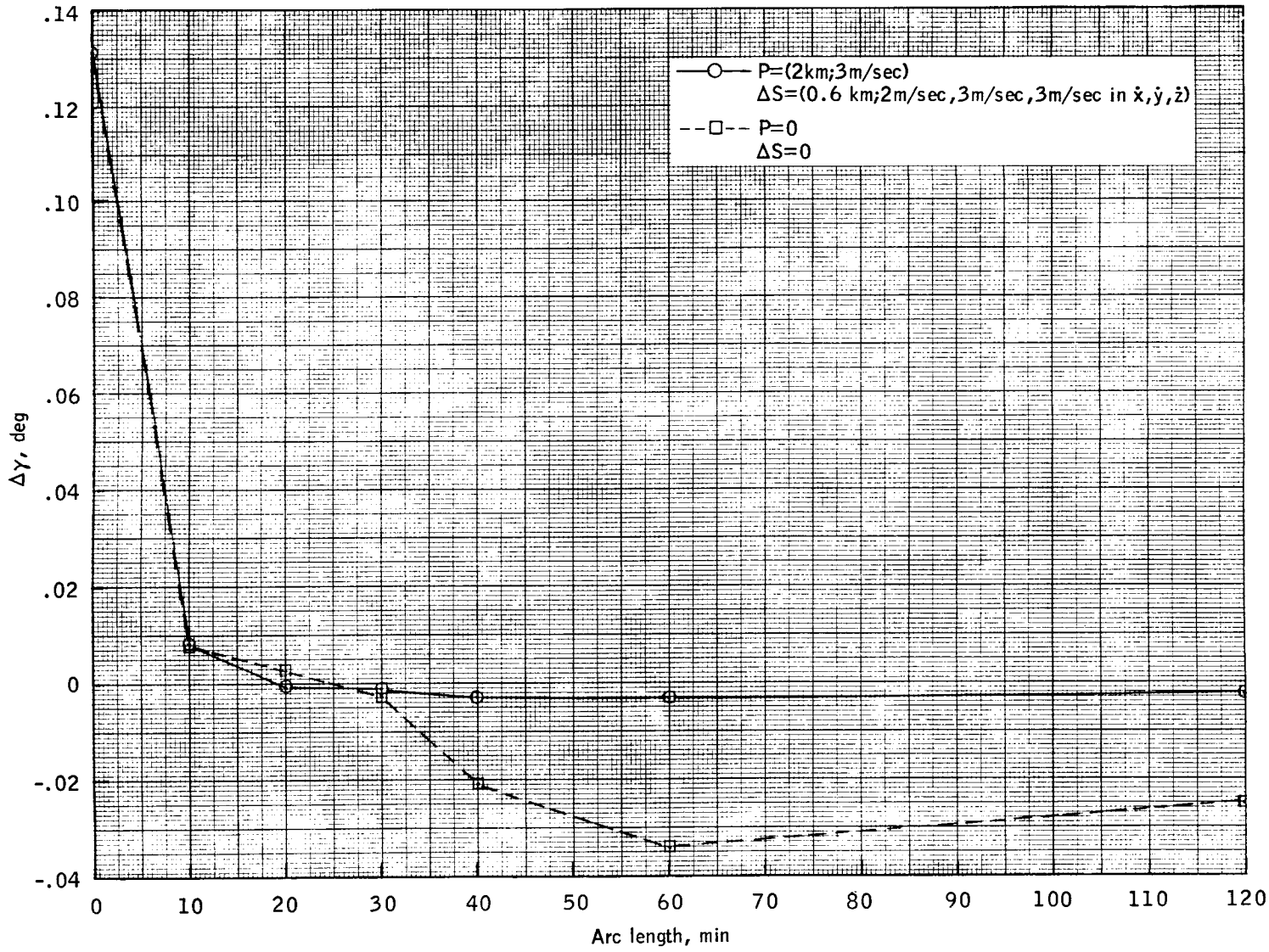


Figure 12.- Differences in flight-path angle from the standard CM orbit at end of track.

