NASA TECHNICAL NOTE

NASA TN D-6303

NASA TN D-6303

AIRBORNE METEOR OBSERVATIONS AT HIGH LATITUDES

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • JUNE 1971

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TN D-6303		

4. Title and Subtitle
AIRBORNE METEOR OBSERVATIONS AT HIGH LATITUDES

5. Report Date
June 1971

6. Performing Organization Code

7. Author(s)
K. Stuart Clifton

8. Performing Organization Report No.
M438

9. Performing Organization Name and Address
George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

10. Work Unit No.
124-09-14-0062

11. Contract or Grant No.

12. Sponsoring Agency Name and Address
National Aeronautics and Space Administration
Washington, D. C. 20546

13. Type of Report and Period Covered
Technical Note

14. Sponsoring Agency Code

15. Supplementary Notes
Prepared by the Space Sciences Laboratory, Science and Engineering Directorate.

16. Abstract

Meteor observations made by two low light level television systems, an image orthicon, and a secondary electron conduction vidicon, located aboard the 1969 NASA Airborne Auroral Expedition are discussed. The experiment is described, and analysis procedures are defined. A comparison is made of the results observed by the two systems. The meteor influx rates observed at latitudes between 50 and 80 deg are reported. The data are examined for diurnal, directional, and latitudinal effects. A detailed listing of the data is presented.

EDITOR'S NOTE

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17. Key Words (Suggested by Author(s))	18. Distribution Statement		
Meteor observations High latitudes Low light level television	13, 30		
19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	54	$3.00

*For sale by the National Technical Information Service, Springfield, Virginia 22151

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ACKNOWLEDGMENTS

Special thanks should be given to Michael Duggan, Dennis McCloud, and Wanda Neely whose help in analyzing the data proved most valuable.

AIRBORNE METEOR OBSERVATIONS AT HIGH LATITUDES

SUMMARY

An experiment conducted by the Space Sciences Laboratory of the Marshall Space Flight Center was placed aboard the 1969 NASA Airborne Auroral Expedition. The experiment consisted of two low light level TV systems, an image orthicon and a secondary electron conduction (SEC) vidicon-intensifier, for the purpose of making meteor and auroral studies. The observations were undertaken aboard a Convair 990 aircraft at latitudes between 50 and 80 deg.

The meteor data were analyzed with a total of 997 meteors detected. The meteor flux recorded by the SEC vidicon camera averaged 61.8 meteors per hour while that recorded by the image orthicon was 27.6 meteors per hour. The vidicon constituted a better meteor detector because of its ability to detect fast-moving objects. The results indicated that the large majority of meteors originated in the ecliptic plane with only a relatively small component of high inclination meteors observed. When displayed with local time, an increase of meteor rates was apparent in the early morning hours; a peak was reached around 0400 hr. Additional observations from lower latitudes are required in order to establish any definite latitude effect. However, the meteor flux rates obtained during the Auroral Expedition are lower than those recorded in Arizona in October 1969.

INTRODUCTION

A number of means have been used to investigate the near-earth meteoroid environment. Among them, photographic observations [1] have provided considerable information for meteors with masses of 10^{-1} g and larger. Penetration sensors located aboard spacecraft have measured the influx rates of meteoroids in the range from 10^{-6} to 10^{-9} g [2,3]. Radar has been utilized to investigate meteors with masses of 10^{-2} to 10^{-6} g [4].

Severe selection effects [5], however, inherent in the radar data have led to the desirability of using an alternate, optical means of investigation in this mass region. Such a means is suggested with the use of low light TV systems. Observations utilizing these systems have proved their effectiveness in the gathering of meteor data [6-8]. The use of low light level TV systems may ultimately extend optical measurements of faint meteors to 10^{-4} g. Such a

system coupled with fast optics has been developed for use by the Space Sciences Laboratory of the Marshall Space Flight Center during the past 2 years.

The Marshall Space Flight Center participated in the 1969 NASA Airborne Auroral Expedition for the purpose of making low light level TV observations of the aurora and of the meteor flux at high latitudes. The experiments were conducted with the use of an image orthicon and an SEC vidicon-intensifier. Observations were made between November 24 and December 18, 1969, aboard NASA 711, a Convair 990 aircraft, flying at altitudes approaching 12 192 m (40 000 ft). This report will be concerned with the results obtained from the meteor experiment. The data will serve as input to a comprehensive study of the meteoroid environment made with low light TV systems. All auroral data will be presented separately by a different author.

THE EXPERIMENT

Objectives

The Auroral Expedition presented a unique opportunity to observe the influx rates of meteors at latitudes in excess of 50 deg. In addition, information could be gathered regarding diurnal and directional effects upon the data. The high altitudes flown by the aircraft afforded seeing conditions superior to those of previous ground-based observations made from Huntsville, Alabama. Furthermore, the expedition provided one of the first tests of the SEC vidicon used as a meteor detector as well as the first opportunity to compare the data obtained with this system to those observed simultaneously with an image orthicon.

Equipment

The Marshall Space Flight Center experimental equipment consisted of two low light level TV camera chains: an image orthicon manufactured by Maryland Telecommunications, Inc., employing a General Electric 7967 tube, and an SEC vidicon-intensifier fabricated by Commercial Electronics utilizing a Westinghouse WL 32000 vidicon tube (a WL-30691 tube coupled to a WX 30677 single-stage image intensifier). The image orthicon and the SEC vidicon, both used for low light level applications, differ in target composition and construction as well as in the method of signal formation. Descriptions of each system are available in literature and will not be given here [9, 10]. A bright

meteor observed with the image orthicon is seen in Figure 1. Enlargement of the meteor image is due to a blooming effect of the tube.

Both cameras were fitted with 105 mm f/0.75 Delft Rayxar lenses. Each system was directed at the zenith through an optical glass window, although the optical axes of the two systems were shifted with respect to each other by approximately 1 deg. A filter box containing an adjustable aperture was placed in front of each lens in order to examine particular spectral regions. The adjustable aperture was used to compensate for the varying intensity of both the aurora and the nighttime sky background in order to produce an optimum picture. Stray light from inside the aircraft was prevented from reaching the systems by vinyl boots attached between the filter boxes and the windows.

Results were observed on Conrac monitors and were video taped by Ampex 660 C tape recorders with bandwidths of 4.2 MHz. Timing and positional data as well as descriptive comments were recorded on the audio channels of the video tape. Additional monitors were placed throughout the airplane to allow other experimenters to correlate their experiments with a real-time picture of overhead phenomena. A schematic of the experimental apparatus is portrayed in Figure 2. Figure 3 and 4 show the equipment as actually mounted aboard the aircraft. The foreground of Figure 3 shows the console containing camera control units and monitors. The image orthicon appears in the background above the console and in front of the SEC vidicon.

Approximately 45 hr of data were recorded by each system throughout a total of 14 flights occurring between November 24 and December 18. Nearly all flights were made between 50 and 80 deg of latitude. A typical flight path is shown in Figure 5. Individual observations lasted as long as 6 hr.

ANALYSIS PROCEDURES

Of the 45 hr of data recorded by each system only 21.3 and 11.7 hr of data recorded by the image orthicon and SEC vidicon, respectively, were considered usable for meteor analysis. Of these, 10.6 hr were recorded simultaneously. The reduction in time of usable meteor data occurred because of the stringent requirements concerning the darkness of the nighttime sky needed for the observation of faint meteors. Analysis was halted at any time that sky conditions deteriorated to the point where the limiting magnitude of stars was brighter than 9.5 or where obfuscating aurora might appear on any part of the video monitor. Moonlight, aurora, occasional haze, any use of filters, and occasional equipment failure were contributing factors to unacceptable analysis conditions.

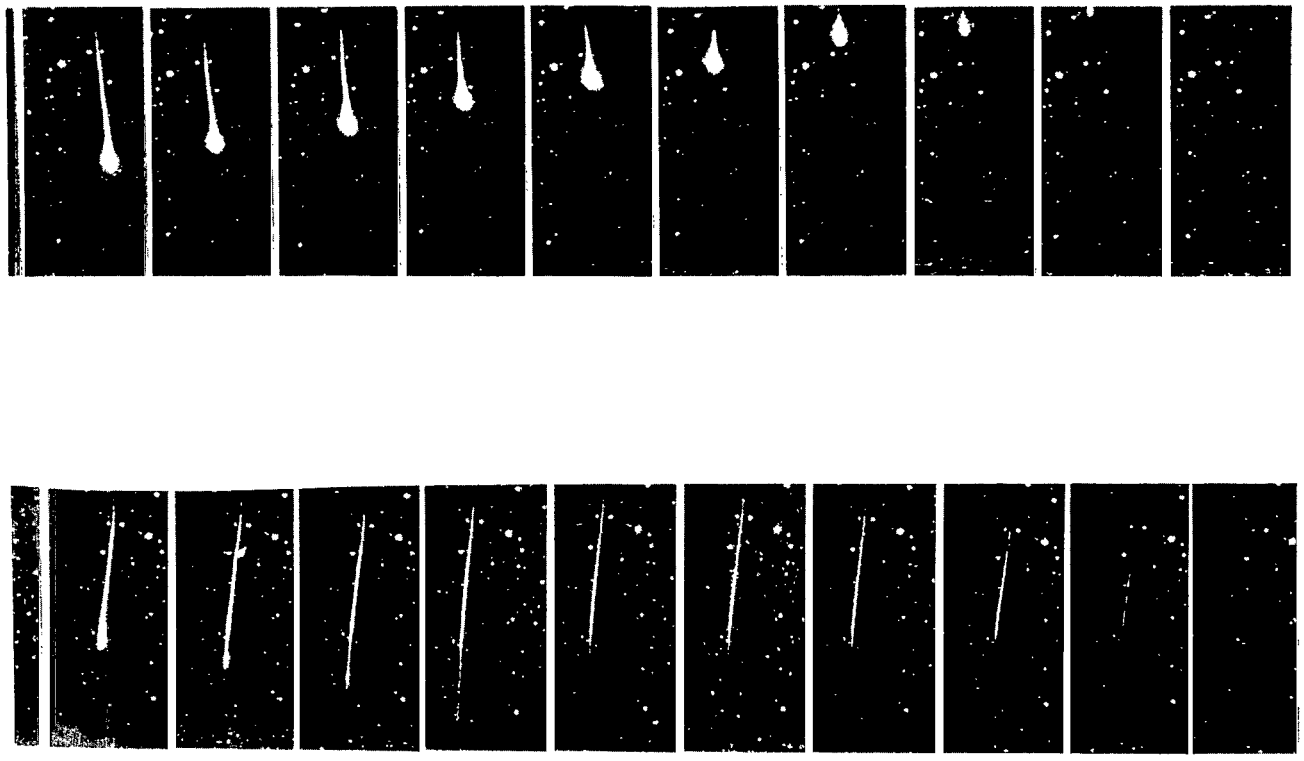


Figure 1. Sequence of photographs taken of a TV monitor as a bright meteor passed through the field of view of an image orthicon.

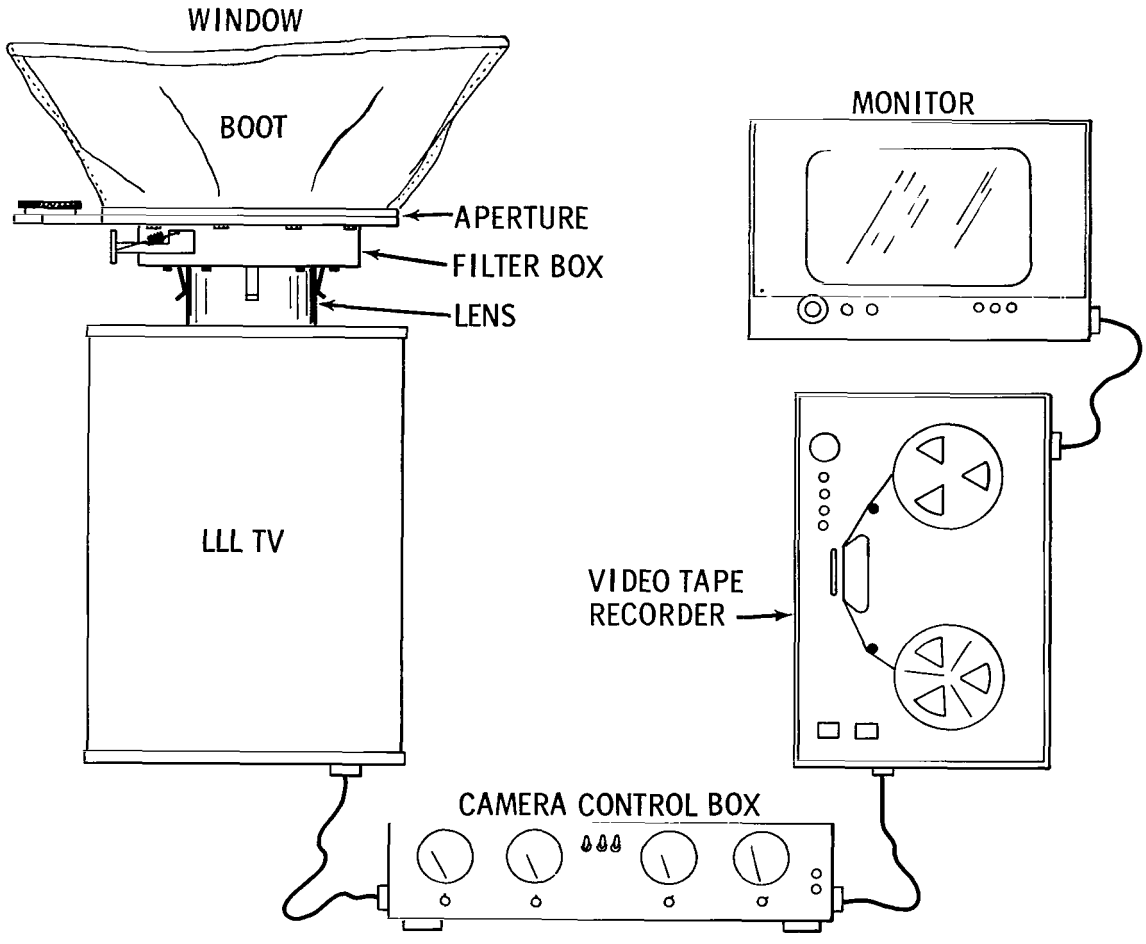


Figure 2. Schematic of equipment used to make TV observations of meteors and aurora.

