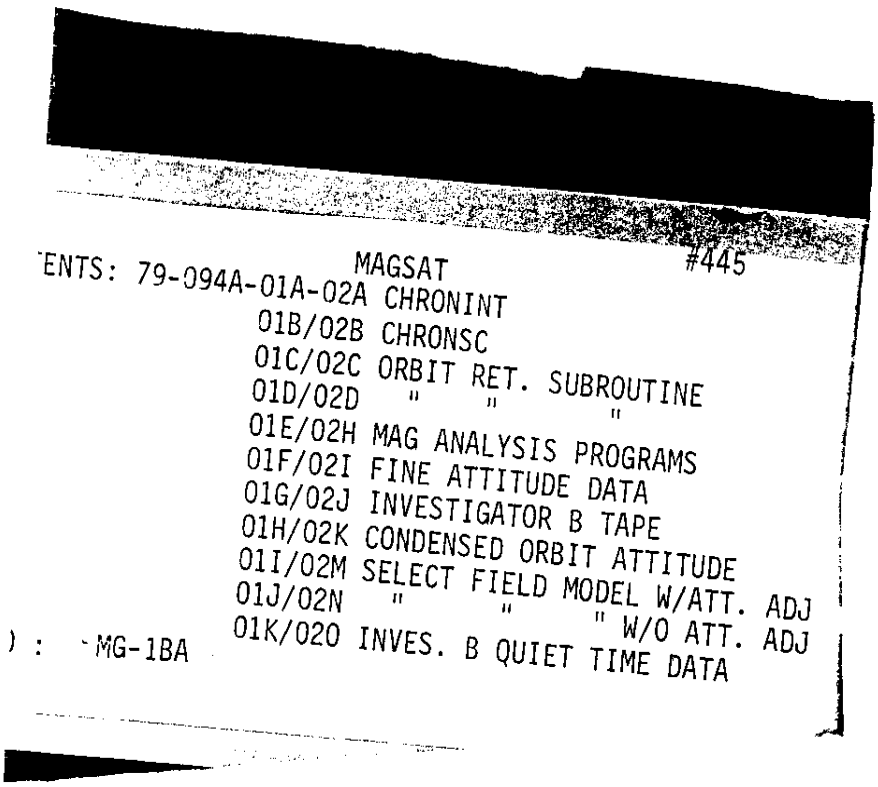

MAGSAT #445

ENTS: 79-094A-01A-02A CHRONINT
01B/02B CHRONSC
01C/02C ORBIT RET. SUBROUTINE
01D/02D " " "
01E/02H MAG ANALYSIS PROGRAMS
01F/02I FINE ATTITUDE DATA
01G/02J INVESTIGATOR B TAPE
01H/02K CONDENSED ORBIT ATTITUDE
01I/02M SELECT FIELD MODEL W/ATT. ADJ
01J/02N " " " W/O ATT. ADJ
) : MG-1BA 01K/020 INVES. B QUIET TIME DATA

Table of Contents

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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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

MAGSAT

THIS CATALOG CONTAINS VARIOUS MAGSAT DATA SETS. EACH DATA SET IS LISTED WITH DOCUMENTATION. THE MAGSAT USERS GUIDE (B33579-000A) IS AVAILABLE FOR DISTRIBUTION. THERE ARE 3 OTHER DOCUMENTS AVAILABLE ON REQUEST, DEVELOPMENT OF INTERPRETIVE ANOMALY MAGNETIZATION MODELS AND COMPILATION OF MAGSAT CORRELATIVE DATA BASE, VOL.1 (B35144-000A) AND VOL. 2 (B35145-000A), AND MAGNETIC ANOMALIES AT SATELITTE ELEVATION OVER AUSTRALIA (B35143-000A).

Refer to 79-094A-01B

MAGSAT

CHRONINT (CHRONICLE INTERMED), TAPE

79-094A-01A,02A SPMS-00400

THESE DATA SETS HAVE BEEN RESTORED. ORIGINALLY THERE WERE 34 9-TRACK, 6250 BPI TAPES WRITTEN IN BINARY. THERE ARE 31 RESTORED TAPES. THREE OF THE ORIGINAL TAPES ARE MISSING, D040908, D047244 AND D047245. 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 AND WERE RESTORED ON THE IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND THE TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004126	DS004126	D035165	1	11/04/79 - 11/04/79
DR004127	DS004127	D037948	1	11/02/79 - 11/09/79
DR004128	DS004128	D040415	1	11/02/79 - 11/07/79
DR004129	DS004129	D040416	1	11/08/79 - 11/15/79
DR004130	DS004130	D040417	1	11/16/79 - 11/23/79
DR004131	DS004131	D040418	1	11/24/79 - 12/01/79
DR004132	DS004132	D040419	1	12/02/79 - 12/09/79
DR004133	DS004133	D040420	1	12/10/79 - 12/17/79
DR004134	DS004134	D040421	1	12/18/79 - 12/25/79
DR004135	DS004135	D042016	1	12/25/79 - 01/02/80
DR004136	DS004136	D040422	1	01/02/80 - 01/10/80
DR004137	DS004137	D042017	1	01/18/80 - 01/26/80
DR004138	DS004138	D042018	1	01/26/80 - 02/03/80
DR004139	DS004139	D041970	1	02/03/80 - 02/11/80
DR004140	DS004140	D041971	1	02/11/80 - 02/19/80
DR004141	DS004141	D041972	1	02/19/80 - 02/27/80
DR004142	DS004142	D041973	1	02/27/80 - 03/06/80
DR004143	DS004143	D043351	1	03/06/80 - 03/14/80
DR004144	DS004144	D041974	1	03/14/80 - 03/22/80