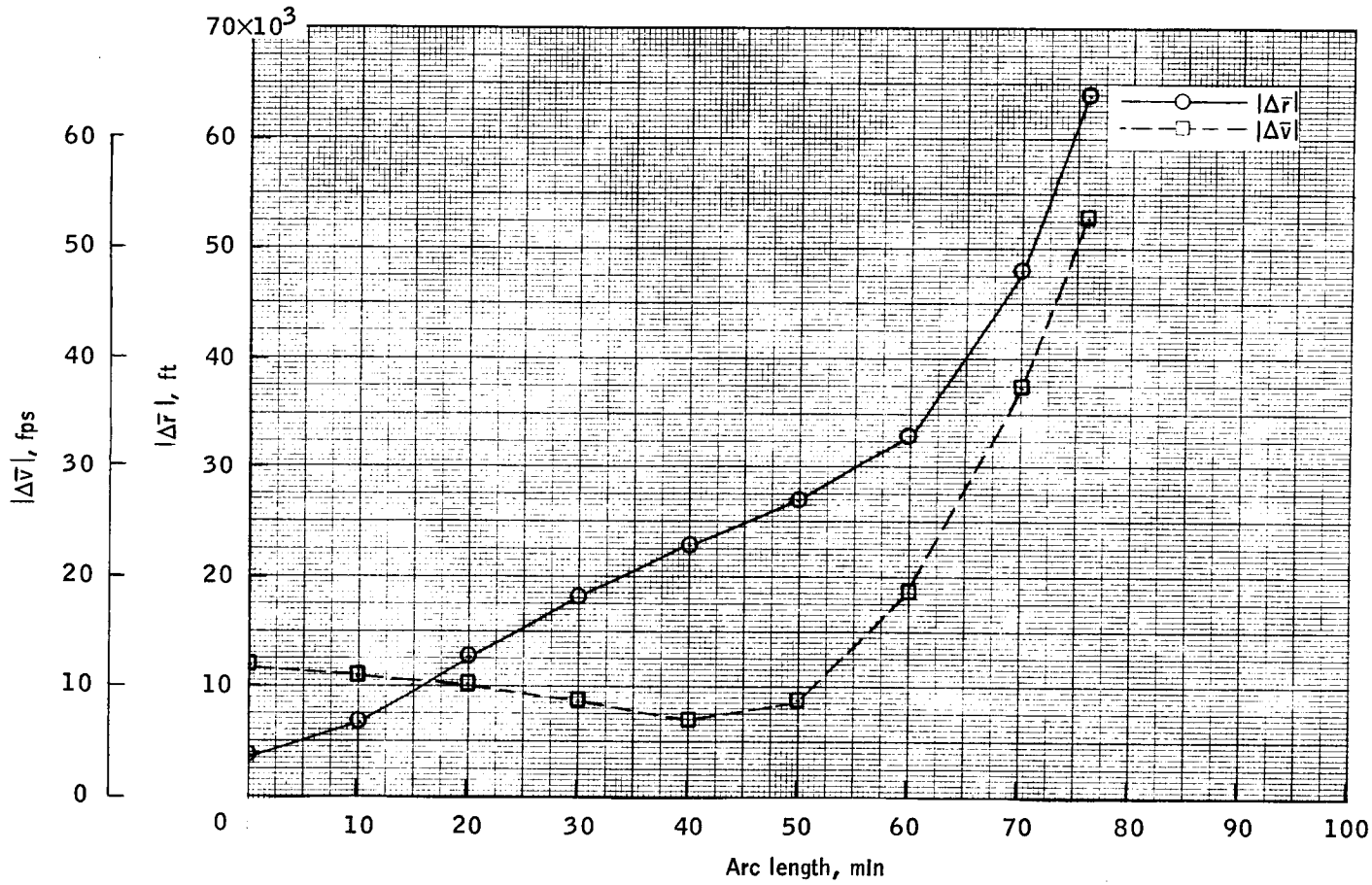


Figure. 13. Differences in position and velocity from the standard LM orbit (no tracking).

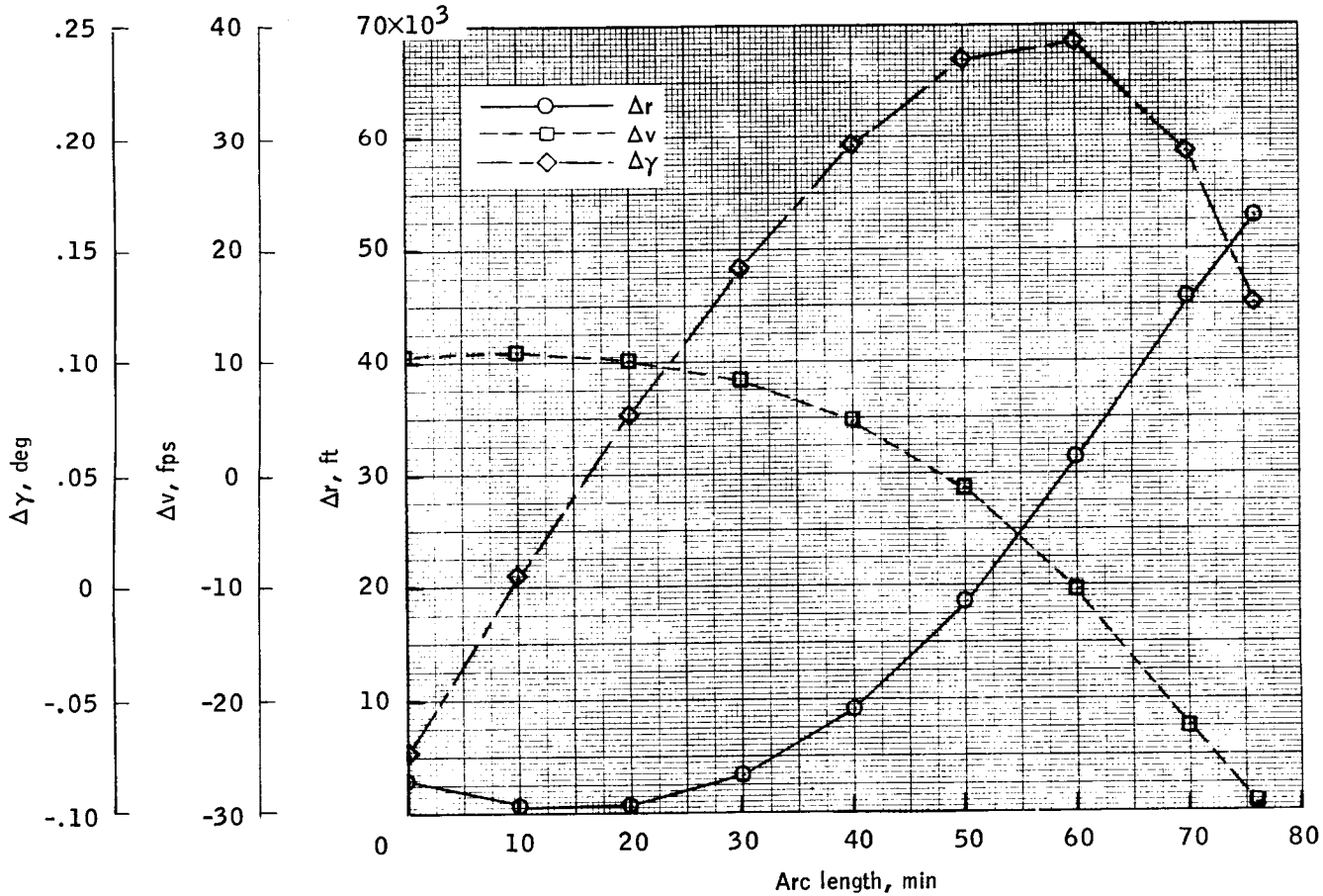


Figure. 14. Differences in radius, speed and flight-path angle from the standard LM orbit (no tracking).

