



#277

ALOUETTE 2

ORIG REDUCED DATA 65-098A-04A

7 TAPES

BOUNDARY DATA 65-098A-04B

1 TAPE

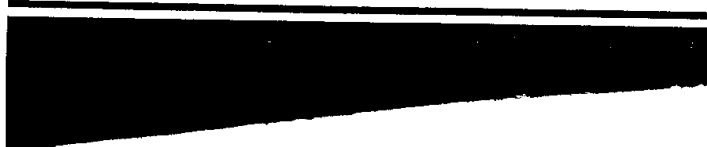


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1. INTRODUCTION:

The documentation for this data set was originally on paper, kept in NSSDC's Data Set Catalogs (DSCs). The paper documentation in the Data Set Catalogs have been made into digital images, and then collected into a single PDF file for each Data Set Catalog. The inventory information in these DSCs is current as of July 1, 2004. This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system. The information existing in the DSCs is now not needed for locating the data files, but we did not remove that inventory information.

The offline tape datasets have now been migrated from the original magnetic tape to Archival Information Packages (AIP's).

A prior restoration may have been done on data sets, if a requestor of this data set has questions; they should send an inquiry to the request office to see if additional information exists.

2. ERRATA/CHANGE LOG:

NOTE: Changes are made in a text box, and will show up that way when displayed on screen with a PDF reader.

When printing, special settings may be required to make the text box appear on the printed output.

Version	Date	Person	Page	Description of Change
01				
02				

3 LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC
INFORMATION SYSTEM:

<http://nssdc.gsfc.nasa.gov/nmc/>

[NOTE: This link will take you to the main page of the NSSDC Master Catalog. There you will be able to perform searches to find additional information]

4. CATALOG MATERIALS:

- a. Associated Documents To find associated documents you will need to know the document ID number and then click here.
<http://nssdcftp.gsfc.nasa.gov/miscellaneous/documents/>

- b. Core Catalog Materials

ALQUETTE 2

COUNT RATE DATA

65-098A-04A SPMS-00644

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY SEVEN 7-TRACK, 800 BPI TAPES. WRITTEN IN BINARY. THERE ARE TWO RESTORED TAPES. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR02782	DS02782	D13529	1	12/02/65 - 02/08/66
		D13528	2	02/08/66 - 05/18/66
		D13530	3	05/17/66 - 06/29/66
DR02783	DS02783	D14472	1	06/28/66 - 08/18/66
		D14473	2	08/18/66 - 12/12/66
		D14475	3	12/12/66 - 04/15/67
		D14474	4	04/02/67 - 11/08/67

ALOUETTE 2

65-098A-04A

ORIG REDUCED DATA

This data set consists of 7 Alouette 2 Orig Reduced data tapes.
These tapes were created on an IBM 360 at 800 BPI, binary, 9 track,
1 file. Blocks contain 50 card image records.

The time spans for the tapes are:

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>	<u>ORBITS</u>
D-13529	C-12110	12/02/65 - 2/08/66	34- 843
D-13528	C-12109	2/08/66 - 5/18/66	851-2016
D-13530	C-12111	5/17/66 - 6/29/66	2004-2518
D-14472	C-12112	6/28/66 - 8/18/66	2506-3110
D-14473	C-12113	8/18/66 - 12/12/66	3104-4491
D-14475	C-12115	12/12/66 - 4/15/67	4486-5957
D-14474	C-12114	4/02/67 - 11/08/67	5801-8409

ANALYSIS II 'CONDENSED' TAPES

1. DATA ARE IN CHRONOLOGICAL ORDER AND INCLUDE ONLY THOSE TIMES WHEN THE INVARIANT LATITUDE $\geq 50^\circ$ ($\Delta t = 4 \text{ sec}$)
2. a) TAPES ARE 9-TRACK, 800 b.p.i.
 b) RECORDS ARE 80 BYTES LONG; BLOCKS CONTAIN 50 RECORD
 (LRECL=80, BLKSIZE=4000, RECFM=FB)
 c) ALL RECORDS ARE ON ONE FILE
 d) ALL RECORDS WERE WRITTEN UNDER FORMAT 20A4
3. EACH RECORD CONTAINS 20 WORDS AS FOLLOWS:

1. STATION-ORBIT	SPPPPP	I*4	Like in Section 1
2. YEAR		I*4	
3. DAY		I*4	
4. HOUR		I*4	
5. MINUTE		I*4	
6. SECOND		I*4	
7. Kp		I*4	
8. ALTITUDE (km)		R*4	
9. MAGNETIC FIELD B (gauss)		R*4	
10. INVARIANT LATITUDE		R*4	
11. LOCAL MAGNETIC TIME		R*4	
12. ANGLE BETWEEN SPIN AXIS AND FIELD		R*4	
13. PITCH ANGLE OF "223 PERP" COUNTER		R*4	
14. PITCH ANGLE OF "223 PARALLEL" COUNTER		R*4	
15. "223 PERPENDICULAR" COUNTER		R*4	
16. SILICON JUNCTION "		R*4	
17. "223 PARALLEL" "		R*4	
18. 302 COUNTER		R*4	
19. "223 WITH FIELD" COUNTER		R*4	
20. "Telescope"		R*4	

kilometers, inclination 79.8° prograde, and period 121.4 minutes. The satellite orbit plane precesses at about 2° per day with respect to the earth-sun line, so that in a three-month period data are obtained at all local times.

The charged particle experiment on the satellite, which is similar to an experiment on Alouette I, consists of seven different particle detectors. The geometric factors and energy thresholds of five of the detectors are listed in Table I. Only detectors 1 and 4 have been used in the present study. Detector 1 is a thin-window ($\sim 1 \text{ mg/cm}^2$) Geiger counter mounted behind a brass collimator whose axis is inclined 90° to the satellite spin axis. Detector 4 is an Eon 7302 Geiger counter whose wall thickness plus shielding is 1.4 g/cm^2 over approximately 2.4 steradians and much greater over the remaining solid angle.

The satellite is spin stabilized and has a spin period of 26.7 seconds; magnetic aspect is obtained from a three-component magnetometer on board. During each spin period, detector 1 samples a range of pitch angles of $90 \pm \theta$ degrees, where θ is the angle between the spin axis and the magnetic-field direction, θ being a slowly varying function of latitude and time (because the spin axis precesses). The boundary measurements reported here for 35-keV and 3.9-MeV electrons refer to local pitch angles close to 90° .

For this study, passes recorded by telemetry stations in England, Canada, and Alaska were

used. Data from the telemetry tapes are first transferred to digital magnetic tapes and these are merged with world map tapes supplied by NASA in an IBM 360 computer. The computer then calculates for each second of the pass corrected counting rates, the angles between the magnetic field direction, and the counter collimator axes, local magnetic time and obtains by interpolation from the world map tape the various positional coordinates (B , L , Λ , etc.). The computer output is stored on magnetic tape and for each pass the counting rates of all the detectors, along with pitch angles and magnetic coordinates, are plotted on an EAI 3500 Data Plotter.

Results

To study the dependence of various features of the radiation zone on magnetic local time the following four high-latitude boundaries were defined: Λ_b , the 35-keV "background" boundary, is determined by the invariant latitude where the counting rate in the 35-keV electron detector falls to the cosmic-ray background level; Λ_s , the 35-keV "smooth" boundary, is determined by the latitude where the 35-keV electron profile shows a marked change in character—this may be a sudden change in slope, a rapid change in intensity, or the onset of rapid intensity variations; Λ_i , the 35-keV "sharp" boundary, is determined by the latitude where the 35-keV profile decreases in intensity by more than a factor of 10 in a latitude interval of less than

TABLE I
Alouette II detector parameters

Detector number	1	2	3	4	5
Detector type	Thin-window Geiger	Thin-window Geiger	Thin-window Geiger	Thick-wall Geiger	Solid state
Directional properties					
Angle from spin axis	90°	10°	0°	—	10°
Half-angle of view	5.2°	4.5°	13°	—	19°
Geometric factor ($\text{cm}^2 \text{ sr}$)	5.6×10^{-3}	5.1×10^{-4}	1.9×10^{-2}	—	6.8×10^{-2}
Particle response (50% transmission)	$\begin{cases} e^- > 35 \text{ keV} \\ p^+ > 0.5 \text{ MeV} \end{cases}$	$\begin{cases} > 43 \text{ keV} \\ > 0.5 \text{ MeV} \end{cases}$	$\begin{cases} > 250 \text{ keV} \\ > 0.5 \text{ MeV} \end{cases}$	—	$1.3\text{--}7 \text{ MeV}$
Directional properties					
Geometric factor (cm^2)	0.75	0.20	0.20	0.75	
Particle response (50% transmission)	$\begin{cases} e^- > 3.9 \text{ MeV} \\ p^+ > 33 \text{ MeV} \end{cases}$	$\begin{cases} > 3.9 \text{ MeV} \\ > 33 \text{ MeV} \end{cases}$	$\begin{cases} > 3.9 \text{ MeV} \\ > 33 \text{ MeV} \end{cases}$	$\begin{cases} > 3.9 \text{ MeV} \\ > 33 \text{ MeV} \end{cases}$	
Minimum shielding for effective solid angle	$\sim 3.1 \text{ g/cm}^2$ $\sim 4.0 \text{ sr}$	$\sim 1.4 \text{ g/cm}^2$ $\sim 2.0 \text{ sr}$	$\sim 1.4 \text{ g/cm}^2$ $\sim 0.4 \text{ sr}$	$\sim 1.4 \text{ g/cm}^2$ $\sim 2.4 \text{ sr}$	