79-094A-01A,02A

DR#	DS#	D#	FILES	TIME SPAN
DR004145	DS004145	D041975	1	03/22/80 - 03/30/80
DR004146	DS004146	D043025	1	03/30/80 - 04/07/80
DR004147	DS004147	D042019	1	04/07/80 - 04/15/80
DR004148	DS004148	D043026	1	04/15/80 - 04/23/80
DR004149	DS004149	D042020	1	04/23/80 - 05/01/80
DR004150	DS004150	D043352	1	05/01/80 - 05/09/80
DR004151	DS004151	D043080	1	05/09/80 - 05/17/80
DR004152	DS004152	D043081	1	05/18/80 - 05/25/80
DR004153	DS004153	D047242	1	05/20/80 - 05/25/80
DR004154	DS004154	D043082	1	05/25/80 - 06/02/80
DR004155	DS004155	D047243	1	05/26/80 - 06/02/80
DR004311	DS004311	D043353	1	06/03/80 - 06/09/80

D-35165

79-094A-01A/02A

~~S...~~ Mag. Info

CHRONINT

DUMP OF TAPE X453

INPUT TAPE X453 ON MT2 NOV 4, 1979

DATA INPUT H9 FL 1 2 2

FILE 1 RECORD 1 LENGTH 28886BYTES

(0)	70D60000	0C1C0000	00010000	0000AC95	03BCB9E0	0CC0EA60	44AC9100	40A883B2	43CFC046	43C1589F
(40)	43B21002	43A1F7A5	439121D0	437FA1C5	436D8BAA	435AF476	4347F1D4	43349A09	432103DB	42D4673E
(80)	C2686BE1	C31A4C24	C32DF21D	C3416121	C35481D7	C3673D3F	C3797CC8	C38B2A73	C39C30E0	C3AC7BBB
(120)	C3BBF73A	C3CA90D4	C3D8370D	C3E4D99F	C3F0698F	C3FAD93F	C41041C8	C410C28A	C4112F48	C411878A
(160)	C411CAF1	C411F938	C4121234	C41215D7	C412042B	C411DD54	C411A18F	C4115134	C410ECB1	C410748B
(200)	C3FE9603	C3F4BDFF	C3E9CD05	C3DDD099	C3D0D759	C3C2F0E4	C3B42DCB	C3A49F77	C3945812	C3836A75
(240)	C371EA0D	C35FEAC8	C34D80FE	C33AC15B	C327C0CF	C314946E	C215167D	4311F314	432523E9	43382C1C
(280)	434AF6EC	435D6FE4	436F82E9	43811C52	439228F4	43A29639	43B2522B	43C14B89	43CF71D5	43DCB567
(320)	43E90779	43F45A34	43FEA0C9	44107CF7	4410FDB8	44116BB9	43F699F5	44100E03	44109AC2	44111835
(360)	441182C7	4411D9F8	44121D5B	44124C98	4412676D	44126DAD	44125F43	44123C2F	4412048B	4411B884
(400)	44115861	4410E481	44105D58	43FC372F	43F17728	43E5A0FE	43D8C18B	43CAE6F5	43BC209E	43AC7E18
(440)	439C140D	438AF233	43792D33	4366D993	43540C9C	4340DC47	432D5F19	4319AC11	425DA83E	C2DFE005
(480)	C321C5CE	C335653C	C348C4C1	C35BCD14	C36E674D	C325859D	C3392068	C34C76CE	C35F7191	C371F9D8
(520)	C383F94D	C3955A40	C3A607C1	C3B5EDBD	C3C4F919	C3D317CE	C3E03901	C3EC4D18	C3F745D1	C4101165
(560)	C4109B34	C411112C	C41172CA	C411BFA2	C411F765	C41219DD	C41226EF	C4121E99	C41200F5	C411CE36
(600)	C41186A8	C4112AAF	C410BAC8	C4103785	C3FA18F1	C3FF9A2B	C3E4090C	C3D773BE	C3C9E97A	C3BB7A72
(640)	C3AC37BA	C39C3333	C38B7F79	C37A2FC4	43F2A6B8	43FFB7F3	4410B97C	4411638A	4411F8E7	441278ED
(680)	4412E313	441336E8	44137419	44139A6F	4413A9CE	4413A237	441383C7	44134EB3	4413034D	4412A200
(720)	44122B4F	44119FD6	44110046	44104D66	43F88140	43EB13C6	43DC9E09	43CD3119	43BCDEF7	43ABBA80
(760)	4399D756	438749CC	437426CD	436083C8	434C769B	4338157D	432376E6	42EB17F3	C2623F98	C31AF2BF
(800)	C32FA41D	C3442187	C35854A7	C36C2777	C37F8451	C3925605	C3A487ED	C3B69601	C3C6BCE7	C3D69A09
(840)	C3E58BA8	C3F380ED	C410069F	C410C380	C3D93D80	C3E7FDC6	C3F5BEE9	C4102713	C410E062	C4118704
(880)	C4121A33	C412993F	C413038E	C413589A	C41397F4	C413C144	C413D44D	C413D0E6	C413B703	C41386AF
(920)	C4134011	C412E368	C412710D	C411E973	C4114D28	C4109CD1	C3FD92C6	C3F030FF	C3E1B698	C3D233CA
(960)	C3C1BA22	C3B05C6C	C39E2E9E	C38B45C1	C377B7D9	C3639BCB	C34F093E	C33A1884	C324E273	C2F804CB