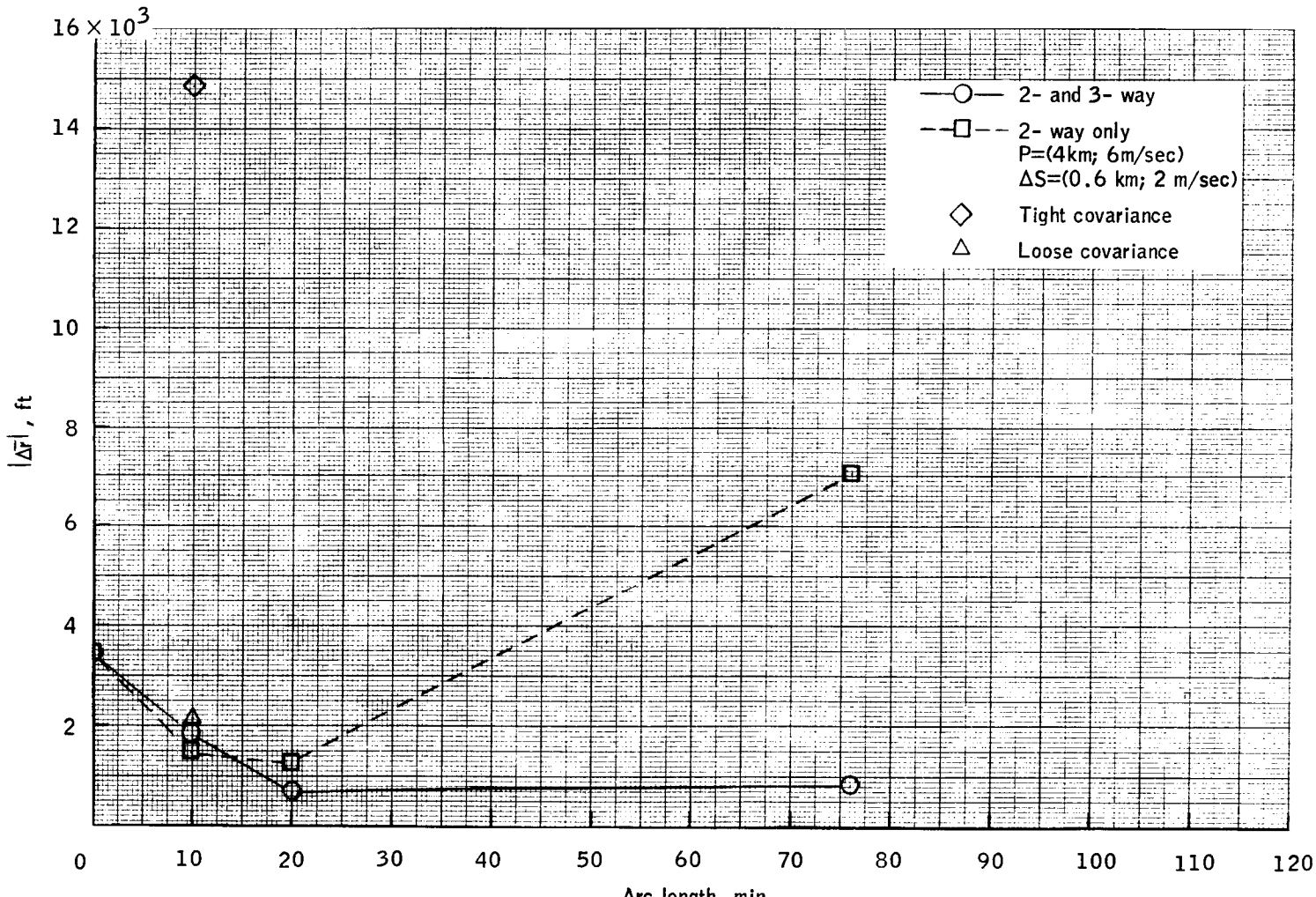


Figure 15.- Difference in position from the standard LM orbit at acquisition.

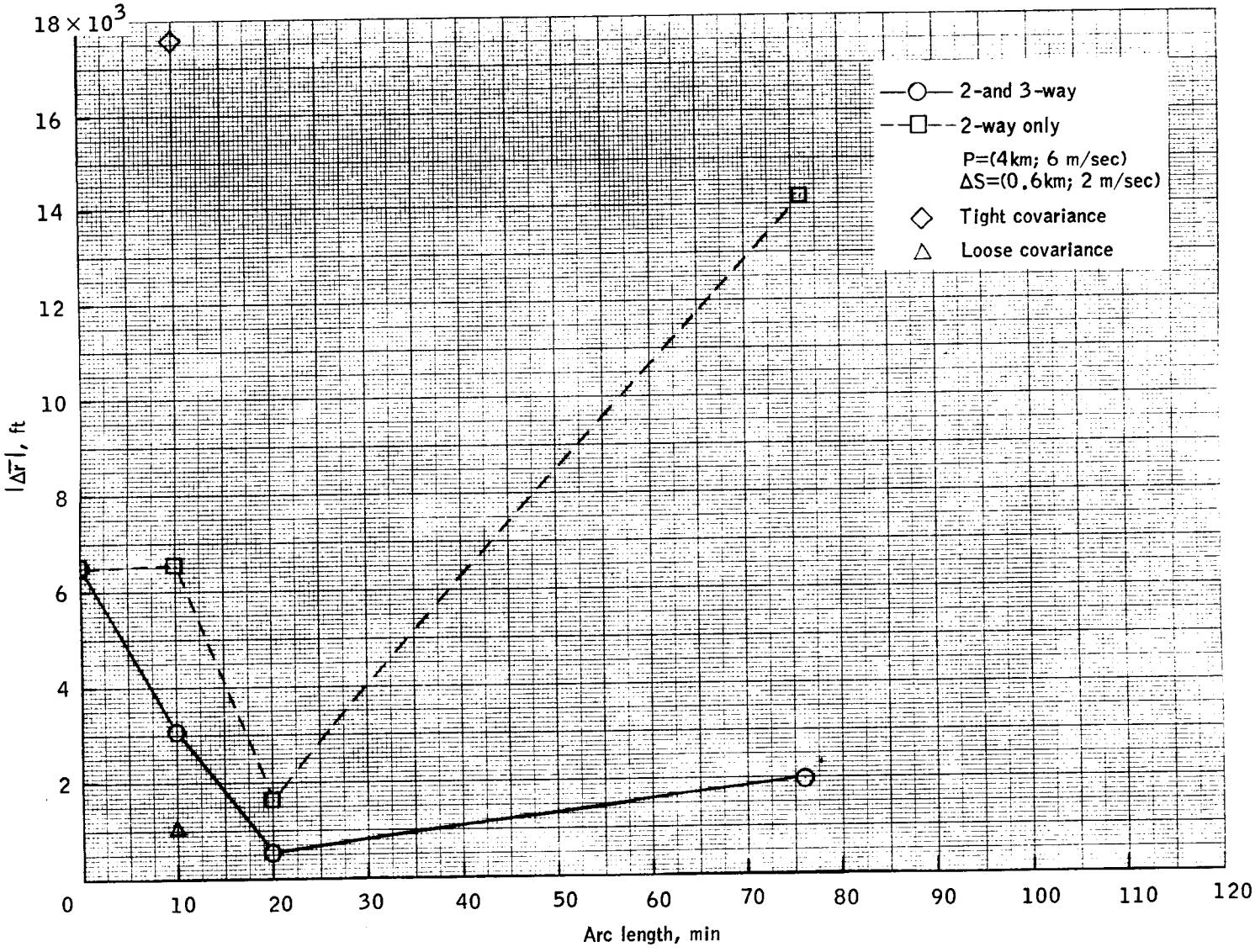


Figure 16.- Difference in position from the standard LM orbit at end of track.