223 L

223 II

223 flr

302

Silicon 14

(FILES,MODE,DENSITY,TAPE DESCRIPTION)
1 BIN 800

*** READ ERROR ON RECORD 2 OF FILE 1

FILE NO. 1
3838 RECORDS 1 READ ERRORS
2372.2 FEET OF TAPE

D-13529

*** NO. OF FILES CHECKED = 1 NO. OF FEET OF TAPE = 2372.2
TOTAL NO. OF PHYSICAL RECORDS = 3838
TOTAL NO. OF READ ERRORS = 1

D-13529
C-12110
Orlando 34-843
12/02/65 - 02/08/66

RECORD 3836 OF FILE 1
LENGTH = 4000 BYTES

00049728	00000042	00000027	00000006	00000036	00000002	00000021	43AF5000	402EE66E	423DAF5B
411785C9	42358EBD	426C8648	4228FB25	434BF67C	412ABF5C	42220000	426428B5	00000000	4023D70A
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411788CE	42358131	42622977	4228B3E4	43664AE7	412BAE1A	422C5C28	425D5E88	00000000	40266666
00049728	00000042	00000027	00000006	00000036	00000004	00000021	43AF4000	402EF080	423D8D6F
411788D3	4235A3A7	42575A88	422C0FED	4368C670	4124F5C2	421FFD70	4245547A	00000000	4023D70A
00049728	00000042	00000027	00000006	00000036	00000005	00000021	43AF3800	402EF589	423D8479
41178ED7	423561D0	424C8381	422D0618	4366DE83	411AB851	4225A147	4242A8F5	00000000	4023D70A
00049728	00000042	00000027	00000006	00000036	00000006	00000021	43AF3000	402EFA93	423D8B83
411791DC	42358896	4241DE00	422E80C2	434AA7DE	411AB851	422A91E8	42401999	00000000	403AE147
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411794E1	4235780E	4237850C	423061AB	434D4F21	40CF5C28	4231D1E8	423A0000	00000000	40E8851E
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4117A0F4	42354502	42221D68	4239355A	42700000	40B5C28F	42399999	423E0000	00000000	402E147A
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4117A3F9	42353783	42260B70	42382036	42880000	40BAE147	42599999	42400000	00000000	40333333
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4117A6FE	42352A05	422D213A	423CB9ED	4324D793	40AE147A	42599999	4255547A	00000000	402E147A
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4117AA03	42351C87	423618D5	423DEFF0	433EC3C0	40AE147A	42466666	42400000	00000000	402E147A
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4117AD08	42350F0E	42401839	423EB475	4366DE83	40AE147A	4245547A	42609C28	00000000	40A147AE
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4117B616	4234E6A2	4260147F	423E1AA1	43990481	41147AE1	4255547A	426347AE	00000000	40570A3D
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4117C229	4234B0D2	4284F73B	423753AE	43274773	411947AE	424D547A	425F3851	00000000	404CCCCC
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4117C52E	4234A362	4289F8F3	4234FE0C	431CAA36	40BAE147	4242A8F5	425E63D7	00000000	404CCCCC
00049728	00000042	00000027	00000006	00000036	00000018	00000021	43AEA800	402F5535	423E4A36
4117C833	423495F4	428B93FE	42329AD6	42660000	40BAE147	42400000	42400000	00000000	412147A
00049728	00000042	00000027	00000006	00000036	00000019	00000021	43AE9800	402F5A3E	423E5146
4117CB37	42348885	4289646C	42304A43	431AD943	40BAE147	4244CCCC	42529E88	00000000	406147AE
00049728	00000042	00000027	00000006	00000036	0000001A	00000021	43AE9800	402F5F47	423E5951
4117CE3C	42347B18	4283F1FC	422E2EDF	424C0000	40BAE147	423D0C28	42507333	00000000	406147AE
00049728	00000042	00000027	00000006	00000036	0000001B	00000021	43AE0800	402F6450	423E5F5B
4117D141	42346DAE	427C3751	422C68E8	4351682A	40BAE147	4233547A	424CCCCC	00000000	4070A3D7
00049728	00000042	00000027	00000006	00000036	0000001C	00000021	43AE0800	402F695A	423E6665
4117D446	42346045	42730FD8	422B222E	43760381	41199999	42320000	424823D7	00000000	407AE147
00049728	00000042	00000027	00000006	00000036	0000001D	00000021	43AE7800	402F6E62	423E686F
4117D7AB	423452DC	42691143	422A68DD	43A13810	4120CCCC	42380000	424980A3	00000000	412028F5
00049728	00000042	00000027	00000006	00000036	0000001E	00000021	43AE7800	402F7000	407E7000