Analysis of the video tapes was accomplished manually. Teams of three or more observers scanned overlapping areas on a TV monitor. When an event was ascertained as a meteor, its position on the monitor, apparent direction of flight, notation concerning brightness and speed, and position on tape (or tape index) were recorded. The universal and local times of each meteor were calculated from a correlation of timing information and the tape index.

Figure 3. Actual equipment used aboard the aircraft.

It was found that a second scanning of the vidicon and orthicon video tapes by the observers increased the total detected number of meteors by an average 18 percent. A third scanning of the tapes, however, increased the totals only negligibly. As will be shown later, the SEC vidicon forms a better meteor detector than does the image orthicon. For this reason, the SEC vidicon data formed the basis of most analyses performed on the data, and all vidicon tapes were scanned a second time. Those resulting from image orthicon observations were scanned only once. A listing of all observed meteors is found in the appendix.

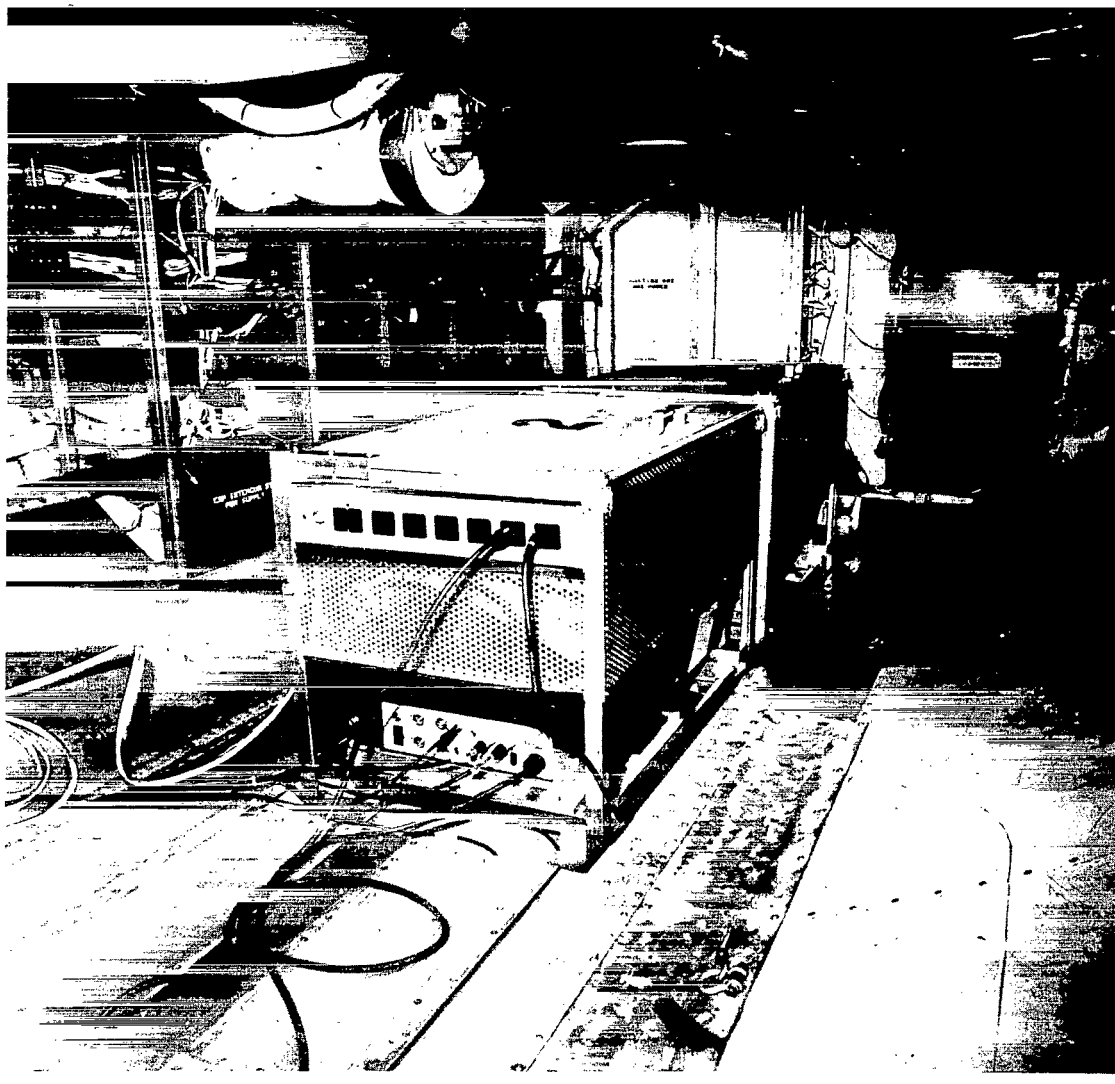


Figure 4. Video tape recorders used to record TV observations stored in the cargo hold.

While the manual scanning of tapes for meteors is somewhat tedious and time consuming, it is felt that this is the most accurate detection method available at the present time. The ability of the eye to discern fast moving objects allows it to distinguish meteors near noise level. To date there is no automatic means available for the detection of very faint, fast moving objects on a TV monitor.

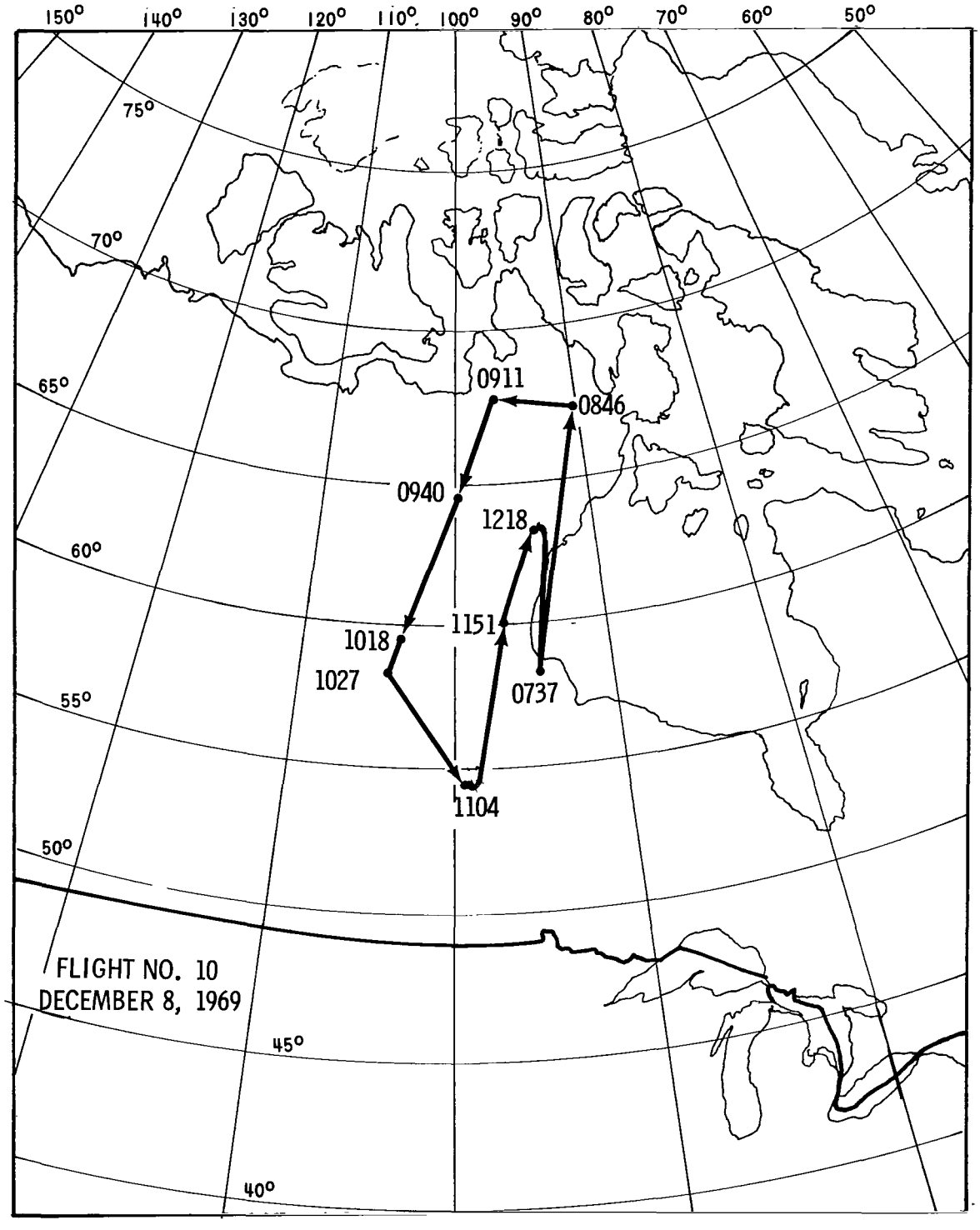


Figure 5. A typical flight path flown by the NASA 711 aircraft during the 1969 Auroral Expedition.

RESULTS

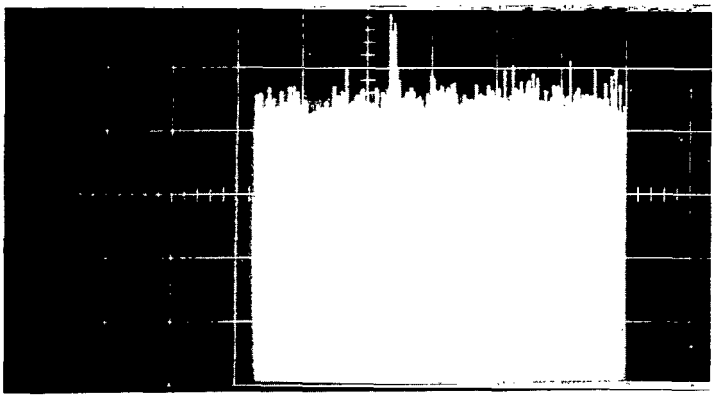
Comparison of the Two Systems

A total of 997 meteors were observed throughout the expedition by the two systems. Of these, 328 were observed by both systems; 399, by the SEC vidicon alone; and 270, by the image orthicon alone. However, these data include intervals during which only one system was taking data acceptable for meteor analysis. When only simultaneous observations are considered, the results indicate that of the 689 meteors recorded 328 were recorded by both systems; 327, by the SEC vidicon only; and 34, by the image orthicon alone.

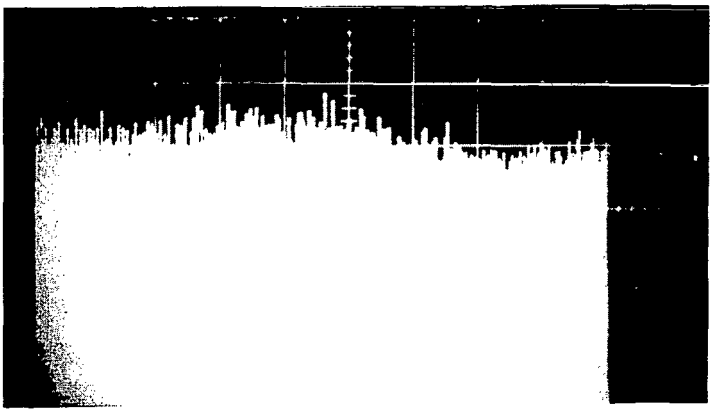
The fact that the optical axes of the two cameras were shifted by a degree may account for most, if not all, of the meteors recorded by the image orthicon but not seen by the SEC vidicon. However, this cannot account for the extremely large number of meteors detected by the SEC vidicon alone nor would the predictable addition of meteors resulting from a second scanning of image orthicon tapes provide a sufficient increase in numbers. It can only be concluded that a large number of meteors recorded by the SEC vidicon are below the detectability threshold of the image orthicon. As both systems are simultaneously able to detect stars to the same limiting magnitude, the difference must lie in the relative abilities of the two systems to detect fast moving objects.

The faster the angular rate of an object at constant brightness, the fainter it appears to the TV system. This results from the fact that a faster object has a faster writing speed across the photocathode and hence deposits fewer photons in each resolving element. The relationship of the log intensity to the log angular rate when plotted forms a straight line, the slope of which is dependent upon the nature of the TV system. The slope of this line for an SEC vidicon is less severe than that for the image orthicon, thus, the better detectability of the vidicon for fast moving objects. Calibrations of both systems are continuing in order that a valid comparison might be drawn, the results of which will be reported in the future.

An example of the relative detecting abilities of the SEC vidicon and the image orthicon of a very fast moving object is shown in Figures 6a and 6b. The figures portray the photometric light curves obtained from a meteor moving across the field of view at 37 deg/sec. While a definite spike is apparent from the vidicon data, the meteor is lost in the noise during image orthicon observations.



(a) SEC vidicon-intensifier



(b) Image orthicon

Figure 6. Comparison of the light curves of a very fast meteor recorded by the two TV systems (both scales are 2 V/cm).

The overall flux rate detected by the SEC vidicon during the Auroral Expedition was 61.8 meteors per hour. The rate recorded by the image orthicon was 27.6 meteors per hour. The fluxes observed during simultaneous observations were 63.6 and 35.1 meteors per hour recorded by the vidicon and image orthicon, respectively.

Diurnal Effects

The universal and local times throughout which meteor observations were made are shown in Figure 7. Occasional breaks in the data are not denoted. It should be noted that local times of observations are strongly dependent upon the flight path of the aircraft at high latitudes. "Daytime" observations were allowable because of the combination of seasonal and high latitude effects.

The local time distribution of meteoric flux was calculated from a consideration of the universal time and the position of the aircraft during each moment that a meteor was detected. Depending upon the latitude and the direction of flight, the rate of progression of local time varied considerably with that of universal time; e. g. , a 6-hr flight could conceivably be completed within 1 hr of local time, etc. Once the local time of each meteor was calculated, a local time distribution was determined. The results are shown in Table 1 where the data for each camera are distributed by flight number giving the duration of elapsed time spent within each hour of local time, the number of meteors observed within that time, and the resulting flux. The data for each hour of local time are then totaled over all flights and the resulting flux for that hour calculated. These data, forming a composite distribution of all flights, are then presented in Figure 8.