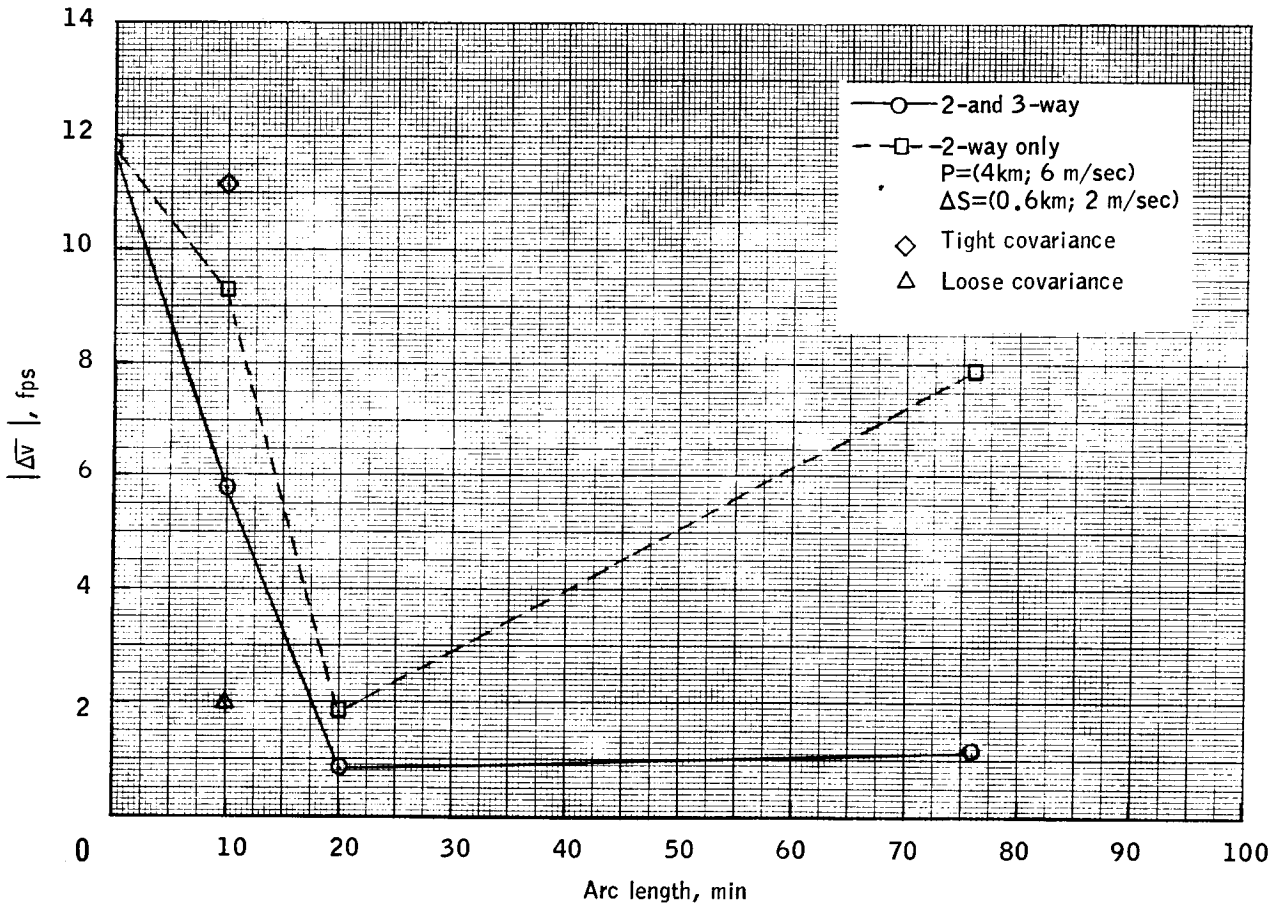


Figure 17. Difference in velocity from the standard LM orbit at acquisition.