(1000)	425F465E	431B61F4	4330AEAB	C320D28A	C2B701AA	42A00053	431F6427	4334A2A1	4349A1EA	435E48C1
(1040)	43727E4F	43862A43	439934FA	43AB879D	43BD0C3D	43CDADF6	43DD5905	43EBFAE9	43F98277	44105DFE
(1080)	44111051	4411AE53	44123754	4412AABE	44130816	44134EFD	44137F30	44139887	44139AF7	4413868F
(1120)	44135B7C	44131A03	4412C283	44125574	4411D367	44113D04	44109307	43FD6443	43F079EE	43E280FF
(1160)	43D38A05	43C3A689	43F22C6D	43C98E69	43AFFEFA	43959D1C	437A88B2	435EE25D	4342CB4D	43266514
(1200)	429D177A	C312CDBC	C32F56E0	C34BA899	C367A206	C38322EA	C39EDBCA	C3B83E18	C3D19C51	C3EA0A1A
(1240)	C41016C6	C4117A97	C412CA92	C414054C	C4152974	C41635D6	C4172957	C41802FA	C418C1E1	C41954A
(1280)	C419EC91	C41A5732	C41AA4C6	C41AD506	C41AE7CA	C41ADD07	C41AB4D3	C41A6F61	C41A0D03	C4198E27
(1320)	C418F35A	C4183D46	C4176CAF	C4168276	C4157F99	C414652B	C413345D	C411EE76	C41094D3	C3F28E91
(1360)	C3DAC40D	C3C2076D	C411AE6F	C4105133	C3EE1F9D	C3D624E5	C3BD3D10	C3A3833A	C389137E	[illegible]
(1400)	C352873D	C336A70F	C31A8970	421B2178	431DEBB0	433A0354	4355D8F0	43714C8D	438C3E71	43A68F48
(1440)	43C02045	43D8D34F	43F08B1E	441072B6	4411C990	44130BA1	44143761	44154B61	4416464D	441726ED
(1480)	4417EC27	441895C3	441920A7	44198E5E	4419DD99	441A0DEA	441A1F0B	441A100C	4419E363	4419960F
(1520)	44192B74	441A1EB4	441A0A87	4419D717	44198498	44191366	44188405	4417D71B	4417CD77	4416280B
(1560)	441527EA	44140E4B	4412DC84	44119408	44103668	43EC54E6	43D427A8	43BAFC36	43A0F118	438625D1
(1600)	436ABAB4	434ED085	4332893E	431605FF	C26973C8	C3232CBD	C33F9906	C35BBB06	C3777238	C3929E01
(1640)	C3AD21E2	C3C6DD75	C3DFB4B5	C3F78C06	C410E492	C4123D32	C413812D	C414AF26	C415C5DB	C416C428
(1680)	40743AA4	4062BDEC	40513021	403FD3EC	402EE4F4	401F1EEE	4013E262	40163E99	4023CEDA	4034CD19
(1720)	4046E411	40596F0C	406C3906	407F2F35	40925115	40A57767	40B89A1D	40CBAC0C	40DEAD1E	40F1909A
(1760)	41104461	411168E5	41128EA6	4113ABAD	4114C1BD	4115CEAE	4116CD1B	4117A9F5	411815F8	4117A5DC
(1800)	4116C886	4115DB72	4114E7C9	4113F55A	411305BA	41121978	411130B8	41104B72	40F6987F	40E8ADA5
(1840)	40DAF600	40CD74BD	40C05E0E	40B3AFB3	40A754EC	409B52A7	408FE6FC	40851F3D	407B1AD5	407205D1
(1880)	408E8429	408354E1	4078DF1B	406F4129	4066AA4A	405F785A	405A17E0	4056EDBF	405647AE	40584C43
(1920)	405CE5A0	4063D4C8	406CC735	40775EF0	4083544F	409058E1	409E2B82	40AC80AA	40BB5EF9	40CAA481
(1960)	40DA28D1	40E9CF73	40F9903D	411094F3	41118EF1	41128511	41137530	41145CB6	411537B2	4115FECD
(2000)	4116A2CE	41170798	41170BFB	4116B0B2	41161581	411557DC	41148701	4113A985	4112C1F2	41158DEC
(2040)	4114FF61	41144EB2	41138611	4112AB47	4111C194	4110CB08	40FC942B	40EBDE3C	40DA9B31	40C8C31E
(2080)	40B6741F	40A3C550	4090BCAE	407D30D8	40696320	4055563A	4040D968	402B71E7	4012BBF3	C4270F00
(2120)	C4270F00	401738EA	402ECF62	40439C3B	4057758D	406AB7C3	407D76D4	408FA99E	40A1219A	40B1B80F
(2160)	40C18369	40D085EF	40DEDAC9	40EC6474	40F91B00	41105061	411102A1	4111A8CC	4138C1BC	41380584
(2200)	413756DC	4136B2E1	4136174F	4135A22B	4134F1D2	413464D1	[illegible]	[illegible]	[illegible]	[illegible]
(2240)	4131A913	4131154P	41307B91	412FDA0D	412F2EA8	412E76C2	412DAF30	412CD3E0	412BDF70	412ACAD9