The figure portrays the hourly meteor flux observed by each system between the local times of 2000 and 0700 hr. No SEC vidicon results are available at 0100 hr accounting for the gap at that time. The figure demonstrates the consistently lower number of meteors recorded by the image orthicon when compared to the SEC vidicon results.

The ratio of meteor fluxes observed by the SEC vidicon to that of the image orthicon ranges from 1. 78 in the late evening hours to 2. 51 in the early morning indicating an increase during the early morning hours of a meteor component with higher angular rates. This is most likely because of the higher incidence during those hours of meteors with retrograde orbits entering the terrestrial atmosphere with high velocities.

Meteors entering the atmosphere at high velocities will release more energy per unit time and thus appear brighter. Thus, a number of meteors with magnitudes below the threshold of detectability at other times will become observable during the early morning hours. This, in part, accounts for the dramatic increase in meteor rates from 0200 to 0400 hr. The possibility that the earth actually intercepts more meteors during this interval may also be a major factor.

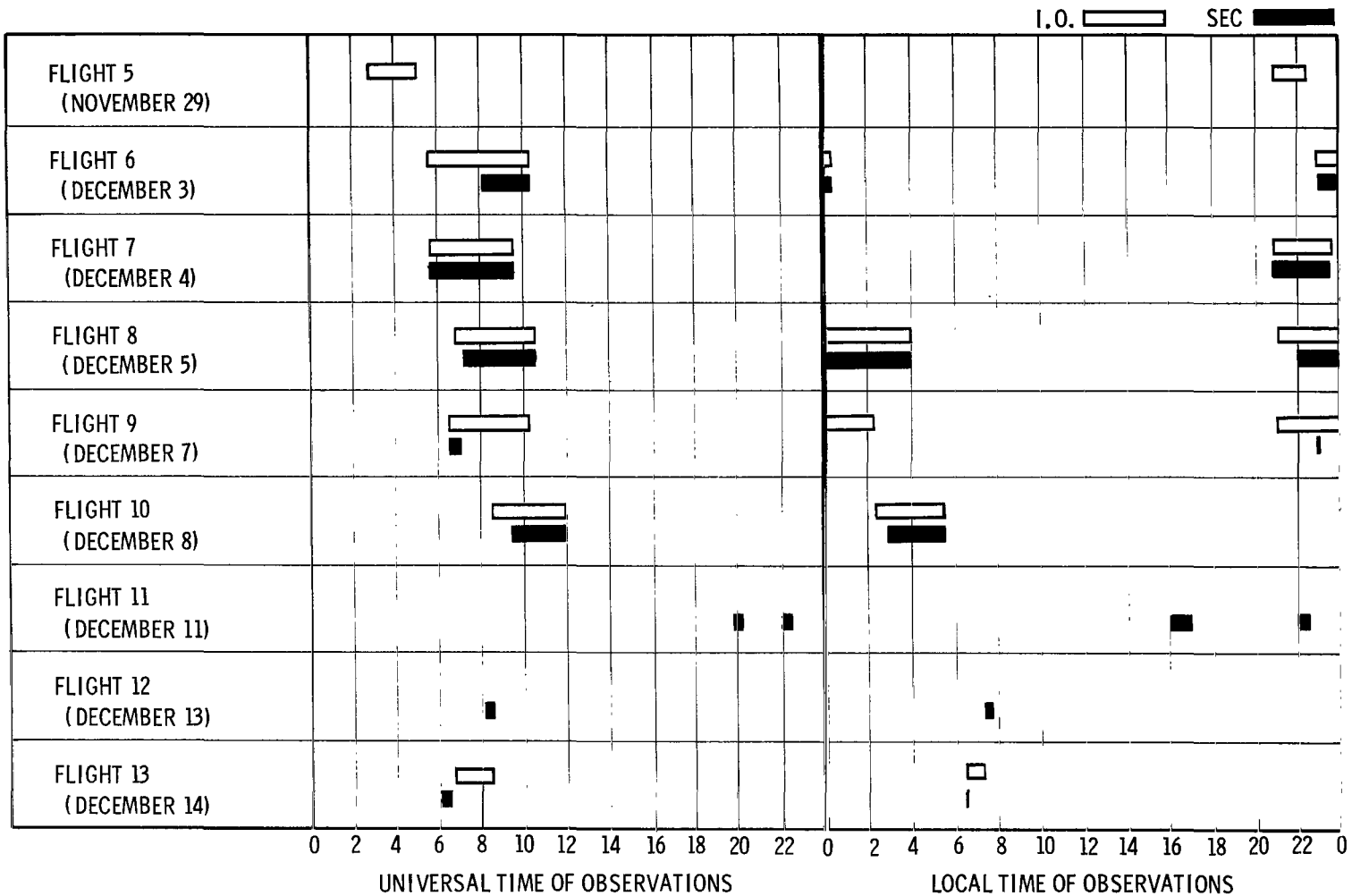


Figure 7. Times, both local and universal, for which meteor observations were conducted with the use of low light level TV systems.

TABLE 1. LOCAL TIME DISTRIBUTION RESULTS

Local Hour	Flight	SEC Vidicon			Image Orthicon		
		Duration (min)	Number	Rate (no/hr)	Duration (min)	Number	Rate (no/hr)
1600	11	13.35	9	40.4			
	Total	13.35	9	40.4			
1700	11	1.77	3	101.7			
	Total	1.77	3	101.7			
2000	7	6.97	3	25.8	13.36	2	9.0
	Total	6.97	3	25.8	13.36	2	9.0
2100	5				101.38	17	10.1
	7	101.20	32	19.0	120.14	36	18.0
	8				21.16	9	25.5
	Total	101.20	32	19.0	242.68	62	15.3
2200	5				38.45	6	9.4
	6				20.98	8	22.9
	7	32.67	18	33.0	32.46	12	22.2
	8	29.25	15	30.8	42.14	11	15.7
	9	23.57	11	28.0	33.08	8	14.5
	11	16.97	13	46.0			
	Total	102.46	57	33.4	167.11	45	16.2
2300	6	107.41	76	42.5	201.83	72	21.4
	7	47.64	39	49.1	68.48	38	33.3
	8	29.86	14	28.1	17.33	6	20.8
	9	8.74	4	27.5	23.40	5	12.8
	Total	193.65	133	41.2	311.04	121	23.3
0000	6	31.24	44	84.5	31.82	18	33.9
	8	2.62	4	91.6	27.55	19	41.4
	Total	33.86	48	85.1	59.37	37	37.4
0100	8				29.10	16	33.0
	9				21.11	13	36.9
	Total				50.21	29	34.7
0200	8	20.21	18	53.4	34.79	20	34.5
	9				18.60	7	22.6
	10	15.73	18	68.7	75.47	47	37.4
	Total	35.94	36	60.1	128.9	74	34.4

TABLE 1. (Concluded)

Local Hour	Flight	SEC Vidicon			Image Orthicon		
		Duration (min)	Number	Rate (no/hr)	Duration (min)	Number	Rate (no/hr)
0300	8	31.85	63	118.7	43.28	34	47.1
	10	69.26	112	97.0	68.22	60	52.8
	Total	101.11	175	103.8	111.50	94	50.6
0400	9				8.32	7	50.5
	10	44.94	122	162.9	44.16	51	69.3
	Total	44.94	122	162.9	52.48	58	66.3
0500	10	30.95	62	120.2	27.67	37	80.2
	13				54.92	14	15.3
	Total	30.95	62	120.2	82.59	51	37.1
0600	13	20.78	23	66.4	55.35	13	26.0
	Total	20.78	23	66.4	55.35	13	26.0
0700	12	18.62	24	77.3			
	13				4.2	2	28.6
	Total	18.62	24	77.3	4.2	2	28.6

Although a number of flights bordered on the Geminid meteor shower, this shower is considered to have been a negligible influence on the great majority of the data. The influx of meteors from the 1969 shower does not appear to have become a significant factor until after December 10 during which less than 10 percent of the Auroral meteor data was gathered. Furthermore, from Table 1 it may be seen that the majority of these data, accumulated during Flights 11, 12, and 13, gathered outside those local hours comprising the bulk of meteor data.

Directional Effects

A directional analysis was performed upon the data to determine whether the results indicated a large component of meteors with orbits of high inclination or a large component originating in the ecliptic plane. The apparent direction of each meteor with respect to the monitor was noted, and compensations were made for the varying directions flown by the aircraft. The results

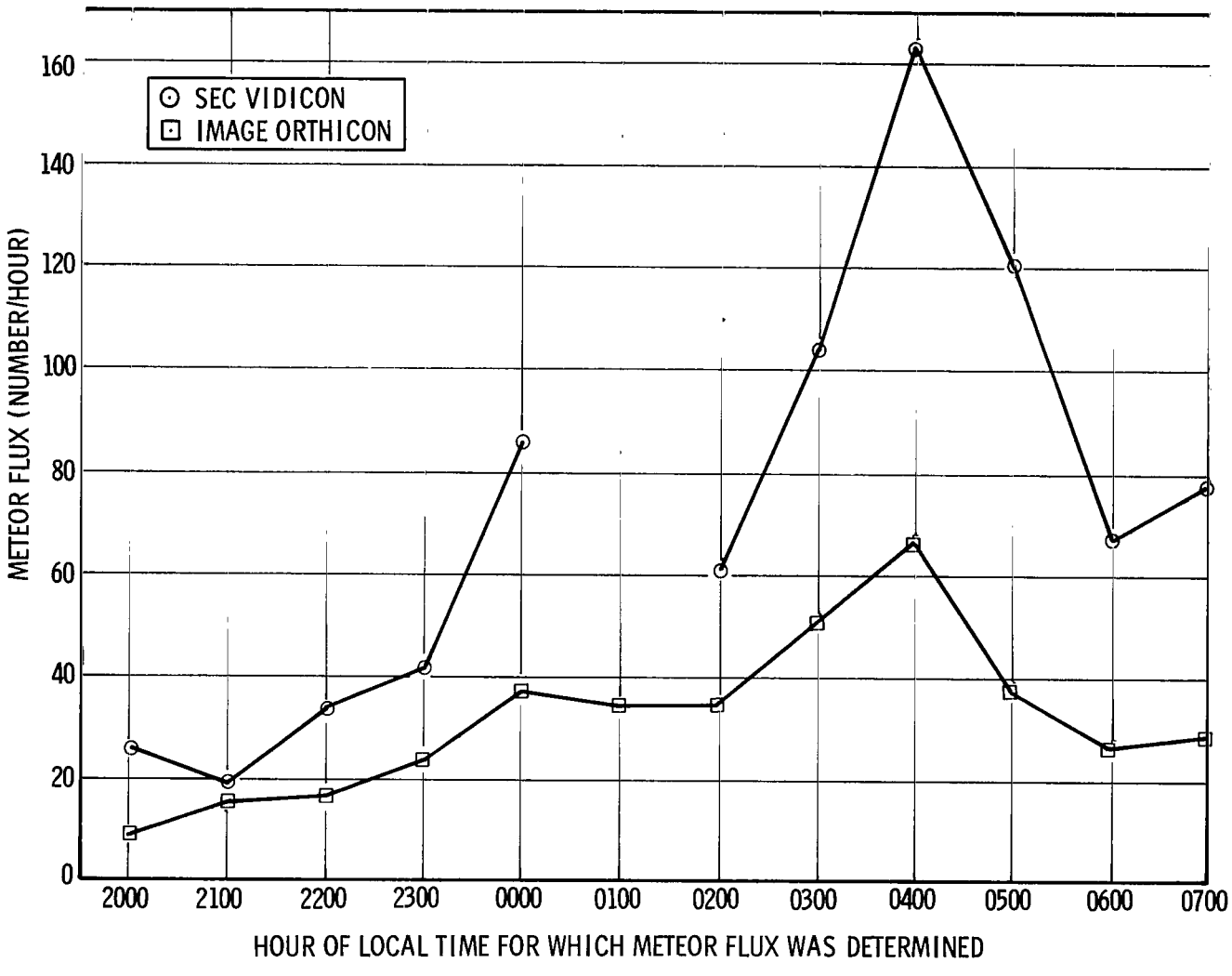


Figure 8. Diurnal distribution of meteor rates detected with the low light level TV systems.

shown in Figure 9 are displayed by degrees of true azimuth. As all observations were made at high altitudes, yet not in excess of 80 deg, high inclination meteors would be observed moving primarily towards the South (or azimuth 180 deg). Figure 9 also displays a strong peak for meteors moving towards an azimuth of 330 deg with a null located at 120 deg. The ratio of the maximum to minimum values is a factor of nearly five. No high inclination component of meteors of any significance is in evidence. Indeed, the pronounced trend of movement northward does indicate the origination of most of the observed meteors in the ecliptic plane.

A complicating factor in the observed directional results is once again the possible role played by the Geminid meteor shower. However, because of the relatively few observations made during the shower period and the changing position of the shower radiant with respect to the aircraft at the various times the observations were made, these data affected the overall results negligibly.

Latitudinal Effects

Upon examination of the data recorded by the image orthicon, few decisive conclusions can be maintained concerning the effects of latitude upon meteor flux. While the highest flux ever recorded by this system occurred during Flight 10 (nearly 80 in 1 hr), the overall average flux of 28.6 was slightly below the average collected from previous observations in Huntsville, Alabama, latitude 34.8 deg. A number of factors including the difference in seeing conditions, local times of observations, and influence of meteor showers occlude the significance of these values to date.

Comparison of SEC vidicon data taken during the Auroral Expedition with other similar observations has only recently been available. Eleven hours of data collected with excellent seeing conditions in October 1969 at Mt. Hopkins, Arizona, latitude 31.7 deg, show significantly higher fluxes than recorded during the Auroral Expedition. Preliminary results indicate the Mt. Hopkins data averaged nearly 2.5 times greater than the Auroral results throughout similar local times. However, these observations were not made at the zenith. Final analyses of these data are pending and will be reported in the future. Additional data from other observing sites are presently being analyzed to gain better statistics concerning a comparison of fluxes obtained at different latitudes.