00004728	00004729	00004730	00004731	00004732	00004733	00004734	00004735	00004736	00004737	00004738	00004739	00004740	00004741	00004742	00004743	00004744	00004745	00004746	00004747	00004748	00004749	00004750	00004751	00004752	00004753	00004754	00004755	00004756	00004757	00004758	00004759	00004760	00004761	00004762	00004763	00004764	00004765	00004766	00004767	00004768	00004769	00004770	00004771	00004772	00004773	00004774	00004775	00004776	00004777	00004778	00004779	00004780	00004781	00004782	00004783	00004784	00004785	00004786	00004787	00004788	00004789	00004790	00004791	00004792	00004793	00004794	00004795	00004796	00004797	00004798	00004799	00004800	00004801	00004802	00004803	00004804	00004805	00004806	00004807	00004808	00004809	00004810	00004811	00004812	00004813	00004814	00004815	00004816	00004817	00004818	00004819	00004820	00004821	00004822	00004823	00004824	00004825	00004826	00004827	00004828	00004829	00004830	00004831	00004832	00004833	00004834	00004835	00004836	00004837	00004838	00004839	00004840	00004841	00004842	00004843	00004844	00004845	00004846	00004847	00004848	00004849	00004850	00004851	00004852	00004853	00004854	00004855	00004856	00004857	00004858	00004859	00004860	00004861	00004862	00004863	00004864	00004865	00004866	00004867	00004868	00004869	00004870	00004871	00004872	00004873	00004874	00004875	00004876	00004877	00004878	00004879	00004880	00004881	00004882	00004883	00004884	00004885	00004886	00004887	00004888	00004889	00004890	00004891	00004892	00004893	00004894	00004895	00004896	00004897	00004898	00004899	00004900	00004901	00004902	00004903	00004904	00004905	00004906	00004907	00004908	00004909	00004910	00004911	00004912	00004913	00004914	00004915	00004916	00004917	00004918	00004919	00004920	00004921	00004922	00004923	00004924	00004925	00004926	00004927	00004928	00004929	00004930	00004931	00004932	00004933	00004934	00004935	00004936	00004937	00004938	00004939	00004940	00004941	00004942	00004943	00004944	00004945	00004946	00004947	00004948	00004949	00004950	00004951	00004952	00004953	00004954	00004955	00004956	00004957	00004958	00004959	00004960	00004961	00004962	00004963	00004964	00004965	00004966	00004967	00004968	00004969	00004970	00004971	00004972	00004973	00004974	00004975	00004976	00004977	00004978	00004979	00004980	00004981	00004982	00004983	00004984	00004985	00004986	00004987	00004988	00004989	00004990	00004991	00004992	00004993	00004994	00004995	00004996	00004997	00004998	00004999	00005000	00005001	00005002	00005003	00005004	00005005	00005006	00005007	00005008	00005009	00005010	00005011	00005012	00005013	00005014	00005015	00005016	00005017	00005018	00005019	00005020	00005021	00005022	00005023	00005024	00005025	00005026	00005027	00005028	00005029	00005030	00005031	00005032	00005033	00005034	00005035	00005036	00005037	00005038	00005039	00005040	00005041	00005042
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ALOUETTE 2

PARTICLE BOUNDARY DATA

65-098A-04B

SPMS-00260

THIS DATA SET HAS BEEN RESTORED. THE ORIGINAL TAPE WAS 9-TRACK, 800 BPI, EBCDIC AND THE RESTORED TAPE IS 9-TRACK, 6250 BPI. THE TAPE WAS CREATED ON AN IBM 360 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBER AND THE TIME SPAN ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR02795	DS02795	D13531	1	11/29/65 - 06/18/69

ALOUETTE 2

65-098A-04B

BOUNDARY DATA

This data set consists of 1 Alouette 2 Boundary data tape
created on an IBM 360 at 800 BPI, EBCDIC, 9 track, 1 file.