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(22760)	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
(22800)	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
(22840)	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
(22880)	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
(22920)	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	C7600C1C	00000007	00000000
(22960)	AC9[illegible]409	A16[illegible]	EA6044AC	910042A8	83B24412	3F644412	0BA14411	C3784411	672A4410	F7114410
(23000)	739E43FD	D58D43F3	4DDA43E7	AE1743DB	02DC43CD	5A0B43BE	C2CA43AF	4D6B439F	0B61438E	0F29437C
(23040)	6C3A436A	36EC4357	84604344	6A674330	FF6A431D	5A4B4299	24A7C2A4	1191C31E	083DC331	AB7BC345
(23080)	134AC358	2859C36A	D3B1C37C	FED6C38E	93E0C39F	7D9CC3AF	A7ACC3BE	FE9CC3CD	7004C3DA	EA9CC3E7
(23120)	5C55C3F2	BC7CC3FC	F791C410	603CC410	DD6CC411	4679C411	9AEFC411	DA76C412	04CEC412	19D1C412
(23160)	1974C412	03C7C411	D8F3C411	993BC411	44FAC410	DCA3C410	60C0C3FD	1F35C3F3	0EFFC3E7	E800C3DB
(23200)	B7F5C3CE	8DB1C3C0	7905C3B1	8AAFC3A1	D440C391	680AC380	5904C36E	BABBC35C	A136C34A	20E2C337
(23240)	4E80C324	3F0BC311	07A54224	27DE4315	8A294328	BA40433B	BDCD434E	80154360	ECAC4372	EF874384
(23280)	750C4395	6A2743A5	BC5743B5	59C243C4	314443D2	328243DF	4DF543EB	74FF43F6	99F54410	0B034410
(23320)	9AC24411	18354411	82C74411	D9F84412	1D5B4412	4C984412	676D4412	6DAD4412	5F434412	3C2F4412
(23360)	04884411	88844411	58614410	E4814410	5D5843FC	372F43F1	772843E5	A0FE43D8	C18B43CA	E6F543BC
(23400)	209E43AC	7F18439C	140D438A	F2334379	2D334366	D9934354	0C9C4340	DC47432D	5F194319	AC11425D
(23440)	A83EC2DF	E005C321	C5CEC335	653CC348	C4C1C35B	CD14C36E	674DC380	7D03C391	F869C3A2	C46BC3B2
(23480)	CCD1C3C1	FE54C3D0	46BAC3DD	94F0C3E9	D922C3F5	04D0C3FF	0ADCC410	7DFAC410	F790C411	5CE7C411
(23520)	AD90C411	E936C412	0F9EC412	20A8C412	1C4EC412	02A4C411	D3D9C411	9033C411	3813C410	CBF0C410
(23560)	4C59C3FB	9F39C3F1	5773C3E5	FB1AC3D9	9820C3CC	3D8EC3BD	FB65C3AE	E28DC39F	04C1C38E	7476C37D
(23600)	44C6C36B	8959C359	564FC346	C02EC333	DBC7C320	BE22C2D7	C6C5425D	41EA4319	1E48432C	4CF3433F
(23640)	4B2E43F4	FB4E4410	1D114410	D7304411	7D3F4412	0E814412	8A564412	F0394413	3FBF4413	789A4413
(23680)	9A994413	A5A54413	99C54413	77194413	3DDC4412	EE664412	89254412	0FA24411	7F7B4410	DC674410
(23720)	263043F5	DB6743E8	3EAF43D9	9D1843CA	07D943B9	911943A8	4BD74396	4BD14383	A5714370	6DB9435C
(23760)	BA264346	A0A44334	376F431F	950642AD	00F8C2A0	0B8FC31E	C696C333	6AE1C347	D719C35B	F4FDC36F
(23800)	AE9CC382	EE6AC395	9F55C3A7	ACD6C3B9	0309C3C9	8EBAC3D9	3D80C3E7	FDC6C3F5	BEE9C410	2713C410
(23840)	E062C411	8704C412	1A33C412	993FC413	038EC413	589AC413	97F4C413	C144C413	D44DC413	D0E6C413
(23880)	B703C413	86AFC413	4011C412	E368C412	710DC411	E973C411	4D28C410	9CD1C3FD	92C6C3F0	30FFC3E1
(23920)	D698C3D2	33CAC3C1	BA22C3B0	5C6CC39E	2E9EC38B	45C1C377	B7D9C363	9BCBC34F	093EC33A	1884C324
(23960)	E273C2F8	04CB425F	465E431B	61F44330	AEAB4345	C0F2435A	7F73436E	D1364382	9DCC4395	CD6643A8
(24000)	48FD43B9	EA6F43CA	CC9B43DA	AB8143E9	845943F7	45B14410	3DF74410	F4334411	963C4412	235F4412
(24040)	9AFE4412	FC9A4413	47CF4413	7C544413	99FC4413	A0B64413	908E4413	69A94413	2C484412	D8C74412
(24080)	6F984411	F1494411	5E7C4410	B7EC43FF	E66F43F3	2CEC43E5	618E43D6	94B743C6	D7C943B6	3D1043A4
(24120)	D7AA4392	BB71437F	FCE8436C	B1234358	EDB14344	C8874330	57EC431B	B25E426E	E87243DD	864E43C4
(24160)	B7DB43AA	FDEC4390	77874375	44DC4359	869D433D	5F104320	ECD14245	4AB9C318	4899C334	C962C351
(24200)	CC69C36C	F0EDC388	56D2C3A3	1ECBC3BD	2A7CC3D6	5C9AC3EE	9909C410	5C4FC411	BC70C413	0875C414
(24240)	3EF6C415	5EAAC416	6660C417	5503C418	299DC418	E354C419	816CC41A	0348C41A	6867C41A	B06BC41A
(24280)	DB11C41A	E837C41A	D7D9C41A	AA11C41A	5F18C419	F746C419	7310C418	D306C418	17D8C417	4250C416
(24320)	5354C415	4BE6C414	2D1FC412	F833C411	AE6FC410	5133C3EE	1F9DC3D6	24E5C3BD	3D10C3A3	833AC389
(24360)	137EC36E	0AE3C352	873DC336	A70FC31A	8970421B	2178431D	EBB0433A	03544355	D8F04371	4C8D438C
(24400)	3E7143A6	8F4843C0	204543D8	D34F43F0	8B1E4410	72B64411	C9904413	0BA14414	37614415	4B614416
(24440)	464D4417	26ED4417	EC274418	95034419	20A74419	8E5E4419	DD99441A	0DEA441A	1F0B441A	10DC4419
(24480)	E3634419	96CF4419	2B744418	A1CC4417	FA794417	36414416	560E4415	5AF04414	46144413	18CC4411
(24520)	D4854410	7ACB43F0	D42843D8	DA7D43BF	DCDD43A5	F99D438B	50164370	00794354	2B9F4337	F2E2431B
(24560)	77EAC212	37CFC31D	BD91C33A	34C6C356	67EFC372	3666C38D	8039C3A8	2647C3C2	0A67C3DB	0F8AC3F3
(24600)	19D3C410	A0EBC411	FD51C413	4555C414	7796C415	92CEC416	95D2C417	7F93C418	4F1FC419	03A3C419
(24640)	9C68C41A	18D6C41A	7874C41A	BAE7C41A	DFF4C41A	E77EC41A	D187406C	C34D4059	19C04044	AD23402E
(24680)	AF184012	CF76C427	0F00C427	0F00C427	0F004015	15404030	CE4C4047	631C405C	9AB14071	3C424085
(24720)	39464099	8BFF40AD	30C140C0	7E5740D3	7A5040E6	0B7440F8	236A4110	9B3E4111	AAB24112	AEF64113
(24760)	A5874114	8A2B4115	55674115	F9D04116	61344116	715A4116	25514115	96DA4114	E18F4114	161C4113
(24800)	3D994112	5D2D4111	78044110	904C40FA	7A6840EB	F67840DD	8BA540CF	4C2040C1	520040B3	F82B40A7
(24840)	07C5409A	8212408E	84294083	54E14078	DF1B406F	41294066	AA4A405F	785A405A	17E04056	EDBF4056
(24880)	47AE4058	4C43405C	E5A04063	D4C8406C	C7354077	5EF04083	544F4090	58E1409E	2B8240AC	80AA40BB
(24920)	5EF940CA	A48140DA	28D140E9	CF7340F9	903D4110	94F34111	8EF14112	85114113	75304114	5CB64115
(24960)	37B24115	FECD4116	A2CE4117	07984117	0BFB4116	BCB24116	15814115	57DC4114	87014113	A9854112
(25000)	C1E24111	D0CC4110	D62440FD	222A40EC	569840DA	FC7340C8	FB4740B6	69B840A3	5BAE408F	B2CB407B
(25040)	61AA4066	6F0A4050	BAAD4039	785F401D	9D9CC427	0F00C427	0F00C427	0F00C427	0F00401E	C3FE4039
(25080)	72C2404F	E4A74064	DFE94079	1183408C	A6A3409F	88C640B1	D9BC40C3	99AD40D4	C23540E5	420240F5
(25120)	0CED4110	41914111	25A04111	FBC64112	C20D4113	75364114	10034114	8A7F4114	DA534114	F5E94114
(25160)	D99F4114	89D64114	0FBC4113	75824112	C42E4138	A5834137	EC1D4137	3FB34136	9D6F4136	03324135
(25200)	6F0C4134	DF6B4134	52F24133	C8134133	3DCB4132	B2D54132	25E94131	95C14131	00E84130	65CB412F
(25240)	C284412F	14E5412E	5A3D412D	8F32412C	AF74412B	B56E412A	99A24129	51C54127	CF3F4125	FCB04123
(25280)	B98D4120	D1FC411C	EECB4117	741F40F3	9F0C401F	F2204216	C1F14214	D49D4213	11644211	F21C4211
(25320)	48264210	DDAF4210	95F84210	62934210	3BE24210	1D954210	051341FF	0BAA41FD	F72141FD	07A841FC
(25360)	34B841FE	781841FA	CD2041FA	302E41F9	9E6F41F9	159B41F8	93D741F8	179441F7	9F6C41F7	2A2B41F6