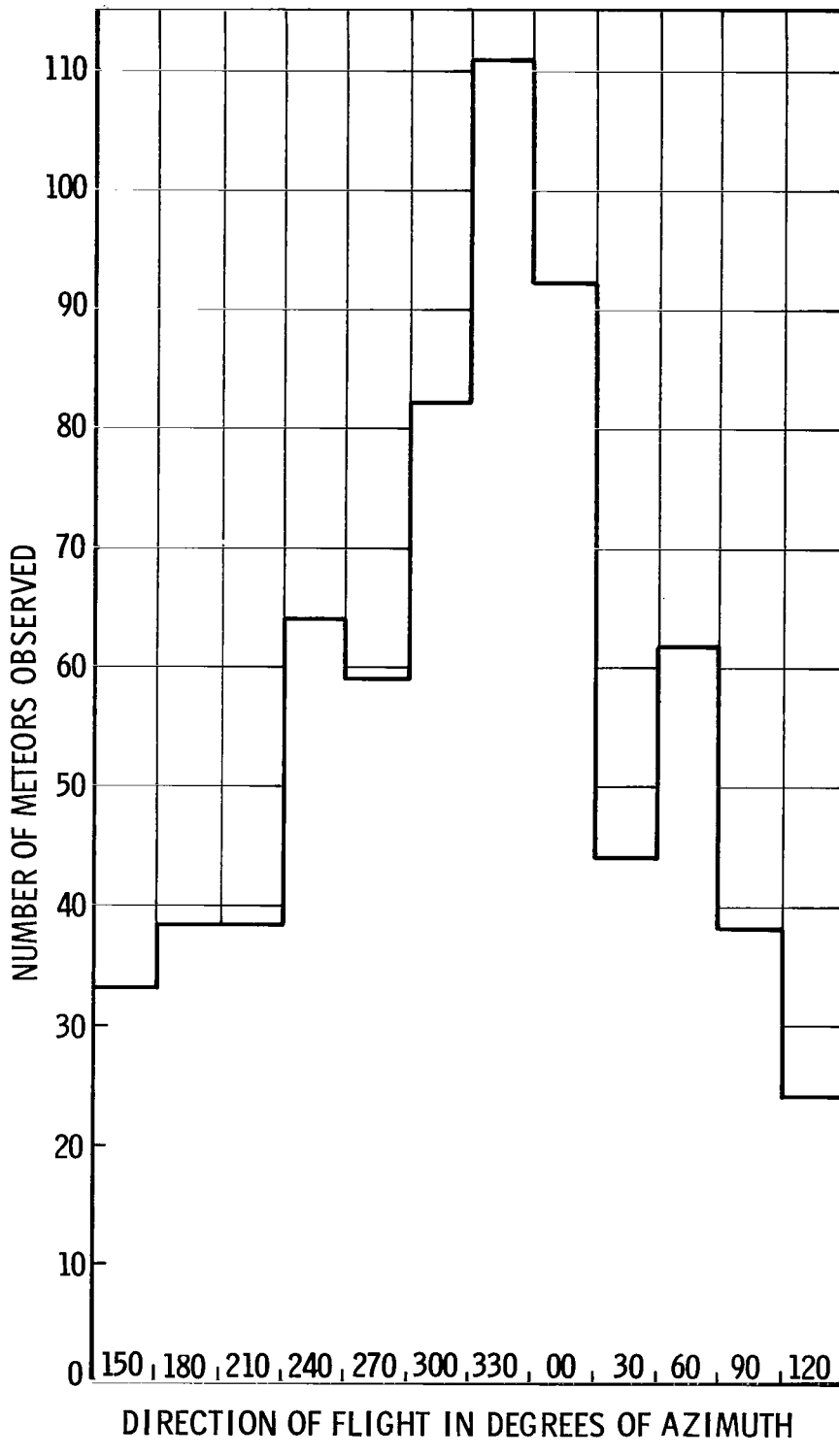


Figure 9. Directional distribution of observed meteors.

CONCLUSIONS

The results concerning meteor observations made with low light level TV systems during the 1969 NASA Airborne Auroral Expedition indicate that the SEC vidicon constitutes a superior meteor detector to the image orthicon because of its ability to discern faster moving objects. The meteor flux recorded by the SEC vidicon averaged 61.8 meteors per hour while that detected by the image orthicon was 27.6 meteors per hour. When displayed with local time a strong increase in meteor rates is observed during the early morning hours reaching a maximum at 0400 hr. No significant number of meteors with high inclination orbits was observed as the large majority of meteors seemed to originate in the ecliptic plane. The fluxes recorded by the SEC vidicon are substantially lower than similar results recorded at Mt. Hopkins in October 1969, but additional observations are needed to establish a definite latitude effect.

George C. Marshall Space Flight Center
National Aeronautics and Space Administration
Marshall Space Flight Center, Alabama 35812, October 29, 1970
124-09-14-0062

APPENDIX

A detailed listing of meteors observed on the 1969 NASA Airborne Auroral Expedition is presented in this appendix. Some of these data (tape index, position, brightness, and speed) are for use primarily by the investigators to identify particular meteors. The data are arranged by flight and by the camera system used in observation. Each meteor is listed by the following categories:

NO consecutive number of occurrence for each flight

IND tape recorder index at time of occurrence

UT[3] universal time of occurrence

POS position on the monitor where observed (L = left; C = center; R = right; T = top; and B = bottom)

DIR direction of motion with respect to the monitor. (Values are read as hours on the face of an imaginary clock superimposed on the face of monitor with 12 o'clock towards the top of the monitor.)

BR estimate of brightness (F = faint; M = medium; B = bright; and +'s and -'s give additional details.)

SP estimate of speed (F = fast; M = medium; B = bright; and +'s and -'s give additional details.)

L T[3] local time of occurrence

COR used with image orthicon data only, gives NO of SEC vidicon data with which meteor is correlated. (Blank spaces indicate no correlation made.)

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1. Below 1000 hr, zeroes preceding hour number are omitted.

FLIGHT 5 IO

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	21	245	C	7	B	M	2101	
2	200	258	LC	1	M	M	2111	
3	242	301	B	3	B	F	2113	
4	328	308	TC	11	F+	S	2115	
5	385	313	BL	5	F	S	2115	
6	395	314	C	5	F+	M	2116	
7	407	315	LC	6	F	F	2116	
8	485	321	BC	8	B	M	2116	
9	576	329	C	5	M	M	2118	
10	678	339	TL	9	F	F	2119	
11	695	340	T	6	F	F	2119	
12	703	341	RC	5	F+	M	2119	
13	752	346	L	11	B	F	2125	
14	817	352	BC	12	F	F	2132	
15	850	356	BR	4	F+	S	2136	
16	953	406	LC	4	F	F	2142	
17	1044	416	LT	8	M	M	2151	
18	1162	429	LC	8	M+	M	2205	
19	1200	434	C	4	B	F	2206	
20	1281	443	LB	2	B	M	2208	
21	1371	454	BC	7	F+	F	2223	
22	1418	500	BC	8	B	F	2230	
23	1473	507	TC	1	F	M	2236	

FLIGHT 6 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	671	807	LC	3	F	S	2312	
2	671	807	RC	3	F	F	2312	
3	702	810	LB	4	F	M	2312	
4	720	812	RC	12	B	S	2312	
5	728	812	T	9	B	F	2312	
6	757	815	RC	6	B	VF	2311	
7	759	815	B	8	F+	VF	2311	
8	767	816	BR	8	F	F	2311	
9	782	818	LC	1	VF	VF	2311	
10	807	820	TR	5	F	F	2311	
11	830	822	TR	10	F	F	2311	
12	869	826	BR	11	M	S	2311	
13	876	827	BL	4	F	M	2311	
14	883	828	RC	3	B	M	2311	
15	888	829	C	10	VF	M	2311	
16	897	829	TC	12	M	M	2311	
17	927	832	R	7	B	F	2311	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
18	933	833	BR	4	F	M	2311	
19	940	834	BL	8	B	F	2311	
20	958	836	BL	12	F	M	2312	
21	967	836	TC	10	F	F	2312	
22	974	837	RC	5	M	S	2313	
23	999	840	BL	8	F	M	2316	
24	1011	841	TR	11	F+	F	2317	
25	1023	842	RC	8	F	M	2318	
26	1041	844	TR	8	M	S	2320	
27	1046	845	LC	11	F	F	2321	
28	1062	847	LC	5	F	F	2323	
29	1083	849	RC	1	F	F	2325	
30	1101	851	RC	10	F	M	2327	
31	1137	855	C	10	VF	VF	2331	
32	1171	859	TC	10	M+	F	2335	
33	1173	859	RC	1	M	M	2335	
34	1213	904	C	6	F	F	2338	
35	1229	906	RC	1	F	F	2339	
36	1234	906	BL	5	M	M	2339	
37	1250	908	C	4	F+	F	2340	
38	1258	909	BR	5	M	F	2340	
39	1271	911	RB	5	M+	F	2341	
40	1290	913	RB	1	M	F	2342	
41	1333	918	C	2	F	F	2344	
42	1338	919	C	5	F	F	2345	
43	1340	919	RC	1	M+	S+	2345	
44	1398	926	TL	10	B	M	2348	
45	1404	927	TR	11	F	F	2348	
46	1415	928	TL	2	B	F	2349	
47	1416	928	TL	4	F	F	2349	
48	1417	928	BR	11	M	S	2349	
49	1420	929	TL	2	B	M	2349	
50	1435	931	BL	4	F+	F	2350	
51	1439	931	C	5	VB	M	2350	
52	1440	931	RC	4	F	F	2350	
53	1456	933	RC	1	F	F	2351	
54	1471	935	TL	2	M	S	2352	
55	1472	935	LC	10	M	M	2352	
56	1474	935	C	1	F+	M	2352	
57	1480	936	TC	7	M	M+	2353	
58	1481	936	BC	11	F	S	2353	
59	1493	938	TC	1	M	M	2353	
60	1506	939	BC	5	F	F	2354	
61	1506	939	RC	4	F	M	2354	
62	1509	940	TR	1	F+	M	2354	
63	1517	941	TR	7	F	M	2355	
64	1531	943	BL	4	F+	F	2356	
65	1536	943	TC	10	B	M	2356	
66	1559	946	RC	11	F	M	2357	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
67	1566	947	C	2	F+	M	2358	
68	1566	947	C	11	F	M	2358	
69	1574	948	LC	1	M	M+	2358	
70	1580	949	RC	4	F	F	2359	
71	1580	949	LC	11	F+	F	2359	
72	1581	949	LC	12	M	F	2359	
73	1588	950	RC	12	VF	M	2359	
74	1591	951	TL	1	M	F	2359	
75	1598	951	BC	7	M	F	2359	
76	1598	951	BC	5	F+	F	2359	
77	1599	952	BL	10	M	M	0000	
78	1613	953	C	1	F+	M	0000	
79	1621	954	C	11	B	M+	1	
80	1623	955	LC	4	F	F	1	
81	1628	955	TR	3	F+	M	1	
82	1630	956	BC	5	F	M	2	
83	1641	957	C	1	F+	M	2	
84	1647	958	TL	6	F	F	3	
85	1647	958	C	1	F	F-	3	
86	1650	958	BL	5	F+	F	3	
87	1652	959	BL	4	M	VF	3	
88	1653	959	LC	7	F+	M	3	
89	1665	1000	TL	8	F+	M	4	
90	1667	1001	BL	1	F	M	4	
91	1673	1001	BL	12	F	M+	4	
92	1674	1002	TL	4	F	F	4	
93	1678	1002	TR	10	M	S+	4	
94	1699	1005	LC	12	F+	M	6	
95	1700	1005	C	2	F	F	6	
96	1709	1006	C	12	VF	M	6	
97	1709	1006	TR	8	F+	M	6	
98	1710	1006	RC	11	F	F	6	
99	1714	1007	TR	3	F+	M	7	
100	1715	1007	TL	6	F+	F-	7	
101	1717	1007	LC	1	F	F	7	
102	1723	1008	RC	6	F	F	7	
103	1730	1009	TR	6	F	F	8	
104	1732	1009	TC	6	F	F	8	
105	1733	1010	RC	11	M-	S	8	
106	1737	1010	LC	1	F+	M	8	
107	1738	1010	LC	11	F+	S+	8	
108	1744	1011	TL	2	F	M	9	
109	1745	1011	BC	12	B	M	9	
110	1749	1012	BC	5	M	M	9	
111	1786	1017	RC	9	F	F	14	
112	1788	1017	BR	11	F	F	14	
113	1789	1017	RC	7	F	F	14	
114	1791	1018	RC	4	M	M	15	
115	1796	1018	LC	10	B	VF	15	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
116	1801	1019	TR	5	M+	S+	17	
117	1803	1019	LC	2	B	M	17	
118	1812	1021	C	8	B	M+	19	
119	1824	1022	C	9	B	M	21	
120	1825	1022	BR	7	F	F	21	

FLIGHT 6 IO

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	550	538	BR	5	M	M	2256	
2	555	539	BL	11	F	M	2256	
3	619	544	BL	6	B	F	2258	
4	621	544	C	6	F+	F	2258	
5	635	546	LC	7	F+	F	2259	
6	648	547	LC	5	F	M	2259	
7	657	548	BC	7	M	M	2259	
8	657	548	C	8	F	M+	2259	
9	689	551	LC	4	F	M	2300	
10	735	555	C	11	F+	F	2301	
11	1010	623	TR	4	M	F	2306	
12	1016	624	BC	4	M	M	2306	
13	1046	627	C	6	B	M	2307	
14	1077	631	BC	7	F	F	2307	
15	1140	638	BL	10	B	M	2309	
16	1209	646	RC	7	B	F	2310	
17	1234	649	C	2	B	S	2310	
18	1240	649	RC	5	M+	F	2310	
19	1241	650	LC	10	B	F	2310	
20	1269	653	RC	4	F+	F	2312	
21	1298	656	C	4	F	F	2311	
22	120	716	C	5	M+	M	2315	
23	190	721	BL	9	B	M	2315	
24	231	725	TR	2	M	S+	2315	
25	260	727	TR	9	F+	F	2316	
26	262	727	TR	4	M	S	2316	
27	269	728	C	5	B	M	2316	
28	310	731	TC	10	M	F	2316	
29	362	735	BL	5	M+	S	2315	
30	364	735	TR	8	F+	F	2315	
31	394	738	BR	11	B	S	2315	
32	400	738	C	10	B	M	2315	
33	479	745	C	2	M	S	2314	
34	486	745	TR	4	M	M	2314	
35	520	748	BR	9	F	F	2314	
36	565	752	C	5	B	M	2314	
37	631	753	BL	5	F	M	2313	
38	723	807	TC	3	F	S	2312	1