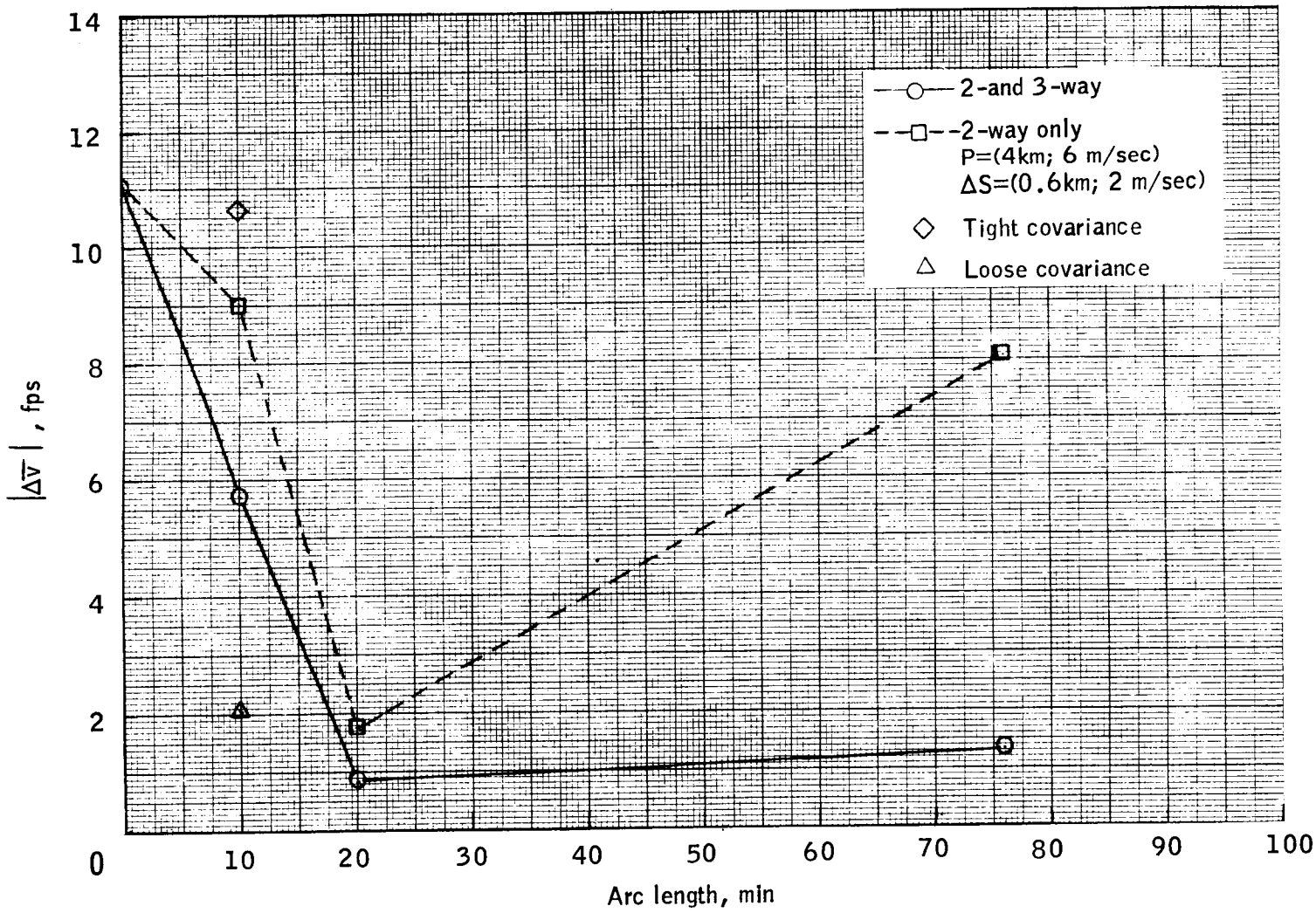


Figure 18. Difference in velocity from the standard LM orbit at end of track.

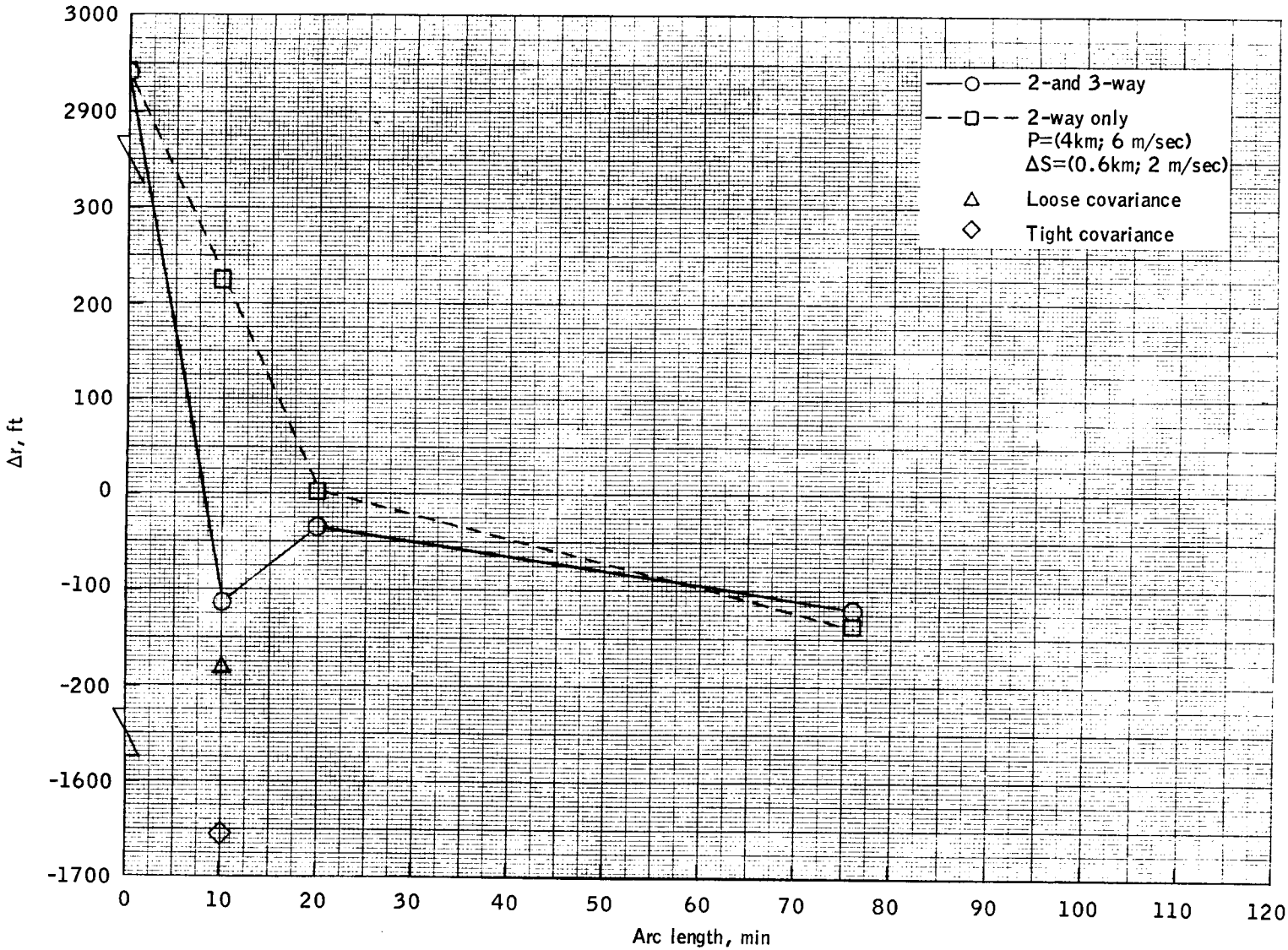


Figure 19.- Difference in radius from the standard LM orbit at acquisition.