MAGSAT

CHRONSE (CHRONICLE SPACECRAFT)

79-094A-01B,02B SPMS-00417

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED 29 9-TRACK, 6250 BPI TAPES WRITTEN IN BINARY. THERE ARE 29 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 AND WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND THE TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004264	DS004264	D040423	1	11/02/79 - 11/07/79
DR004265	DS004265	D035166	1	11/04/79 - 11/04/79
DR004266	DS004266	D040424	1	11/08/79 - 11/15/79
DR004267	DS004267	D040425	1	11/16/79 - 11/23/79
DR004268	DS004268	D040426	1	11/24/79 - 12/01/79
DR004269	DS004269	D040427	1	12/02/79 - 12/09/79
DR004270	DS004270	D040428	1	12/10/79 - 12/17/79
DR004271	DS004271	D040429	1	12/18/79 - 12/25/79
DR004272	DS004272	D042021	1	12/25/79 - 01/02/80
DR004273	DS004273	D040909	1	01/02/80 - 01/10/80
DR004274	DS004274	D040430	1	01/10/80 - 01/18/80
DR004275	DS004275	D042022	1	01/18/80 - 01/26/80
DR004276	DS004276	D042023	1	01/26/80 - 02/03/80
DR004277	DS004277	D041976	1	02/03/80 - 02/11/80
DR004278	DS004278	D041977	1	02/11/80 - 02/19/80
DR004279	DS004279	D041978	1	02/19/80 - 02/27/80
DR004280	DS004280	D041979	1	02/27/80 - 03/06/80
DR004281	DS004281	D043354	1	03/06/80 - 03/14/80
DR004282	DS004282	D041980	1	03/14/80 - 03/22/80