NO	IND	UT	POS	DIR	BR	SP	LT	COR
39	724	807	RC	3	F	M	2312	2
40	754	810	LB	4	F	F	2312	3
41	772	812	RC	12	B	S	2312	4
42	779	813	TC	9	F+	M+	2312	5
43	804	815	C	6	VF	VF	2311	6
44	807	815	BR	8	F	M+	2311	7
45	814	816	BC	8	F	VF	2311	8
46	853	820	TC	5	F	M	2311	10
47	876	822	TR	10	F	M	2311	11
48	914	826	BC	11	M+	S	2311	12
49	928	828	RC	3	B	S+	2311	14
50	941	829	TC	12	F+	M	2311	16
51	970	832	TR	7	B	F	2311	17
52	983	834	BL	8	M	F	2311	19
53	1017	837	C	5	M	M	2313	22
54	1041	840	BL	8	F	M	2316	23
55	1065	843	C	8	F+	M	2319	26
56	1103	847	C	5	F	F	2323	28
57	1141	851	RC	10	F+	M	2327	30
58	1157	854	BR	11	F	S	2330	
59	1210	859	TC	10	M	M	2335	32
60	1212	859	RC	1	F+	M	2335	33
61	1288	908	C	4	F	F	2340	37
62	1295	909	BR	5	F+	F	2340	38
63	1308	911	BR	5	M	F	2341	39
64	1328	913	BR	1	F	M	2342	40
65	1372	919	BL	5	F	M	2344	42
66	1375	919	C	1	F+	M	2345	43
67	1451	928	TL	2	B	M	2349	46
68	1471	931	C	5	VB	M	2350	51
69	1472	931	RC	4	F	F	2350	52
70	1506	935	LC	2	F	M+	2352	54
71	1511	936	TL	7	F	M	2352	57
72	1525	938	TC	1	B	M	2353	59
73	1567	943	TC	10	B	S	2356	65
74	1596	947	C	2	F+	M	2358	67
75	1596	947	C	11	F	M	2358	68
76	1611	949	RC	4	F	M	2359	70
77	1611	949	LC	11	F+	M	2359	71
78	1612	949	LC	12	F	M	2359	72
79	1628	951	LB	7	F	F	2359	75
80	1629	951	BC	5	F	F	2359	76
81	1630	952	LB	10	M+	M	0000	
82	1643	953	C	1	F	F	0000	
83	1651	954	C	11	B	F	1	79
84	1658	955	TC	3	F	F	1	81
85	1671	957	BC	1	F+	F	2	83
86	1676	958	TL	6	F-	F	3	84
87	1694	1000	TL	8	F	F	4	89

NO	IND	UT	POS	DIR	BR	SP	LT	COR
88	1707	1002	TR	10	M	F	4	93
89	1762	1010	RC	11	F	M	8	105
90	1774	1011	BC	12	M	M	9	109
91	1778	1012	BL	5	F+	F	9	110
92	1818	1017	RC	9	F	F	14	111
93	1820	1018	RC	4	F	F	15	114
94	1829	1019	RC	5	B	M	17	116
95	1831	1019	TL	2	B	F	17	117
96	1840	1021	LC	8	B	F	19	118
97	1852	1022	LC	9	B	M	21	119
98	1853	1022	RC	7	F	M	21	120

FLIGHT 7 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	24	538	BR	7	F+	M	2052	
2	61	540	RC	12	B	F	2055	
3	82	542	TR	8	M	F	2058	
4	115	544	C	8	M-	M	2100	
5	118	544	BR	8	M	M+	2100	
6	142	546	LB	11	F	F	2103	
7	206	551	LC	11	F	M	2110	
8	213	551	LC	8	F+	F	2110	
9	253	554	LC	7	B	S	2113	
10	363	603	C	4	M	S	2112	
11	462	611	BC	6	F+	F	2111	
12	511	615	BL	6	M	M	2111	
13	548	619	TR	6	F	M	2111	
14	567	620	LC	10	F	F	2110	
15	571	621	BR	12	F+	M	2110	
16	624	626	TL	11	F+	M	2110	
17	640	627	TL	11	F+	M	2110	
18	642	627	BR	12	F	F	2110	
19	664	629	RC	11	B	F	2110	
20	671	630	BC	7	F	F	2110	
21	688	631	LB	6	F+	M	2109	
22	777	640	LC	11	F	M	2109	
23	798	642	TC	6	F+	M	2108	
24	835	646	TL	10	F	F	2108	
25	874	650	BR	12	B	S	2108	
26	934	656	BL	8	B	M	2107	
27	980	701	LC	11	B	S	2109	
28	1284	735	C	12	M	M	2132	
29	1335	741	RC	2	F	F	2142	
30	1345	742	LC	1	F	F	2143	
31	1366	745	RT	1	B	F	2148	
32	1382	747	RB	8	F	F	2152	

NO	IMD	UT	POS	DIR	BR	SP	LT	COR
33	1386	747	RB	8	F	F	2152	
34	1386	747	RT	10	F	F	2152	
35	1412	751	BR	7	M	M	2159	
36	1419	752	TL	1	B	S+	2200	
37	1441	754	BL	1	F+	F	2204	
38	1463	757	LB	1	F	F	2210	
39	1472	758	TL	1	F	F	2212	
40	1474	758	BL	8	B	S+	2212	
41	1502	802	BL	12	VF	F	2219	
42	1518	804	LC	8	M	M	2222	
43	1521	804	LC	10	F	F	2222	
44	1526	805	TL	9	F	M	2224	
45	1533	806	RC	12	M	F	2226	
46	1544	807	C	8	M	M	2227	
47	1561	810	TR	1	F+	F	2233	
48	1564	810	TC	8	B	S	2233	
49	1582	812	C	1	F	M	2236	
50	1594	813	LC	9	F	F	2239	
51	1631	819	C	11	F	F	2249	
52	1634	819	BL	2	F	F	2249	
53	1661	823	TR	8	F	F	2258	
54	1679	825	TR	4	F	M	2302	
55	1681	826	LT	2	F+	F	2302	
56	1698	828	BR	8	F	M	2304	
57	1701	828	RT	7	M	M	2304	
58	1712	830	LT	12	F+	S+	2305	
59	1737	833	BR	8	F+	S	2307	
60	1756	836	BR	2	M+	VS	2311	
61	1765	837	BC	10	B	S	2312	
62	1797	841	BC	1	B	S	2314	
63	1810	843	LC	7	F+	M+	2315	
64	1822	845	C	8	B	M	2316	
65	1822	845	TL	11	M	M	2316	
66	1987	909	TL	10	M	M	2329	
67	1988	909	LC	9	B	S	2329	
68	1991	909	LC	1	F+	M	2329	
69	1995	910	BR	6	F	F	2329	
70	2001	911	BC	5	B	F	2330	
71	2003	911	RC	4	M	F	2330	
72	2005	911	TR	2	F	S	2330	
73	2007	912	TC	2	F	F	2330	
74	2014	913	C	4	F	M+	2331	
75	2024	914	T	4	B	F	2331	
76	2024	914	C	1	F	F	2331	
77	2029	915	RC	5	B	M	2332	
78	2031	915	LC	1	F	F	2332	
79	2033	916	BR	2	F	F	2332	
80	2045	917	TR	1	B	F	2333	
81	2049	918	BR	4	F	F	2333	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
82	2063	920	TC	12	M	S	2334	
83	2070	921	BC	4	F+	M	2335	
84	2076	922	RC	2	F	F	2335	
85	2078	922	RC	6	F	S	2335	
86	2081	923	BC	5	M	F	2336	
87	2092	923	TR	1	F	F	2336	
88	2100	926	LC	5	M	F	2338	
89	2128	930	RC	4	F	S	2340	
90	2142	932	C		B		2341	
91	2144	932	C	1	F+	F	2341	
92	2145	933	TC	2	B	F	2341	

FLIGHT 7 IO

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	45	540	TR	12	B	F	2055	2
2	63	542	TC	8	B	M+	2058	3
3	190	551	BR	7	F	F	2110	
4	201	551	LC	8	F+	F	2110	8
5	242	554	LC	7	B	F	2113	9
6	322	600	RC	1	F	F	2112	
7	350	603	BC	4	M	M	2112	10
8	534	619	TR	6	M	F	2111	13
9	610	626	TL	11	M	F	2110	16
10	626	627	LC	11	M-	M	2110	17
11	629	627	BC	12	M	F	2110	18
12	650	629	RC	10	VB	F	2110	19
13	657	630	BC	7	M	M	2110	20
14	674	631	LB	6	M	F	2109	21
15	697	634	RC	7	F	F	2109	
16	728	637	BL	1	F	S	2109	
17	783	642	TC	6	F	F	2108	23
18	860	650	BC	12	B	F	2108	25
19	919	656	TC	10	F	F	2107	
20	920	656	BL	8	B	M	2107	26
21	966	701	L	11	B	M	2109	27
22	987	703	LC	8	F	F	2110	
23	994	704	C	4	M	M	2110	
24	1101	716	C	9	F+	M	2115	
25	1102	716	BL	4	M	M	2115	
26	1107	716	TL	2	M	M	2115	
27	1108	716	RC	3	F+	F	2115	
28	1121	718	BL	3	M+	S	2116	
29	1154	722	BR	6	M	M	2117	
30	1264	735	LC	12	B	M	2132	28
31	1315	741	RC	2	F	F	2142	19
32	1325	742	LT	1	F	F	2143	30

NO	IND	UT	POS	DIR	BR	SP	LT	COR
33	1346	745	TC	1	B	F	2148	31
34	1348	745	TC	10	F	F	2148	
35	1363	747	LC	8	F	F	2152	
36	1364	747	RC	8	F	F	2152	32
37	1366	747	RB	8	F	F	2152	33
38	1393	751	BC	7	M	M	2159	35
39	1399	752	TL	1	B	M	2200	36
40	1421	754	BL	1	F	F	2204	37
41	1453	758	LB	8	M	M	2212	40
42	1497	804	LC	8	B	F	2222	42
43	1513	806	BR	12	M	F	2226	45
44	1524	807	C	8	M	M	2227	46
45	1541	810	TR	1	F+	M	2233	47
46	1544	810	T	8	B	M+	2233	48
47	1561	812	LC	1	F+	M	2236	49
48	1564	813	LC	8	F+	VF	2238	50
49	1616	819	TR	1	F	M	2249	
50	1641	823	TR	8	F	M	2258	53
51	1659	825	RC	4	F	F	2302	54
52	1666	826	TL	2	F	F	2302	55
53	1680	828	TR	7	M	M	2304	57
54	1691	830	C	3	F	F	2305	
55	1691	830	TL	12	F	F	2305	58
56	1733	836	BR	11	F	S	2311	
57	1735	836	RC	2	M+	S	2311	60
58	1744	837	BC	10	M	S	2312	61
59	1777	841	BL	1	M	M	2314	62
60	1788	843	TL	7	F	F	2315	63
61	1800	845	C	8	M+	M	2316	64
62	1800	845	TL	11	F	F	2316	65
63	1832	849	BC	5	B	F	2318	
64	1341	851	TC	9	M	S	2319	
65	1853	852	TL	4	F	F	2319	
66	1854	854	BC	2	F	F	2320	
67	1856	854	C	6	F	F	2320	
68	1857	857	RC	7	F	M	2321	
69	1893	858	BR	5	F+	F	2322	
70	1906	900	LC	4	F	F	2323	
71	1921	902	RB	5	M	F	2324	
72	1941	905	TL	3	M	F	2326	
73	1944	906	TC	1	F	F	2327	
74	1964	909	LC	9	M	S	2329	67
75	1967	909	TL	1	F+	F	2329	68
76	1978	911	LB	5	B	F	2330	70
77	1980	911	RC	4	F+	F	2330	71
78	1981	911	TR	2	F	F	2330	72
79	1991	913	LC	4	F	F	2331	74
80	2001	914	TC	4	B	F	2331	75
81	2006	915	TR	5	B	F	2332	77

NO	IND	UT	POS	DIR	BR	SP	LT	COR
82	2010	916	BR	2	F+	M	2332	79
83	2040	920	TC	12	F	M	2334	82
84	2047	921	BC	4	F	M	2335	83
85	2054	922	C	6	F	F	2335	85
86	2058	923	BC	5	M	F	2336	86
87	2105	930	RC	4	F	F	2340	89
88	2121	932	C	1	F+	F	2341	91