249

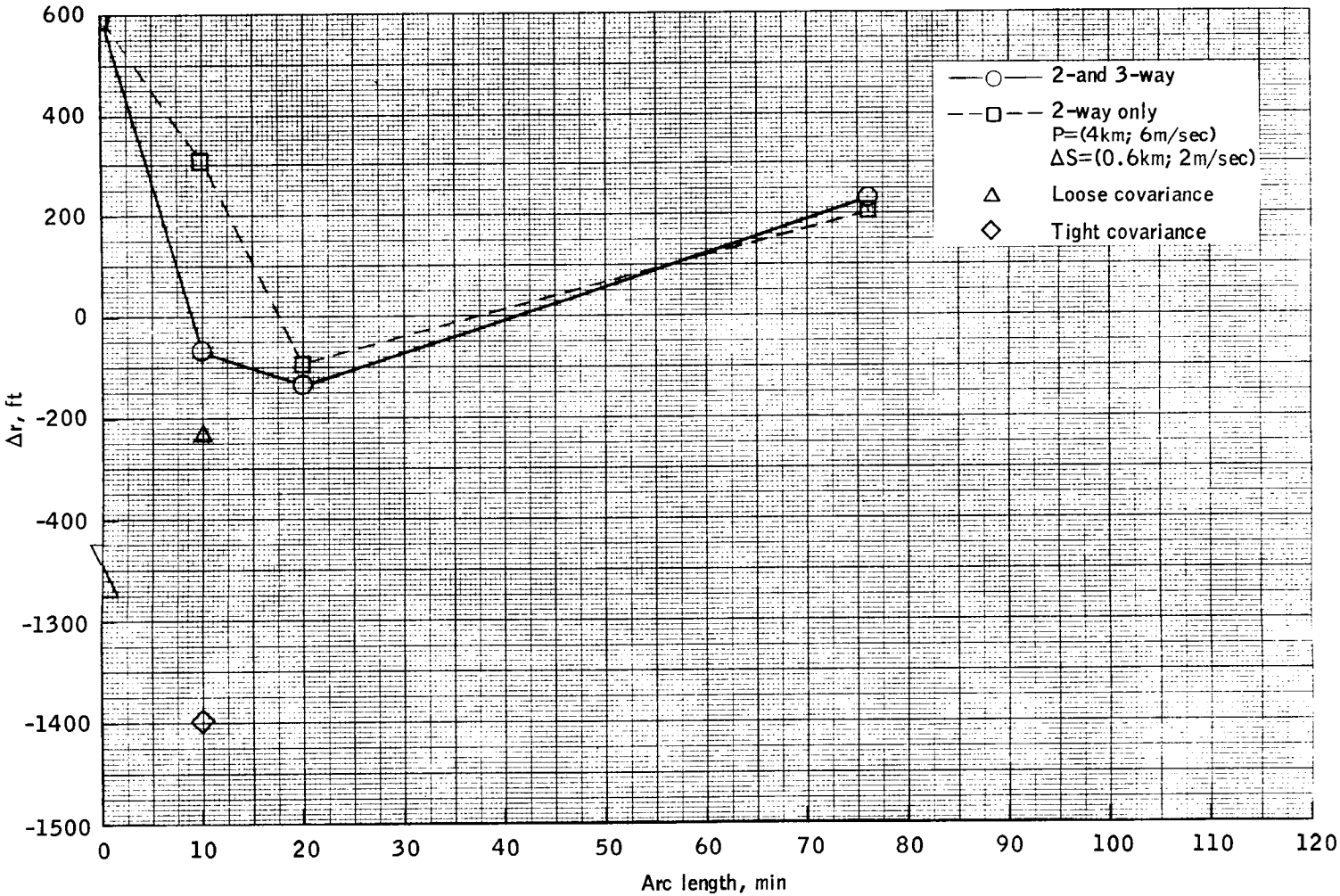


Figure 20.- Difference in radius from the standard LM orbit at end of track.

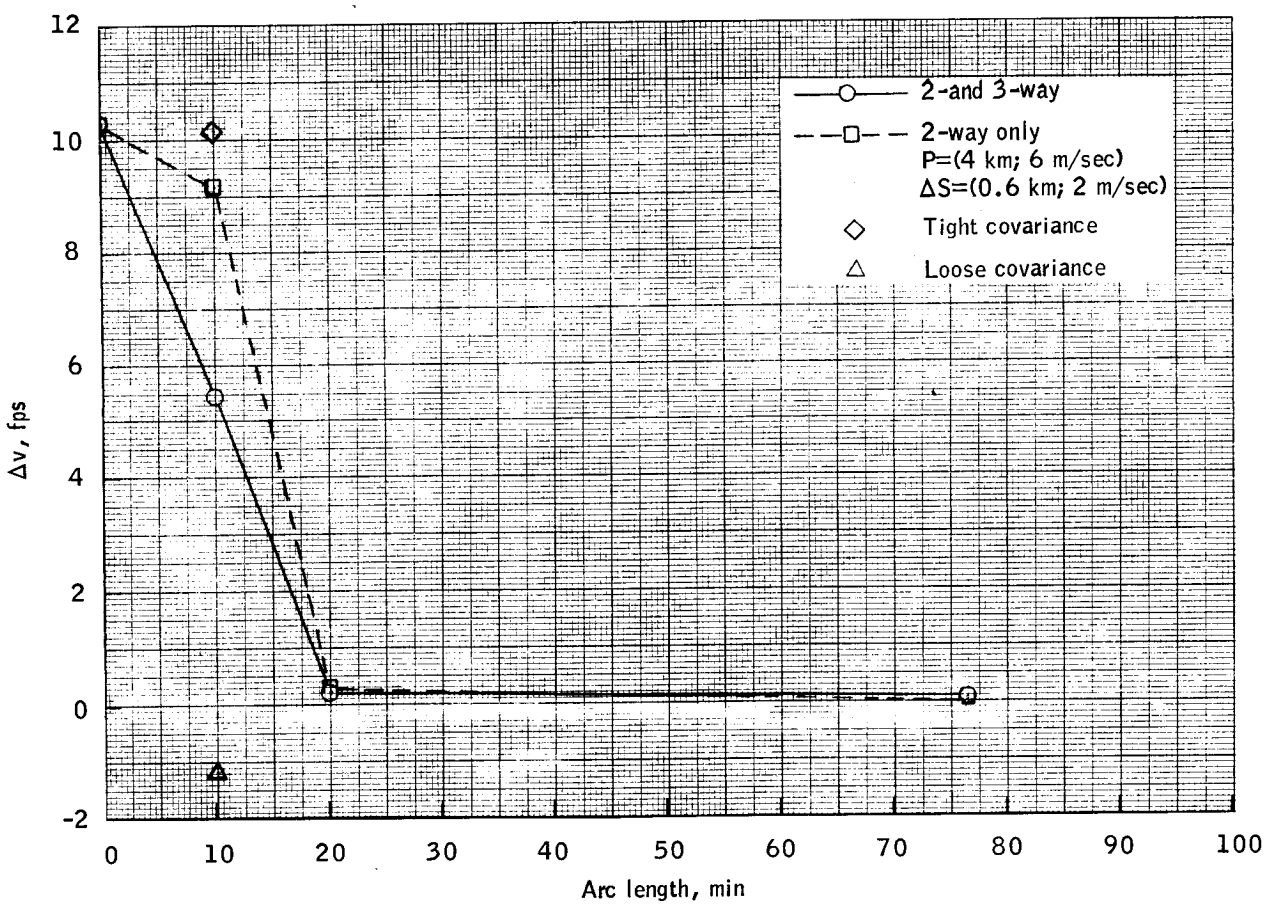


Figure. 21. Difference in speed from the standard LM orbit at acquisition.