74-094A-01B,02B

DR#	DS#	D#	FILES	TIME SPAN
DR004283	DS004283	D041981	1	03/22/80 - 03/30/80
DR004284	DS004284	D043027	1	03/30/80 - 04/07/80
DR004285	DS004285	D042024	1	04/07/80 - 04/15/80
DR004286	DS004286	D043028	1	04/15/80 - 04/23/80
DR004287	DS004287	D042025	1	04/23/80 - 05/01/80
DR004288	DS004288	D043355	1	05/01/80 - 05/09/80
DR004289	DS004289	D043077	1	05/09/80 - 05/17/80
DR004290	DS004290	D043078	1	05/18/80 - 05/25/80
DR004291	DS004291	D043079	1	05/26/80 - 06/02/80
DR004292	DS004292	D043356	1	06/03/80 - 06/09/80

REQ. AGENT	RAND #	ACQ. AGENT
DEW	V0105 V0118	HKH

MAGSAT

SCALAR MAGNETOMETER
CHRONOLOGICAL INTERMEDIATE DATA
CHRONOLOGICAL SPACECRAFT DATA
79-094A-01A,01B

VECTOR MAGNETOMETER
CHRONOLOGICAL INTERMEDIATE DATA
CHRONOLOGICAL SPACECRAFT DATA
79-094A-02A,02B

THIS DATA SET CONSISTS OF 34 CHRONINT AND 29 CHRONSC DATA TAPES. THE TAPES ARE 9-TRACK, 6250 BPI, WITH 1 FILE OF DATA. THE TAPES WERE CREATED ON AN IBM 360 COMPUTER. THE D AND C NUMBERS ALONG WITH THE TIME SPANS FOLLOW:

79-094A-01A,02A
CHRONINT

D#	C#	TIME SPAN
D-35165	C-20796	11/04/79 - 11/04/79
D-37948	C-20895	11/02/79 - 11/09/79
D-40415		11/02/79 - 11/07/79
D-40416		11/08/79 - 11/15/79
D-40417		11/16/79 - 11/23/79
D-40418		11/24/79 - 12/01/79
D-40419		12/02/79 - 12/09/79
D-40420		12/10/79 - 12/17/79
D-40421		12/18/79 - 12/25/79
D-42016		12/25/79 - 01/02/80
D-40422		01/02/80 - 01/10/80
D-40908		01/10/80 - 01/18/80
D-42017		01/18/80 - 01/26/80
D-42018		01/26/80 - 02/03/80
D-41970		02/03/80 - 02/11/80
D-41971		02/11/80 - 02/19/80

CHRONINT 79-094A-01A/02A

D#	C#	TIME SPAN
D-41972		(02/19/80-02/27/80)
D-41973		02/27/80-03/06/80
D-43351		03/06/80-03/14/80
D-41974		03/14/80-03/22/80
D-41975		03/22/80-03/30/80
D-43025		03/30/80-04/07/80
D-42019		04/07/80-04/15/80
D-43026		04/15/80-04/23/80
D-42020		04/23/80-05/01/80
D-43352		05/01/80-05/09/80
D-43080		05/09/80-05/17/80
D-43081		05/18/80-05/25/80
D-43082		05/26/80-06/02/80
D-43353		06/03/80-06/09/80
D-47242		05/20/80-05/25/80
D-47243		05/26/80-06/02/80
D-47244		06/03/80-06/09/80
D-47245		06/10/80

79-094A-01B/02B

CHRONSC

D#	C#	TIME SPAN
D-35166	C-20797	11/04/79-11/04/79
D-40423		11/02/79-11/07/79
D-40424		11/08/79-11/15/79
D-40425		11/16/79-11/23/79
D-40426		11/24/79-12/01/79
D-40427		12/02/79-12/09/79
D-40428		12/10/79-12/17/79
D-40429		12/18/79-12/25/79
D-42021		12/25/79-01/02/80
D-40909		01/02/80-01/10/80
D-40430		01/10/80-01/18/80
D-42022		01/18/80-01/26/80
D-42023		01/26/80-02/03/80
D-41976		02/03/80-02/11/80
D-41977		02/11/80-02/19/80
D-41978		02/19/80-02/27/80
D-41979		02/27/80-03/06/80
D-43354		03/06/80-03/14/80
D-41980		03/14/80-03/22/80
D-41981		03/22/80-03/30/80
D-43027		03/30/80-04/07/80
D-42024		04/07/80-04/15/80
D-43028		04/15/80-4/23/80
D-42025		04/23/80-05/01/80

CHRONSC

D#	C#	TIME SPAN
D-43355		05/01/80-05/09/80
D-43077		05/09/80-05/17/80
D-43078		05/18/80-05/25/80
D-43079		05/26/80-06/02/80
D-43356		06/03/80-06/09/80

Attachment 1 - Chronicle Tape Format

Internal Format (IED Data Base)

6250 bpi binary
Blocked - max block size 28,886 bytes

Investigator Formats

Various densities
Blocked and unblocked

Pad Data Denoted by 99999.0

CHRONICAL TAPE FORMAT - BINARY

TIME ORDERED

FORTRAN READABLE

A. ORBIT DATA RECORD (128 minutes)

B.* SCALAR DATA RECORD (512 values)

C.* 3 VECTOR COMPONENT DATA RECORDS (1024 values each)