FLIGHT 8 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	438	708	RC	4	F	M	2206	
2	447	709	BR	4	F	M	2208	
3	483	712	RC	1	B	F	2215	
4	489	712	TC				2215	
5	523	715	TL	2	F+	M+	2221	
6	568	719	TR	8	F+	S	2230	
7	584	721	BR	3	F	F-	2234	
8	632	725	BR	4	F	M	2242	
9	656	727	LC	12	B	S	2246	
10	670	729	C	11	F	M	2251	
11	680	730	RT	2	F	F	2253	
12	689	731	RC	1	F	M	2255	
13	696	731	BL	10	B	S	2255	
14	705	732	C	4	F+	M	2257	
15	709	732	TC	10	B	S	2257	
16	738	735	BL	5	F+	F	2303	
17	755	737	TL	4	F	S	2308	
18	776	739	LC	5	F	S	2312	
19	828	744	TL	11	F+	S	2322	
20	857	747	LC	12	B	S+	2329	
21	929	754	BC	9	F	S	2342	
22	933	755	TL	11	F	F	2344	
23	947	756	TC	7	F	S	2346	
24	952	757	TC	2	F	F	2347	
25	965	758	TL	7	B	S	2349	
26	969	759	BC	3	F+	M	2351	
27	972	759	RC	11	F	M+	2351	
28	980	800	BL	10	F	F	2353	
29	996	802	TC	3	F	M+	2356	
30	1016	804	BL	7	F	F	0000	
31	1024	805	TC	11	M+	M	2	
32	1037	806	LB	2	M	F	4	
33	1037	806	C	1	F	F	4	
34	1658	921	C	4	F	S	236	
35	1662	922	CL	8	B	M	238	
36	1664	922	LC	5	F	M	238	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
37	1668	923	BC	10	F+	F	240	
38	1673	923	C	11	F+	S+	240	
39	1675	924	RC	6	M+	S+	242	
40	1676	924	BL	10	B	F	242	
41	1677	924	BC	7	F+	M	242	
42	1687	925	TR	10	VF	VF	243	
43	1689	926	RC	8	M	M	246	
44	1702	927	LC	10	B	M	247	
45	1710	928	C	12	F	F	248	
46	1721	930	RT	12	M	S	250	
47	1734	932	BL	1	F	F	252	
48	1747	934	RT	12	F+	M	254	
49	1762	936	TL	4	F	S	256	
50	1764	936	C	11	M	S+	256	
51	1777	938	LB	3	F	F	258	
52	1797	940	C	11	M	M	300	
53	1805	942	TC	2	M+	M	302	
54	1806	942	RC	11	M	M	302	
55	1809	942	BC	10	M	M	302	
56	1813	943	BC	3	M	F	303	
57	1817	943	RC	2	M	F	303	
58	1957	1003	LT	1	B	M+	323	
59	1957	1003	BR	2	F+	F	323	
60	1958	1003	BR	1	M	F	323	
61	1967	1005	BC	3	M-	F	325	
62	1973	1006	TL	1	F	F	326	
63	1979	1007	BC	1	F	F	327	
64	1984	1007	BC	2	B	F	327	
65	1986	1008	BL	10	B	S	328	
66	1994	1009	BR	2	M+	M	329	
67	1994	1009	LC	1	F+	M	329	
68	1995	1009	LC	1	M	F	329	
69	1996	1009	RC	2	F	F	329	
70	2007	1011	BC	4	F	F	331	
71	2010	1011	BL	4	F	F	331	
72	2013	1012	BC	1	F	F	332	
73	2022	1013	LC	2	F	F	333	
74	2026	1013	BR	1	F	F	333	
75	2031	1014	C	10	B	M	334	
76	2035	1015	C	3	F	F	335	
77	2036	1015	BR	2	B	F	335	
78	2040	1016	LC	4	F	F	336	
79	2042	1016	LC	2	F+	VF	336	
80	2047	1016	BL	4	M+	F	337	
81	2047	1017	LC	10	F	M	337	
82	2047	1017	LC	8	F	F	337	
83	2048	1017	TR	11	F	F	337	
84	2051	1017	C	10	F	M	337	
85	2052	1017	BC	2	B	F	337	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
86	2052	1017	BR	11	F	F	337	
87	2053	1019	TR	1	M	F	339	
88	2055	1019	RB	7	F	F	339	
89	2058	1019	BL	10	M+	F	339	
90	2059	1019	TC	2	F	F	339	
91	2063	1019	LC	10	M	F	340	
92	2065	1019	BL	10	B	F	340	
93	2067	1020	LC	10	F	S	342	
94	2069	1020	TC	10	F	F	342	
95	2070	1020	LC	11	M	S+	342	
96	2070	1020	LT	11	F	F	342	
97	2072	1020	RC	11	F	F	342	
98	2076	1021	RC	11	B	S	343	
99	2079	1021	RC	8	F	M	343	
100	2089	1023	BL	7	M	F	346	
101	2094	1024	TR	7	F	F	348	
102	2101	1025	BR	7	F	F	349	
103	2106	1026	LC	11	B	F	350	
104	2107	1026	TL	4	M	M	350	
105	2107	1026	C	7	F	F	350	
106	2109	1026	TC	11	F	F	350	
107	2110	1026	TL	9	F+	F	350	
108	2117	1027	LC	8	M	F	351	
109	2119	1028	BL	9	F	M	352	
110	2126	1029	BR	8	F+	M	354	
111	2127	1029	BR	12	M+	M+	354	
112	2135	1030	TC	8	F	F	355	
113	2137	1030	BL	8	F	M	355	
114	2139	1031	LC	9	F	F	356	

FLIGHT 8 IO

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	190	641	TC	1	F	F	2109	
2	203	647	TC	1	F	F	2122	
3	268	647	RB	9	F+	M	2122	
4	278	649	TR	12	M	M	2126	
5	291	649	BL	10	F	M	2126	
6	373	656	BC	11	F+	M	2141	
7	402	658	RC	11	F	M	2145	
8	405	659	BL	11	F+	S+	2147	
9	430	701	LC	9	F	M	2151	
10	520	708	BC	4	F	F	2206	1
11	529	709	C	4	F	M	2208	2
12	603	715	TL	2	F	F	2221	5
13	647	719	TR	8	M	M	2230	6
14	662	721	RC	3	F	F	2234	7

NO	IND	UT	POS	DIR	BR	SP	LT	COR
15	707	725	C	4	M	F	2242	8
16	731	727	LC	12	B	M	2246	9
17	735	729	C	11	F	F	2251	10
18	769	731	BL	10	M	M	2255	13
19	780	732	TC	10	B	M	2257	15
20	784	733	C	4	F	F	2258	
21	923	747	LC	12	B	M	2329	20
22	1015	757	TC	2	F	F	2347	24
23	1028	758	TL	7	F+	S	2349	25
24	1031	759	C	3	B	M	2351	26
25	1034	759	TR	11	F+	F	2351	27
26	1057	802	C	3	F	F	2356	29
27	1084	805	TC	11	M	F	2	31
28	1096	806	BL	2	F+	F	4	32
29	1107	807	C	3	M	F	5	
30	1108	807	TC	11	B	F	5	
31	1117	808	TR	11	F	F	7	
32	1164	813	C	3	F	F	17	
33	1184	816	RC	2	F	M	23	
34	1190	816	TL	9	F	S	23	
35	1202	818	BL	8	M	M-	27	
36	1208	819	TL	12	F+	S	30	
37	1219	820	TL	1	VF	F	32	
38	1226	821	LC	11	F	F	34	
39	1243	823	BL	10	M	M	38	
40	1245	823	BL	9	M	M	38	
41	1257	824	BL	12	M	S	40	
42	1263	825	C	10	VB	M	42	
43	1277	827	TR	11	M	M	46	
44	1281	827	C	1	M	F	46	
45	1302	830	C	12	M	F	52	
46	1366	837	TC	11	F	F	106	
47	1369	838	C	4	F	S	109	
48	1375	839	TC	12	B	F	111	
49	1392	841	BL	7	M	M	115	
50	1396	841	TC	1	M+	F	115	
51	1453	849	L	11	M	F	131	
52	1458	849	TL	11	F	VF	131	
53	1467	851	TL	9	F+	S	135	
54	1478	852	RC	9	F+	F	137	
55	1489	853	LC	11	M	F	139	
56	1512	856	TL	1	M	F	145	
57	1533	859	TL	9	B	M	151	
58	1539	900	C	7	F	VF	153	
59	1555	902	BC	4	M	M	157	
60	1567	903	RC	9	F	M	159	
61	1570	903	LC	12	M	F	159	
62	1573	904	BC	11	F+	F	201	
63	1595	907	LC	1	F	F	208	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
64	1596	907	BR	4	F	S	208	
65	1603	908	BL	10	F	M	210	
66	1622	910	TL	9	M	M	214	
67	1636	912	BL	9	M	M+	218	
68	1679	918	BR	1	M+	F	230	
69	1691	921	C	4	F	S	236	34
70	1699	922	LC	5	F	S	238	36
71	1701	923	BC	10	F+	F	240	37
72	1706	923	C	11	F+	M	240	38
73	1708	924	BR	6	M	M	242	39
74	1710	924	BC	7	F	M	242	41
75	1720	926	C	8	B	M	246	43
76	1730	927	TC	4	F	M	247	
77	1734	927	LC	10	B	F	247	44
78	1749	929	C	10	F	M	249	
79	1753	930	TR	12	F+	M	250	46
80	1778	934	TC	12	M	M	254	48
81	1794	936	LC	11	F+	F	256	50
82	1826	940	LC	11	M	F	300	52
83	1827	940	BC	2	M	F	300	
84	1830	941	BL	9	F	M	301	
85	1831	941	BL	10	F	F	301	
86	1834	942	TC	2	B	F	302	53
87	1835	942	C	11	B	M	302	54
88	1838	942	C	10	M	M	302	55
89	1842	943	BC	3	M	F	303	56
90	1846	943	C	2	M	F	303	57
91	1869	947	TC	11	B	M	307	
92	1871	974	BL	4	B	F-	307	
93	1941	957	BC	4	F	F	317	
94	1981	1003	TL	1	F	F	323	58
95	1991	1005	C	3	F+	F	325	61
96	2002	1007	BL	1	B	F	327	63
97	2010	1008	BL	10	B	M	329	65
98	2017	1009	BR	2	F+	F	329	66
99	2018	1009	BL	1	M	F	329	67
100	2046	1014	RC	8	F	F	334	
101	2054	1014	LC	10	B	F	334	75
102	2058	1015	BR	2	B	F	335	77
103	2074	1018	C	2	M	F	339	85
104	2076	1018	BC	11	F	F	339	
105	2080	1018	BL	10	F+	F	339	89
106	2087	1019	LC	10	M	F	340	92
107	2089	1020	LC	10	F	S	342	93
108	2098	1021	BL	11	B	S	343	98
109	2110	1023	BL	7	F+	F	346	100
110	2119	1025	BC	7	M	F	349	102
111	2128	1026	C	7	F	F	350	105
112	2130	1026	TC	11	F	F	350	106

NO.	IND	UT	POS	DIR	BR	SP	LT	COR
113	2150	1029	BC	3	F	S	354	
114	2155	1030	C	8	F	F	355	112
115	2164	1032	BL	7	F	F	356	

FLIGHT 9 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	371	625	TC	10	F+	F	2258	
2	425	629	BR	5	F+	M	2258	
3	439	630	BR	4	B	S	2258	
4	468	633	BC	9	F	M	2258	
5	494	635	RC	7	M	F	2258	
6	522	637	BC	7	M	S	2258	
7	556	640	TR	2	M	M	2259	
8	651	649	TR	8	F+	M	2259	
9	655	649	LC	4	F	M	2259	
10	657	650	BR	11	M	M	2259	
11	669	651	RC	11	M	S+	2259	
12	690	653	BR	4	F+	F	2300	
13	731	657	C	11	M	S	2303	
14	749	658	LC	8	F	S	2306	
15	756	659	T	2	B	F	2308	

FLIGHT 9 IO

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	308	620	BC	8	B	F	2257	
2	315	620	RB	5	F+	M	2257	
3	440	630	B	4	B	S	2258	3
4	494	635	RC	7	F	F	2258	5
5	559	640	TC	2	F	M	2259	7
6	620	646	BC	6	M	F	2259	
7	631	647	C	8	F+	F	2259	
8	669	651	BR	11	F+	M	2259	11
9	756	659	TL	2	M	F	2308	15
10	795	703	TR	5	F+	F	2316	
11	918	716	TC	11	F	M	2343	
12	931	717	TC	10	F	S	2345	
13	935	718	TC	11	F	F	2347	
14	1361	806	TL	9	F+	M	123	
15	1369	807	LC	11	M+	M	125	
16	1387	809	BL	3	F+	M	129	
17	1422	814	TL	1	B	F	135	
18	1423	814	TC	12	F+	F	135	
19	1430	815	BR	11	F	M	137	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
20	1436	815	BR	5	F	M	137	
21	1458	818	BC	4	M	F	141	
22	1496	823	BL	1	F	F	147	
23	1503	824	TL	12	M	F	149	
24	1509	825	RC	1	F	F	151	
25	1518	826	TL	10	F	F	152	
26	1523	826	LC	10	F+	S	152	
27	1568	832	TC	1	B	M	202	
28	1596	836	TR	2	M	M	205	
29	1601	837	C	11	B	S	206	
30	1617	839	BR	11	B	M	208	
31	1629	840	TC	11	F+	S	209	
32	1654	844	LC	3	M	F	214	
33	1657	844	TR	1	M	F	214	
34	1661	1005	LC	11	M	M	403	
35	1662	1005	LC	2	F	F	403	
36	1668	1006	BC	3	B	S+	403	
37	1673	1006	B	3	M	M+	403	
38	1706	1011	BL	5	F	F	406	
39	1721	1013	BL	4	F	M	407	
40	1726	1014	LC	9	F+	S	408	