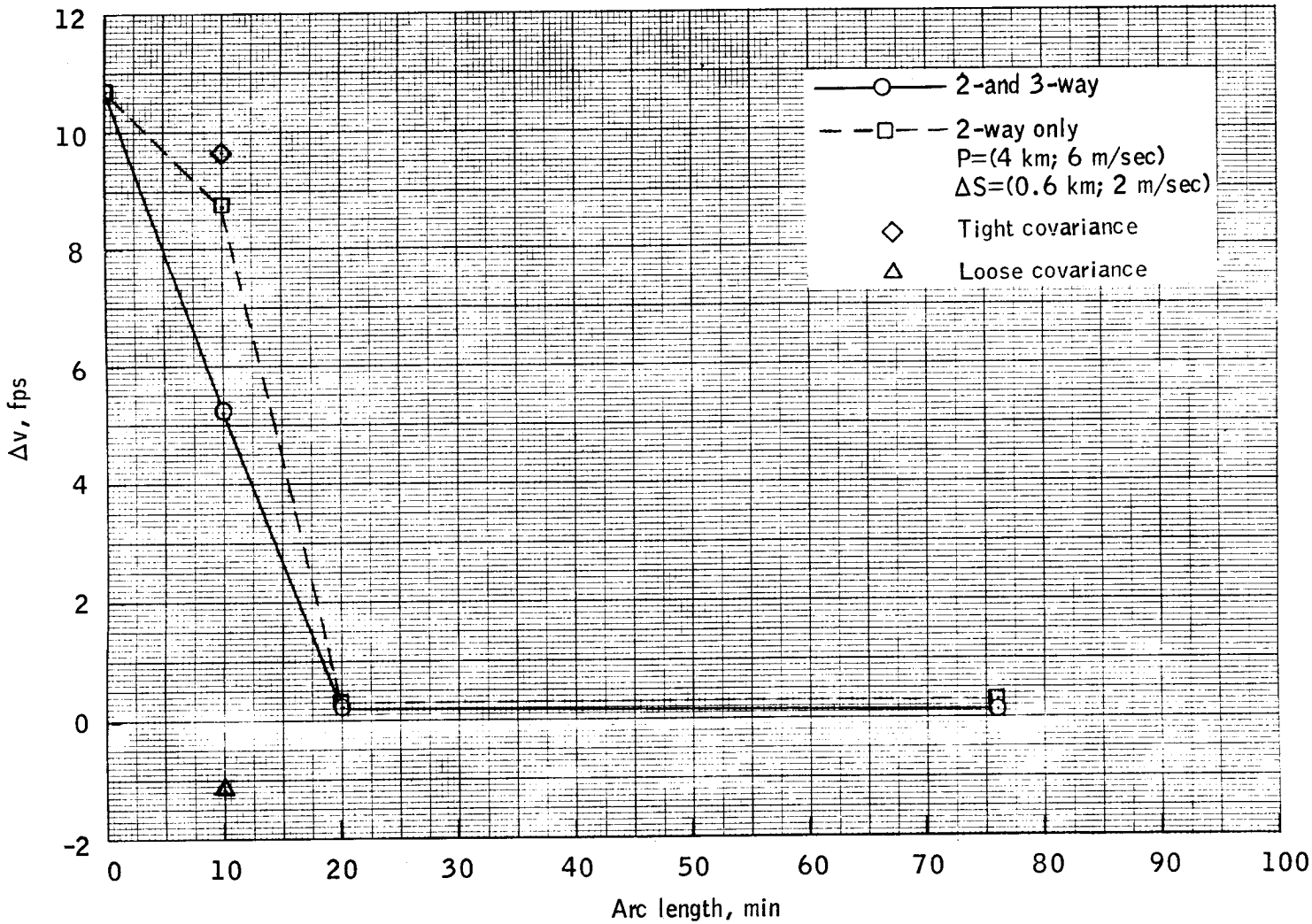


Figure. 22. Difference in speed from the standard LM orbit at end of track.