} each 128 minor frames or ~62.9 sec

D. ATTITUDE QUALITY (If in fine topocentric coordinates 256-values)

E. ITEMS B-D REPEATED FOR TIME PERIOD OF ORBIT RECORD

F. SEQUENCE A-E REPEATED

G. EOF

*NOTE: ~~There is no guarantee of the order of B and C~~

THE ORBIT DATA RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: = 0, indicating satellite position data	*L*1
1	Data type of next record	**L*1
2	Spare	
4	Date of first observation (MJD)	I*4
8	Milliseconds of day for first observation	I*4
12	Time increment between observations (MS)	I*4
16	Reference time (epoch) of coordinate system (MJD ~~+ fraction of day~~) at 0^h UTC	R*4
20	Greenwich hour angle at epoch (in radians)	R*4
24	X inertial coordinate (km, 128 values)	R*4
536	Y inertial coordinate (km, 128 values)	R*4
1048	Z inertial coordinate (km, 128 values)	R*4
1560	Invariant Latitude (128 values), degrees	R*4
2072	Geomagnetic time (128 values), hours	R*4
2584	Dip latitude (128 values), degrees	R*4

*8 bit binary value
** On investigator copy only

Definition of MJD:

Day number of 1979 is (MJD − 43873).

Thus MJD = 44181 denotes Day 308, 1979 (Nov. 4).

THE CHRONICLE SCALAR DATA RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: = 1, indicating scalar observations	*L*1
1	Data type of next record	**L*1
2	Spacecraft status (5 digit integer – abcde) a = 1, calibration on b = 1, electronic flip on c = 1, x coil on d = 1, y coil on e = 1, z coil on	I*2
4	Date of first observation (MJD)	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observation (ms)	R*4
16	Time offset (ms)	R*4
20	Spare	I*4
24	Scalar observations (gammas – 512 values	R*4
2072	Number of points in this record that overlap with the next scalar record	I*2

*8 bit binary value
**On investigator copy only

THE VECTOR DATA (SENSOR PLATFORM COORDINATES) CHRONICLE RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: = 2, 3, 4, indicating vector a, b, or c observations, respectively	*L*1
1	Data type of next record	**L*1
2	Spacecraft status (5 digit integer - abcde) a = 1, calibration on b = 1, electronic flip on c = 1, x coil on d = 1, y coil on e = 1, z coil on	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time offset (ms)	R*4
20	Spares	I*4
24	Fine counts (1024 values, pad = 9999)	I*2
2072	Coarse counts (1024 values, pad = 255)	L*1
3096	Number of points in this record that overlap with the next record of this type	I*2

*8 bit binary value
**On investigator copy only

THE VECTOR DATA (NEV COORDINATES) CHRONICLE RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: =5, 6, 7, indicating vector x,y, or z observations, respectively, generated from intermediate attitude data =8, 9, 10, for data generated from fine attitude data	*L*1
1	Data type of next record	**L*1
2	Spacecraft status (see record types 2-4)	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time Offset (ms)	R*4
20	Spare	-
24	Vector component observations (gammas; 1024 values)	R*4
4120	Number of points in this record that overlap with the next record of this type	I*2

*8 bit binary value
**On investigator copy only

THE ATTITUDE QUALITY CHRONICLE RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameters	Type
0	Data type: =16, indicating attitude quality data	*L*1
1	Data type of next record	**L*1
2	Spare	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time offset (ms)	R*4
20	Spare	I*4
24	Attitude processing flags (synchronized with every fourth vector observation starting with first observation of record)	I*2

*8 bit binary value
**On investigator copy only

PROCESSING FLAG DEFINITION

A five-character processing flag, ±abcde, is defined as follows:

Character	Description
a	Smoothing character (level of smoothing of final attitude): = 0, no smoothing = 1, linear smoothing = 2, nonlinear smoothing
b	Residual character: = 0, all residuals within boundaries = 1, QUEST* residual and SC1 acceptable, SC2 bad = 2, QUEST residual acceptable, SC1 bad, SC2 acceptable = 3, QUEST residual acceptable, SC1 and SC2 bad = 4, QUEST residual bad, SC1 and SC2 acceptable = 5, QUEST residual bad, SC1 acceptable, SC2 bad = 6, QUEST residual and SC1 bad, SC2 acceptable = 7, QUEST residual SC1, and SC2 bad
c	Gyro and ATS character: = 0, observed gyro point, observed ATS point = 1, observed gyro point, interpolated ATS point = 2, observed gyro point, default ATS value = 3, interpolated gyro data, observed ATS point = 4, interpolated gyro data, interpolated ATS point = 5, interpolated byro data, default ATS value = 6, gyro data point invalid, observed ATS point = 7, gyro data point invalid, interpolated ATS point = 8, gyro data point invalid, default ATS value

*QUEST referes to the attitude determination least squares program.