FLIGHT 10 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	11	923	LC	8	F	S	251	
2	33	924	TR	4	M	M+	251	
3	40	925	BC	3	B	F	252	
4	67	927	BC	6	M	S	253	
5	70	927	LC	11	F	F	253	
6	75	927	TR	4	M	F	253	
7	77	927	LC	3	F	F	253	
8	86	928	TR	11	M	F	254	
9	87	928	C	2	F	F	254	
10	111	930	RC	3	M	M+	255	
11	145	932	C	3	F	F	256	
12	153	933	LC	4	F		257	
13	166	934	RC	12	M	M	257	
14	176	934	TL	10	M	S+	257	
15	194	936	BR	3	B	F	259	
16	213	937	LC	2	F	F	259	
17	216	937	LC	1	F	F	259	
18	219	937	C	1	M	F	259	
19	220	938	C	6	F	M	300	
20	268	941	C	5	F	F	302	
21	288	943	RB	9	F	S	303	
22	300	944	BC	3	F	M+	304	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
23	301	944	LT	5	F	S	304	
24	301	944	LC	7	F	F	304	
25	310	945	RB	2	F	F-	304	
26	313	945	RB	11	F	F	304	
27	314	945	RB	6	F	F	304	
28	314	945	LC	2	F	F	304	
29	318	945	LC	8	F	M	304	
30	328	946	C	11	F	M	305	
31	330	946	RT	10	F	M	305	
32	334	947	RC	11	F	M	306	
33	334	947	C	10	M	M	306	
34	335	947	C	8	F	S	306	
35	347	948	BR	5	F	S	306	
36	348	948	BC	11	F	F+	306	
37	358	948	TC	12	M	M	306	
38	359	949	TR	3	F+	F	307	
39	387	951	LC	1	F	F	308	
40	387	951	LC	1	F+	F	308	
41	405	952	TC	6	F	M	309	
42	409	953	C	5	F	F	310	
43	434	955	BL	10	F	M	311	
44	436	955	BR	2	F	F	311	
45	440	955	TC	12	M	F	311	
46	453	956	R	12	M		311	
47	454	956	LC	1	F	M+	311	
48	455	957	RC	1	M	F	312	
49	489	959	RT	10	F	M	313	
50	491	1000	LC	2	F		314	
51	498	1000	TR	5	F	F	314	
52	512	1001	RC	2	F	F	315	
53	515	1002	BC	11	F	M	315	
54	522	1002	RC	2	F	F	315	
55	542	1004	TL	7	F	M	317	
56	545	1004	BL	4	F	F	317	
57	550	1005	BR	6	F	M	317	
58	562	1006	RC	12	F	F-	318	
59	563	1006	LC	10	F	M	318	
60	563	1006	RC	12	F	M	318	
61	567	1006	LC	7	F+	M	318	
62	570	1007	LB	11	F	F	319	
63	578	1007	TC	1	M	F	319	
64	586	1008	LB	10	F	M+	319	
65	592	1009	RB	5	F	F	320	
66	595	1009	LB	10	M	M	320	
67	598	1009	BC	5	F	M	320	
68	630	1012	TL	1	F	M	322	
69	633	1012	C	8	M	S	322	
70	633	1012	RC	11	F	F	322	
71	635	1013	TL	2	F+	M	322	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
72	639	1013	TL	1	F	F	322	
73	649	1014	TL	2	F	F	323	
74	649	1014	BL	2	F	F	323	
75	654	1014	LC	6	F	S	323	
76	657	1015	LB	2	F	F	324	
77	657	1015	C	1	F	F	324	
78	662	1015	TL	4	F	M+	324	
79	663	1015	B	3	B	M	324	
80	674	1016	RC	2	F	F	324	
81	688	1017	C	2	F	F	325	
82	700	1019	RC	2	F	F	326	
83	711	1020	BC	7	M+	S	327	
84	711	1020	LB	5	F	F	327	
85	719	1020	TC	2	F	F	327	
86	736	1022	TL	5	F	F	328	
87	737	1022	RC	2	F	F	329	
88	746	1023	RC	5	F	F	329	
89	747	1023	C	1	F+	S	329	
90	755	1024	C	12	F	F	329	
91	760	1024	C	2	F	M	329	
92	763	1025	RB	11	F+	M	330	
93	764	1025	C	3	F	F	330	
94	766	1025	TL	6	F	M	330	
95	776	1026	BL	11	F	F	331	
96	782	1027	BC	6	F	M	331	
97	783	1027	RB	11	F	F	331	
98	792	1028	C	2	F	F	332	
99	798	1028	C	1	F	F	332	
100	814	1030	TR	10	F	F	335	
101	830	1031	TL	10	F	M	337	
102	831	1031	BR	1	F		337	
103	845	1033	BR	8	F	M	340	
104	848	1033	BR	12	F	F	340	
105	858	1034	C	8	F	M	341	
106	862	1035	LB	12	F	F	343	
107	874	1036	RC	6	F		344	
108	884	1037	TL	12	F	F+	346	
109	901	1039	LC	12	F	F	349	
110	904	1039	LC	2	F	M	349	
111	908	1039	BC	6	M+	S+	349	
112	915	1040	BR	1	F+	F	350	
113	917	1040	TL	4	F	M	350	
114	929	1041	BL	10	F+	F	352	
115	930	1042	BL	8	F	F	353	
116	932	1042	TL	9	M	M	353	
117	933	1042	LC	1	F+	F	353	
118	933	1042	LC	9	F	M	353	
119	935	1042	LC	11	F+	F	353	
120	937	1042	RC	9	F	M	353	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
121	941	1043	CT	10	F	M	355	
122	942	1043	LC	11	F	F	355	
123	945	1043	LB	2	F+	F	355	
124	954	1044	TC	12	F+	F	356	
125	956	1044	C	1	F	F	356	
126	957	1044	RC	3	F	F	356	
127	959	1045	LC	1	VF	F	358	
128	969	1046	LC	2	F+	F	359	
129	973	1046	RC	3	F+		359	
130	974	1046	LC	8	F+	M	359	
131	980	1047	LB	5	B	M	401	
132	981	1047	LC	11	F	S	401	
133	984	1047	LC	8	F+	S	401	
134	991	1048	LB	10	F	F	402	
135	994	1048	RB	11	F+	F	402	
136	997	1049	LC	1	F+	F	404	
137	998	1049	C	10	F+	F	404	
138	1000	1049	LC	2	F	F	404	
139	1003	1049	RC	1	F	F	404	
140	1004	1049	BC	12	F	F	404	
141	1005	1050	LT	11	F	F	405	
142	1007	1050	LC	8	F+	M	405	
143	1011	1050	RC	4	F+	M	405	
144	1017	1051	RC	9	F	M	407	
145	1020	1051	TL	1	F	M	407	
146	1021	1051	BC	5	F	M	407	
147	1022	1051	TL	3	F	M	407	
148	1024	1052	BC	7	F	M	408	
149	1035	1053	BL	11	F	M	410	
150	1037	1053	C	2	F	F	410	
151	1038	1053	RT	12	F	F	410	
152	1050	1054	LC	11	M	F	411	
153	1052	1055	BC	4	F+	M	413	
154	1059	1055	BL	12	F	F	413	
155	1063	1056	BC	1	F	F	414	
156	1064	1056	TL	8	F+	M	414	
157	1065	1056	BR	10	F	M	414	
158	1078	1057	RC	1	F	F	416	
159	1082	1058	LC	11	M	F	417	
160	1082	1058	C	2	F	F	417	
161	1083	1058	BC	11	F+	F	417	
162	1084	1058	TR	9	F	M	417	
163	1086	1058	C	11	F	F	417	
164	1088	1059	LT	9	F	M	419	
165	1089	1059	RC	1	F	F	419	
166	1090	1059	RC	12	F	F	419	
167	1096	1059	C	11	F		419	
168	1101	1100	LB	1	F	F	420	
169	1102	1100	LC	7	M	M	420	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
170	1103	1100	LC	11	F	F	420	
171	1105	1100	TL	2	F	M	420	
172	1107	1101	LC	12	B	F	422	
173	1110	1101	BL	4	F	M	422	
174	1112	1101	TL	3	F	F	422	
175	1124	1103	LC	12	M+	F	425	
176	1130	1103	BC	9	F+	F	425	
177	1132	1104	BL	10	F		426	
178	1133	1104	TR	11	F		426	
179	1136	1104	LC	11	F	F	426	
180	1139	1104	BL	6			426	
181	1139	1104	BL	11	F		426	
182	1141	1105	BL	7			428	
183	1142	1105	TL	8	F	M	428	
184	1142	1105	RB	12	F	F	428	
185	1143	1105	RC	9	M	F	428	
186	1145	1105	LC	9	F	F	428	
187	1158	1106	RC	8	F+	F	430	
188	1162	1107	BC	2	F		432	
189	1168	1108	C	8			434	
190	1168	1108	LT	7	F	M	434	
191	1179	1109	BC	9			435	
192	1180	1109	TC	9	F		435	
193	1184	1109	BC	7			435	
194	1199	1111	RT	11	M-	S	438	
195	1201	1111	BR	7	VF		438	
196	1204	1112	RC	7	F+	F	439	
197	1205	1112	BL	5	F+	M	439	
198	1206	1112	BR	8	F		439	
199	1208	1112	TL	10	F	F	439	
200	1210	1112	BR	8	F	F	439	
201	1215	1113	TC	4	F	F	440	
202	1222	1114	TR	8	F		441	
203	1227	1114	LC	7	F+		441	
204	1227	1114	TC	5	F		441	
205	1230	1115	TC	12	F		442	
206	1236	1115	LC	8	F	F	442	
207	1238	1116	TC	7	F		443	
208	1240	1116	TC	9	F		443	
209	1241	1116	RC	7	F	F	443	
210	1242	1116	RC	3	F+	M	443	
211	1246	1117	BL	4	F	F	444	
212	1249	1117	TL	7	F		444	
213	1263	1119	LB	8	F		447	
214	1264	1119	LC	9	F		447	
215	1268	1119	BL	7	F		447	
216	1270	1119	C	7	F+		447	
217	1271	1120	RC	8	F	F	448	
218	1273	1120	TR	8	F		448	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
219	1275	1120	C	8	F		448	
220	1276	1120	C	1	F+		448	
221	1276	1120	C	7	F	VF	448	
222	1277	1120	C	9	F	F	448	
223	1278	1120	C	8	F		448	
224	1278	1120	BC	4	B		448	
225	1278	1120	C	3	F		448	
226	1279	1121	RC	4	F		449	
227	1279	1121	BC	7	F		449	
228	1280	1121	C	7	F		449	
229	1281	1121	LC	4	M	M	449	
230	1290	1122	BL	8	M		450	
231	1293	1122	BC	10	F+		450	
232	1297	1123	C	7	F	F	451	
233	1297	1123	LT	10	F+		451	
234	1297	1123	TC	7	F		451	
235	1298	1123	BC	7	F		451	
236	1301	1123	LB	7	F+	F	451	
237	1303	1123	LC	7	F	F	451	
238	1320	1125	TC	4	M	M	454	
239	1324	1126	C	9	F	F	455	
240	1327	1126	RC	6	F	F	455	
241	1331	1127	BL	10	F	F	456	
242	1332	1127	TL	2	F	VS	456	
243	1334	1127	RC	8	F	M	456	
244	1335	1127	TR	4	F+	F	456	
245	1339	1128	BR	6	F	F	457	
246	1343	1128	TL	10	F	F	457	
247	1345	1128	RC	1	F	F	457	
248	1346	1129	RC	7	B	M	458	
249	1348	1129	TR	1	F	F	458	
250	1348	1129	TL	9	F	F	458	
251	1353	1129	TL	1	M-	M	458	
252	1355	1130	C	8	F+	F	459	
253	1368	1131	BC	7	F+	F	500	
254	1374	1132	BL	8	M-	F	501	
255	1374	1132	BC	7	M	M	501	
256	1377	1132	BR	6	F	F	501	
257	1378	1132	C	4	F	M	501	
258	1380	1133	LB	8	M	M	503	
259	1385	1133	LB	11	F+	M	503	
260	1388	1134	TR	5	M	M	504	
261	1391	1134	LB	10	F	F	504	
262	1394	1134	TR	4	F	F	504	
263	1398	1135	BC	7	F	F	505	
264	1402	1135	C	2	F+	F	505	
265	1413	1137	RC	4	M+	M	507	
266	1413	1137	BL	7	M	F	507	
267	1417	1137	BL	11	F	S	507	

NO	IND	UT	POS	DIR	BR	SP	LT	COR
268	1420	1138	TL	11	F	F	508	
269	1421	1138	TL	8	F		508	
270	1425	1138	RC	5	F	F	508	
271	1429	1139	LC	5	F	F	509	
272	1435	1140	LC	4	F	F	510	
273	1437	1140	BR	3	B	S	510	
274	1438	1140	TR	6	F+	F	510	
275	1442	1140	BC	7	F+	F	510	
276	1445	1141	BR	7	F	F	512	
277	1446	1141	TR	7	B	F	512	
278	1448	1141	LC	8	F	F	512	
279	1449	1141	TR	7	M	M	512	
280	1452	1142	TR	0	M		513	
281	1452	1142	C	7	F	F	513	
282	1452	1142	BR	11	M		513	
283	1463	1143	C	10	F+	S	514	
284	1467	1144	BL	2	F		515	
285	1469	1144	TL	8	F	F	515	
286	1473	1144	LC	4	F	F	515	
287	1473	1144	LC	8	F	F	515	
288	1482	1145	LC	2	F	M	516	
289	1487	1146	BC	8	F	F	517	
290	1493	1147	BR	11	M	S	518	
291	1494	1147	LC	8	F	F	518	
292	1496	1147	C	10	F+	F	518	
293	1504	1148	BC	6	F	F	520	
294	1507	1149	TR	2	F	F	521	
295	1510	1149	BC	7	F+	M	521	
296	1515	1150	C	8	F	F	522	
297	1516	1150	BR	4	F	M	522	
298	1519	1150	BR	7	F	F	522	
299	1522	1151	BC	8	B	S	523	
300	1528	1151	LC	8	M	M	523	
301	1532	1152	TR	4	F	M	524	
302	1542	1153	BC	4	F+	M	526	
303	1546	1154	TR	5	M-	F	527	
304	1552	1154	C	7	M+	F	527	
305	1573	1157	TC	6	F+	F	532	
306	1579	1158	RC	3	M+	F	533	
307	1580	1158	BC	6	F	F	533	
308	1582	1158	TL	8	F	F	533	
309	1582	1158	LC	6	M	F	533	
310	1595	1200	LB	8	F	F	536	
311	1597	1200	BC	5	M-	F	536	
312	1599	1201	C	8	F	F	537	
313	1602	1201	C	8	F		537	
314	1606	1201	TR	8	M		537	

FLIGHT 10 10

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	30	821	BL	5	F+	M	214	
NO	IND	UT	POS	DIR	BR	SP	LT	COR
2	40	822	TL	8	F	M	215	
3	57	823	C	6	F	F	217	
4	79	824	TR	10	M	F	218	
5	88	825	TR	9	VF	F	219	
6	132	828	TC	11	F	F	223	
7	132	828	LC	8	F	F	223	
8	140	829	TC	8	M	M	224	
9	144	829	C	10	M	M	224	
10	147	829	BL	6	M+	M-	224	
11	183	832	BC	10	F+	M	228	
12	208	834	C	4	F+	S	231	
13	225	835	TR	4	F	S	232	
14	298	841	BR	7	B-	F	239	
15	308	842	BR	11	B	F	241	
16	388	850	C	2	M	F	246	
17	399	851	BC	3	F	M	246	
18	449	855	LC	9	M	M	245	
19	454	856	BR	2	F	M	245	
20	455	856	TL	5	F	F+	245	
21	480	858	BR	9	M	S	245	
22	491	859	BL	8	B	F	245	
23	507	900	C	7	M	F	245	
24	539	904	RC	2	F+	F	244	
25	569	907	C	3	F	M	244	
26	574	907	LC	2	B	M	244	
27	592	909	TL	5	F+	F	244	
28	603	910	TL	9	F+	M	244	
29	622	912	C	5	F+	S+	244	
30	706	920	RC	7	B	S	249	
31	707	920	TC	3	F+	F	249	
32	720	921	C	9	M	S	249	
33	739	923	LT	5	F	F	251	
34	739	923	LT	8	F	S	251	1
35	754	924	TC	4	F+	M+	251	2
36	759	925	BL	3	B	F	252	3
37	762	925	BR	4	B	S	252	
38	780	927	TL	11	F	F	253	5
39	783	927	TR	4	F+	F	253	6
40	791	928	TR	11	M	F	254	8
41	792	928	LC	2	M	F	254	9
42	808	929	RC	3	B	M+	255	10
43	833	932	RC	3	F	F	256	11
44	848	934	RC	12	M	M	257	13
45	856	934	TL	10	M	S+	257	14
46	868	936	RC	3	B	F	259	15