The time span for the tape is:

<u>D#</u>	<u>C#</u>	<u>TIME SPAN</u>
D-13531	C-12116	11/29/65 - 6/18/69

Alouette II Boundary Listings

1. Column 1 Station Code number

- 1 Resolute
 - 2 Winkfield
 - 3 Ottawa
 - 5 College, Alaska
 - 6 Ororal, Australia
 - 7 Tromso, Norway
 - 9 University of Alaska

2. Column 7 'X' specifies an ascending (pole-ward)
 pass
Column 8 'X' specifies a decending (equator-ward)
 pass

The direction is determined at the beginning of a pass only i.e., if the satellite crossed either the north or south poles during a pass, the direction would be specified as "ascending".

3. Column 11 "Phi" is the magnetic solar co-declination
 measured in the direction away from
 the sun.

4. a) The "Boundaries" heading applies to all entries from
 "40 B'grd" to "1-8 MeV".

b) The "40 B'grd" boundary is defined as the point where the intensity of the 40 keV electrons reaches the cosmic ray background intensity; the invariant latitude and local magnetic time of this point are listed.

c) The "40SB" boundary describes the point at which a special type of discontinuity occurred in the 40 keV electron counting rate and its invariant latitude was recorded for a few of the earlier Alouette II passes. However, we later discontinued the practice of recording it.

d) For the 40 keV "smooth" boundary, the invariant latitude, local magnetic time and the log of the intensity at the boundary are recorded. For the 40 keV "sharp" boundary and the three higher energy background boundaries, only the invariant latitude

is recorded; the local time could be estimated approximately from the 40 keV "background" and 40 keV "smooth" boundary local times if it were required.

- e) The 1-8 MeV counter detects particles in that energy range and does not discriminate among the different energies. At the point where the counting rate reaches its background value, the higher energy particles have disappeared and the invariant latitude recorded is essentially the background boundary for the 1 MeV particles.
- 5. The local magnetic time, magnetic field and intensity data which are missing from the "Intensity Maximum" and "Intensity Minimum" entries were omitted either because they were of little significance (e.g. in the intensity minima, the local times and $3.9 \text{ MeV } \log I$) or for reasons of economy. The missing magnetic fields and local times could, if necessary, be inferred with sufficient accuracy from the other values given for the pass.
- 6. "Col 120" is a code used in our program for producing the tapes and is of no significance to the data.

D-13531

***** DEUTA *****
\$NOP *****
\$SEX TPLSV BS *****

~~INPUT PARAMETERS ARE: ED FL=20=20 1~~

TAPE NO.	FILE NO.	1	FILE NO.	1
RECORD	1	120	LENGTH	120
5	16553320112176000	0 92 93200	0 0 0 0	0 0 0 0 0654
				0637248287 94624110287 0 0

TAPE NO. 1	FILE NO. 1
RECORD 2	LENGTH 120
5 256535064910	59233 19740 0 0 0153 0 0729683 0162179 0669654640410190183 0 0 0 0 0

TAPE NO.	1	FILE NO.	1
RECORD	3	LENGTH	120
3	3564336031021	58333	9717 0674716184189270 0 0 0 0 0 0663645639390181193638120181 0 0

	TAPE NO.	FILE NO.
RECORD	4	LENGTH
5	38536091720	65233
	0657637641400196183637126195636170	0

TAPE NO.	1	FILE NO.	1
RECORD	5	LENGTH	120
5	4865337052520	57/ 0 2 0 0693	0 0 0 0 0 0684 0 0 0184 0 0 0 0 0 0

TAPE NO.	FILE NO.
1	1
RECORD 6	LENGTH 120
2	0713692637639380173207635135172636196

TAPE NO.	1	FILE NO.	1
RECORD	7	LENGTH	120
5	78653319175312	79633	0 85 85140
		0720	0 0 0 0
			0 0691631662330275
			85638 80277
			0 0

TAPE NO.	FILE NO.
1	1
RECORD 8	LENGTH 120
5	0 677646493701851766321101806334140

[illegible]

TAPE NO.	FILE NO.	RECORD	LENGTH
1	1	10	120

TAPE NO.	FILE NO.
1	1
RECORD 11	LENGTH 120