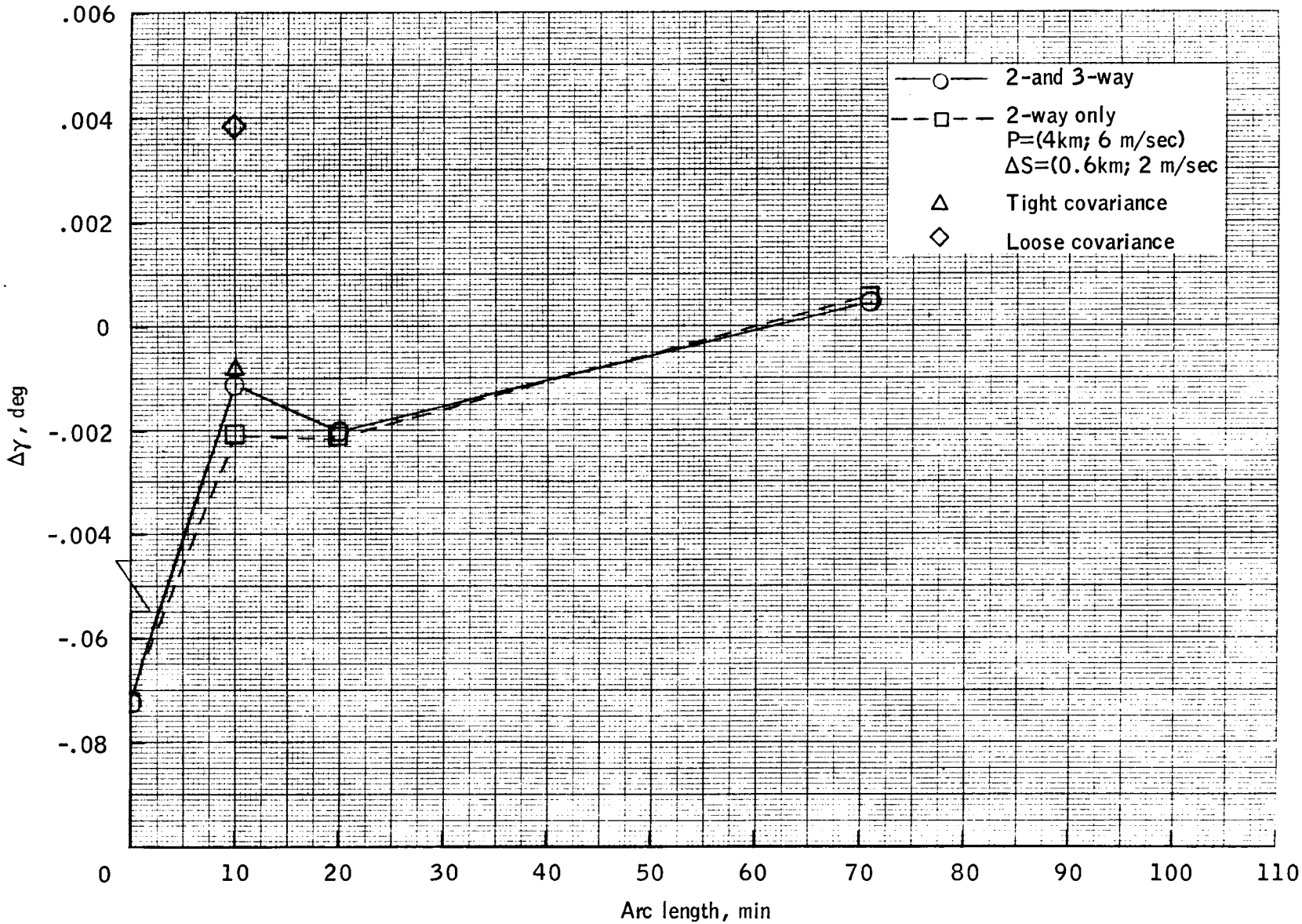


Figure 23.- Difference in flight-path angle from the standard LM orbit at acquisition.

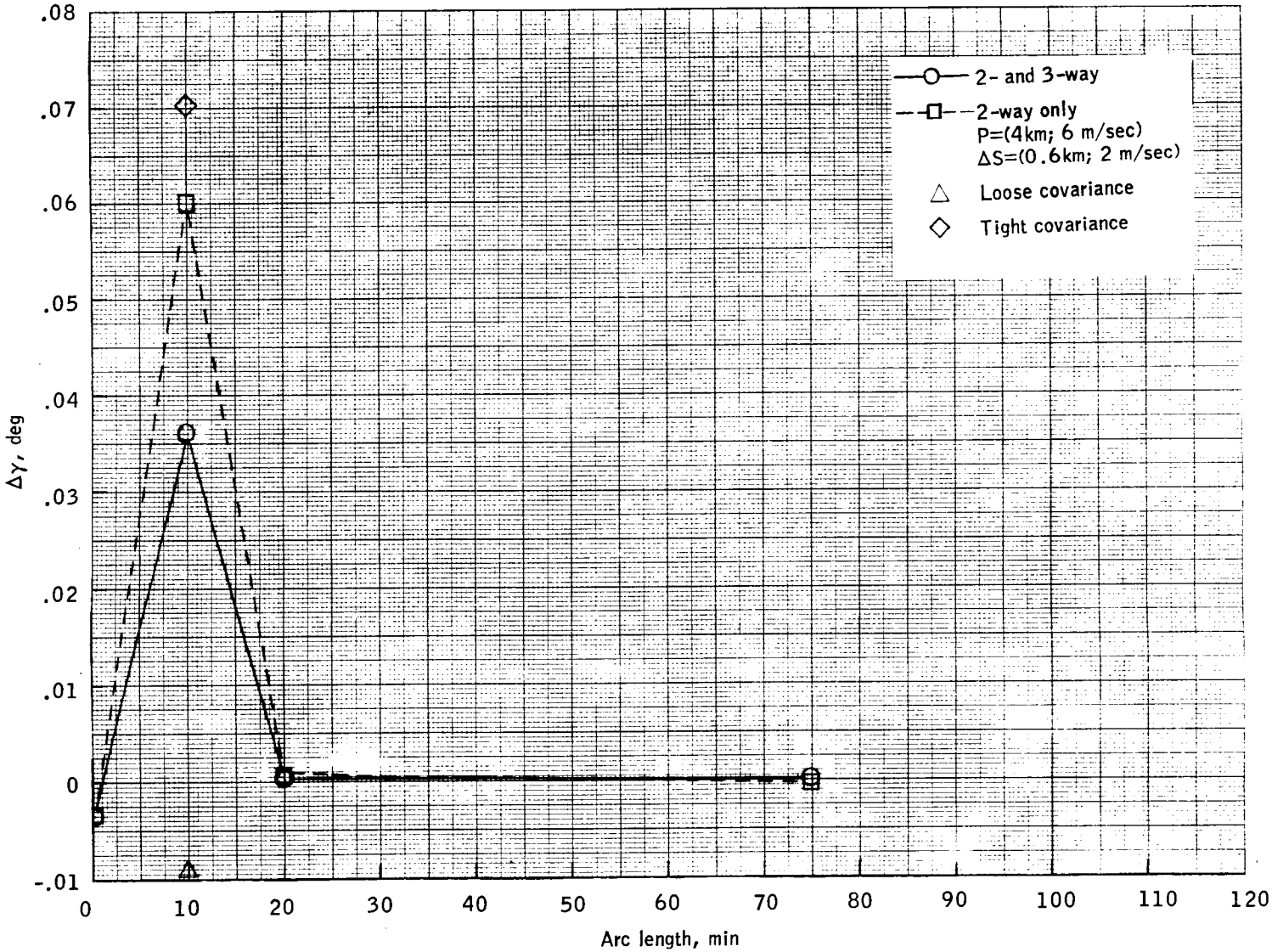


Figure 24.- Difference in flight path angle from the standard LM orbit at end of track.

REFERENCES

1. Schiesser, Emil R.: Langley Orbiter Navigation Trip. 66-FM42-324 November 28, 1966.

2. Engel, Jerome N.: Accuracy of The LM's Orbit. 66-FM42-341, Dec. 21, 1966.

3. Engel, Jerome N.: Results of A Lunar Orbit Determination Simulation Using Actual Langley Lunar Orbiter Data. 67-FM42-12, Jan. 23, 1967.

4. Wollenhaupt, W. R.; Trask, D. W.; Sjogren, W. L.; Piaggi, E. G.; Curkendall, D. W.; Winneberger, R. A.; Liu, A. S.; and Berman, A. R: Ranger VII Flight Path And Its Determination From Tracking Data. JPL TR 32-694, Dec. 15, 1964.

5. White, R. J.; Rosenberg, A. D.; Fisher, P. S.; Harris, R. A.; and Newhall, N. S.: Space-Single Precision Cowell Trajectory Program. JPL TM 33-198, Jan. 15, 1965.