47	885	937	LC	2	M	F	259	16
48	889	938	LC	6	M	F	300	19
49	937	943	BR	9	F+	VS	303	21
50	946	944	RC	3	F	F	304	22
NO	IND	UT	POS	DIR	BR	SP	LT	COR
51	955	945	BC	11	F+	F	304	26
52	956	945	BC	6	M+	M	304	27
53	966	946	C	11	M	F	305	30
54	970	946	RC	11	F	M	305	32
55	971	946	C	10	M	S	305	33
56	980	947	BR	5	M	M	306	35
57	981	947	BL	11	F+	M	306	36
58	989	948	TC	12	VB	F	306	37
59	990	948	TR	3	M	M	306	38
60	1011	951	LC	1	F+	F	308	39
61	1011	951	LC	1	F+	F	308	40
62	1024	952	LC	6	F	M	309	41
63	1047	955	BL	10	F+	S	311	43
64	1051	955	TC	7	F	F	311	
65	1063	956	RC	1	M	M	311	48
66	1089	959	TR	10	F	M	313	49
67	1096	1000	TR	5	VF	F	314	51
68	1114	1002	BC	2	F	F	315	54
69	1130	1004	TL	7	M+	S	317	55
70	1134	1004	BR	6	F	M	317	57
71	1146	1006	BR	12	B	S	318	60
72	1149	1006	LC	7	F+	M	318	61
73	1158	1007	LT	1	F	F	319	63
74	1169	1008	BR	5	F	F	320	65
75	1201	1012	C	8	B	M-	322	69
76	1201	1012	BC	11	F	F	322	70
77	1202	1012	LT	2	F+	F	322	71.
78	1214	1013	LT	1	F	F	322	72
79	1217	1014	TL	6	F	S	323	75
80	1220	1014	LC	2	F	F	324	76
81	1228	1015	B	3	B	F	324	79
82	1245	1017	TC	2	F	F	325	81
83	1264	1020	BC	7	B	S	327	83
84	1270	1020	TL	2	F	M	327	85
85	1285	1022	RC	2	M	F	329	87
86	1292	1023	TR	5	F	F	329	88
87	1292	1023	LC	1	B	F	329	89
88	1298	1024	LC	12	F	F	329	90
89	1303	1024	C	2	F	F	329	91
90	1306	1025	C	11	B	M	330	92
91	1306	1025	LC	3	M	F	330	93
92	1308	1025	TL	6	F	S	330	94
93	1320	1026	C	2	F	F	331	
94	1321	1026	BL	7	F	F	331	
95	1329	1028	RC	2	F	F	332	98

96	1347	1030	RC	10	F	F	335	100
97	1372	1033	BR	8	F	M	337	103
98	1374	1033	BR	12	M	M+	340	104
99	1382	1034	C	8	B	M-	341	105

NO	IND	UT	POS	DIR	BR	SP	LT	COR
100	1385	1035	BL	12	F	F	343	106
101	1423	1039	BL	6	F+	S	349	111
102	1428	1040	BR	1	M	F	350	112
103	1440	1041	BL	10	B	F	352	114
104	1444	1042	C	9	F+	F	353	118
105	1461	1044	TC	12	B	F	356	124
106	1462	1044	C	1	F	F	356	125
107	1477	1046	C	8	M	M	359	130
108	1482	1047	LC	5	B	M	401	131
109	1494	1048	C	11	B	F	402	135
110	1497	1049	TL	10	F+	F	404	137
111	1504	1050	LC	8	B	M	405	142
112	1507	1050	RC	4	B	M+	405	143
113	1513	1051	C	9	M	M	407	144
114	1516	1051	BL	5	M	S+	407	146
115	1530	1053	TR	2	F	F	410	150
116	1541	1054	LC	11	F	M	411	152
117	1542	1055	BL	4	M	M	413	153
118	1551	1056	BL	1	M	F	414	155
119	1552	1056	TL	8	F	M+	414	156
120	1553	1056	BR	10	F+	S	414	157
121	1567	1058	LC	11	F+	F	417	159
122	1569	1058	BL	9	M+	M	417	
123	1573	1058	RC	1	F+	F	417	165
124	1583	1100	TL	7	M	M	420	169
125	1588	1101	TL	1	B	F	422	
126	1592	1101	TL	3	F	F	422	174
127	1601	1103	LC	12	F+	F	425	175
128	1607	1103	BC	9	M	F	425	176
129	1609	1104	BC	11	F+	F	428	179
130	1617	1105	TL	8	F	M	428	183
131	1617	1105	BC	12	M	F	428	184
132	1618	1105	TR	9	F	F	428	185
133	1631	1106	TC	8	M	F	430	187
134	1639	1108	TL	7	F+	M	434	190
135	1665	1111	TR	11	F+	S	438	194
136	1670	1112	RC	7	F	F	439	196
137	1670	1112	BL	5	B	M	439	197
138	1684	1114	C	7	F	F	441	203
139	1687	1114	BC	10	F+	S	441	
140	1690	1115	LC	8	F	F	442	206
141	1702	1116	RC	3	F	F	443	210
142	1726	1119	C	7	F	F	448	216
143	1727	1120	C	8	F	F	448	217
144	1731	1120	C	1	F	F	448	220

145	1733	1120	BL	4	B	S	448	224
146	1733	1120	LC	3	F	F	448	225
147	1739	1121	LC	4	F	F	449	229
148	1739	1121	C	7	F	M	449	228
NO	IND	UT	POS	DIR	BR	SP	LT	COR
149	1743	1122	BL	8	F+	F	450	230
150	1746	1122	BC	10	M	M	451	233
151	1753	1123	BL	7	F+	F	451	236
152	1753	1123	BL	7	F	F	451	237
153	1771	1126	C	9	F	F	455	239
154	1778	1127	LC	10	VF	F	456	241
155	1780	1127	RC	8	F	M	456	243
156	1781	1127	TR	4	F	F	456	244
157	1790	1128	RC	6	B	M+	457	245
158	1798	1129	C	7	F+	F	458	248
159	1809	1131	BL	7	F+	F	500	253
160	1814	1132	LC	7	F	F	501	255
161	1815	1132	C	8	B	F	501	
162	1818	1132	RC	4	F	M	501	257
163	1820	1133	BL	8	M+	F	503	258
164	1824	1133	BL	11	F+	M	503	259
165	1827	1134	TR	5	F	F	504	260
166	1829	1134	BC	10	F	F	504	261
167	1838	1135	LC	2	M	M	505	264
168	1841	1136	BC	8	F	F	506	
169	1848	1137	LC	7	M	F	507	265
170	1848	1137	RC	4	B	F	507	266
171	1851	1137	LC	11	F	M	507	267
172	1867	1139	LC	5	F	F	510	271
173	1869	1140	BR	3	B	M	510	273
174	1870	1140	TC	6	F	M	510	274
175	1873	1140	BC	7	B	F	510	275
176	1876	1141	TL	8	B	F	512	278
177	1879	1141	TR	7	B	F	512	279
178	1882	1142	C	11	B	M	513	282
179	1891	1143	C	10	B	M	514	283
180	1905	1145	BC	8	F+	F	517	289
181	1910	1147	RB	11	B	S	518	290
182	1914	1147	C	10	M	F	518	292
183	1921	1148	BL	6	M	F	520	293
184	1923	1149	C	2	F	M	521	294
185	1925	1149	BC	7	M	F	521	295
186	1930	1150	RC	8	F	F	522	296
187	1931	1150	BR	4	F	F	522	297
188	1936	1151	BC	8	B	M	523	299
189	1941	1151	LC	8	M	F	523	300
190	1953	1153	BC	4	F	F	526	302
191	1957	1154	RC	5	F+	F	527	303
192	1962	1154	LT	7	M	F	527	304
193	1986	1158	RC	3	B	M	533	306

194	1988	1158	LC	6	M	F	533	309
195	2001	1200	BC	5	F	F	536	311

FLIGHT 11 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	127	1945	BR	1	F+	F	1604	
NO	IND	UT	POS	DIR	BR	SP	LT	COR
2	181	1950	LC	1	F+	M	1616	
3	193	1951	C	1	M	M	1618	
4	208	1952	LC	3	F	M	1620	
5	353	2002	LC	1	VB	S+	1647	
6	358	2003	C	7	F	M	1647	
7	365	2004	LB	4	F	F	1650	
8	387	2006	C	11	F	VF	1655	
9	387	2006	RC	11	M	M	1655	
10	412	2008	C	7	F	F	1700	
11	414	2009	LC	1	F+	F	1700	
12	416	2009	LC	3	F	S	1700	
13	1515	2205	LC	10	F	F	2203	
14	1515	2205	TL	8	F	F	2203	
15	1516	2205	TC	10	F+	F	2203	
16	1516	2205	TL	5	F	M	2203	
17	1549	2209	RC	6	B	S	2210	
18	1551	2209	BR	12	F+	F	2210	
19	1564	2211	TR	4	F	F	2214	
20	1567	2211	TC	12	F	F	2214	
21	1569	2212	BL	4	M	F	2216	
22	1585	2214	C	6	M+	S	2220	
23	1642	2221	RC	1	M	M	2236	
24	1642	2221	BR	4	M	M	2236	
25	1644	2222	LC	12	F	M	2239	

FLIGHT 12 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	801	810	RC	1	VB	F	742	
2	804	811	BC	4	F	F	740	
3	819	812	TL	1	F	F	739	
4	833	814	RB	6	M	M	737	
5	854	816	BL	2	B	S	735	
6	857	816	RC	12	F+	F	735	
7	875	818	TL	1	M+	M	733	
8	877	818	TL	4	B	F	733	
9	879	818	TC	8	F	M	733	
10	887	819	TC	1	M	F	732	

11	908	821	TL	2	F	F	730	
12	918	822	BR	2	F	F	729	
13	921	823	BL	3	F+	F	728	
14	929	823	TL	3	F+	M	728	
15	952	826	TR	4	B	F	725	
16	954	826	LC	12	F	F	725	
17	954	826	BL	4	F	M+	725	
18	955	826	BC	1	B	M	725	
19	965	827	LC	12	F	F	724	
NO	IND	UT	POS	DIR	BR	SP	LT	COR
20	970	828	T	2	B	M+	723	
21	973	828	LC	7	F	M	723	
22	973	828	C	3	F	M	723	
23	976	828	TC	1	B	F	723	
24	977	829	BR	7	F	S	722	

FLIGHT 13 SEC

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	8	606	LC	5	B	F	637	
2	9	606	RC	4	M+	F	637	
3	17	606	LC	8	F	M	637	
4	24	607	C	4	F	F	637	
5	27	607	TC	5	B	F	637	
6	66	609	C	5	F	F	636	
7	85	611	RC	4	VF	VF	636	
8	96	612	TL	9	F+	S+	635	
9	115	613	BR	4	F+	M	635	
10	117	613	C	5	M+	F	635	
11	121	613	L	5	M	F	635	
12	121	613	BC	10	F	S	635	
13	127	614	RC	6	S	S	635	
14	145	615	RC	5	M	M	635	
15	181	618	BC	5	M	F	634	
16	188	618	TL	4	B	F	634	
17	198	619	TL	8	F+	S	634	
18	202	619	TL	4	M+	M	634	
19	233	622	C	8	F	M	633	
20	237	622	LC	2	M+	S	633	
21	258	624	TL	5	F+	F	632	
22	262	624	LC	2	F	F	632	
23	284	626	RC	4	F	M+	632	

FLIGHT 13 IO

NO	IND	UT	POS	DIR	BR	SP	LT	COR
1	384	633	C	5	F+	F	630	

2	443	630	TL	7	M	M	629	
3	452	633	BR	2	M	F	629	
4	475	640	C	2	F+	F	628	
5	492	642	BL	4	M	F	628	
6	581	650	TR	1	M	M	626	
7	601	652	TC	1	B	M	624	
8	639	655	LC	10	F	M	622	
9	654	657	RR	11	B	M	620	
NO	IND	UT	POS	DIR	BR	SP	LT	COR
10	674	659	C	5	F	T	619	
11	714	702	RC	7	F	F	613	
12	717	703	BC	9	F	M	614	
13	738	705	C	6	F	F	613	
14	741	705	TL	1	F	M	613	
15	751	706	C	10	F	S	612	
16	756	706	C	9	F	S	612	
17	763	707	LC	1	M	M	611	
18	797	710	TL	7	M	T	608	
19	813	712	BL	7	F	F	606	
20	859	717	RC	6	F	F	602	
21	919	723	TL	3	F	F	556	
22	962	727	RC	10	T+	S	553	
23	1108	743	C	1	M	F	531	
24	1118	744	C	5	F	F	530	
25	1122	745	C	1	F	T	528	
26	1183	752	RC	5	B	M	518	
27	1190	753	LC	1	F	S	517	
28	1196	753	RC	5	M	F	517	
29	1200	754	BC	12	F	T	515	
30	1218	756	BR	4	M	T	514	
31	1262	801	TL	11	F	M	531	
32	1282	804	BC	8	F	T	544	
33	1296	805	TL	7	M	M	547	
34	1304	806	TL	12	F	S	551	
35	1378	815	LC	11	F+	F	620	
36	1381	816	TL	3	F	F	624	
37	1425	821	C	6	M	M	645	
38	1436	822	TC	2	M	S	649	
39	1471	827	TL	6	F	F	710	
40	1479	828	RC	8	F	F	714	

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NASA-Langley, 1971 — 30 M438

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