PROCESSING FLAG DEFINITION (cont'd)

Character	Description
d	Attitude computation character (method of final attitude computation): = 0, with QUEST, using three vectors = 1, with QUEST, using SC1 and SC2 = 2, with QUEST, using SC1 and FSS = 3, with QUEST, using SC2 and FSS = 4, using SC1 and gyro = 5, using SC2 and gyro = 6, using FSS and gyro = 7, not computed
e	Pattern matching character: = 0, SC1 and SC2 valid, identified = 1, SC1 valid, identified; SC2 valid, not identified = 2, SC1 valid, identified; SC2 not valid = 3, SC1 valid, not identified; SC2 valid, identified = 4, SC1 valid, not identified; SC2 valid, not identified = 5, SC1 valid, not identified; SC2 not valid = 6, SC1 not valid; SC2 valid, identified = 7, SC1 not valid; SC2 valid, not identified = 8; SC1 not valid; SC2 not valid

HEX DUMP OF 40423

11/1/79

DR\DS0042\64

FILE 1 RECORD 1 28886 BYTES

305

(0)	70D60000	0C1C0000	00010000	0000~~6C93~~	006DDD00	0000EA60	44AC9300	40B5B9EB	C3F31A44	C3E9C99E
(40)	C3DF6A78	C3D409BC	C3C7B567	C3BA7C76	C3AC6ECE	C39D9D2A	C38E1904	C37DF47D	C36D4248	C35C1593
(80)	C34A81F3	C3389B4E	C32675C3	C3142599	C21BF2A7	4310A932	4322FF3B	43352ED7	43472426	4358CB95
(120)	436A11EF	437AE46F	438B30CE	439AE557	43A9F0F4	43B8433F	43C5CC91	43D27E0E	43DE49BA	43E9227E
(160)	43F2FC3E	43FBCBDC	44103875	4410A25A	4410F9F1	44113ED0	441170A1	44118F22	44119A25	44119192
(200)	44117566	441145B3	441102A1	4410AC6E	4410436C	43FC805F	43F3AB89	43E9C17D	43DECCBC	43D2D906
(240)	43C5F355	43B829CE	43A98BB2	439A2952	438A13FE	43795DEF	43681A38	43565CB0	434439D6	4331C6C1
(280)	431F18FF	42C46814	C269A848	C31973B2	C32C2E9A	C33EB4DF	C350F051	C362CB07	C3742F85	C38508CD
(320)	C3954288	C3A4C918	C3B389B8	C3C17297	C3CE72EE	C3DA7B19	C3E57CAD	C3EF6A8B	C3F838F1	C3FFDD8D
(360)	C41064F8	C410B879	C410F7FE	C4112346	C4113A26	C4113C90	C4112A8C	C411043D	C410C9E0	C4107BC7
(400)	C4101A5D	C3FA624D	C3F1FB46	C3E87B7F	C3DDEEED	C3D262AC	C3C5E4E7	C3B884C5	C3AA5254	C39B5E74
(440)	C38BBABE	C37B7970	C36AAD57	C35969B7	C347C23A	C335CAD3	C32397B0	C3113D21	42130789	43139CC4
(480)	4325F37E	43382090	434A101E	435BAE9E	436CE8E7	437DAC3E	438DE670	439D85D9	43AC797A	43BAB102
(520)	43C81CE6	43D4AE68	43E057A8	43EB0BB2	43F4BE8E	43FD6545	4413BA6C	44135810	4412DF53	441250D3
(560)	4411AD49	4410F583	44102A65	43F4CE81	43E5E168	43D5F0DC	43C50FAC	43B3518D	43A0CB06	438D9156
(600)	4379BA5B	43655C7E	43508E99	433B67E0	4325FFCA	43106DF9	C2535DA7	C31AD3FA	C33054C4	C345A0C2
(640)	C35AA0C1	C36F3DE1	C38361B0	C396F639	C3A9E619	C3BC1C96	C3CD85B0	C3DE0E35	C3EDA3D1	C3FC3528
(680)	C4109B1D	C41160AB	C4121318	C412B197	C4133B6F	C413AFFA	C4140EAB	C414570A	C41488B9	C414A370
(720)	C414A702	C414935A	C414687D	C414268B	C413CDBE	C4135E69	C412D8FB	C4123DFB	C4118E0C	C410C9E9
(760)	C3FF264F	C3F086AB	C3E0CFD2	C3D0134A	C3BE63E6	C3ABD5B6	C3987DEF	C38472D1	C36FCB91	C35AA03A
(800)	C3450994	C32F2103	C319006B	C22C20D8	43137F9A	4329A9F4	433FA273	43554EB6	436A94AA	437F5AB1
(840)	439387C1	43A70389	43B9B692	43CB8A60	43DC6990	43EC3FF5	43FAFAB4	44108885	44114D90	4411FDE5
(880)	441298BB	44131D62	44138B47	4413E1F5	44142113	44144866	441457D0	44144F51	44142F07	4413F729
(920)	4413A80E	44134224	4412C5F6	44123428	44118D74	4410D2AD	441004B9	43F24940	43E334B9	43D31FF1
(960)	43C21DD9	43B04243	439DA1D0	438A51D3	4376683D	4361FB85	434D228E	4337F493	4322890B	42CF79AA
(1000)	C28A80CD	C31E3E3A	C333B357	C348EFFD	C35DDD09	C37263B1	C3866D99	C399E4E7	C3ACB456	C3BEC74B
(1040)	C3D009EA	C3E06926	C3EFD2D6	C3FE35C6	C3968BA4	C3B100AF	C3CAA862	C3E365CE	C3FB1D47	C4111B48
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DUMP OF TAPE X-442

chronsc

INPUT TAPE X-442 ON MT4
DATA INPUT H9 FL 1 1 1

Nov 4 1979

44181
Day 1 = -43874
307
days after day

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(1720)	4[illegible]6C39[illegible]6	4[illegible]7F2F35	4[illegible]2925115	40A57767	40B89A1D	4[illegible]CBAC[illegible]C	40DEAD1E	4[illegible]F19[illegible]9A	41104461	41116BE5	
(1760)	41128EA6	4113ABAD	4114C1BD	4115CEAE	4116CD1B	4117A9F5	411815F8	4117A5DC	4116CB86	4115DB72	
(1800)	4114E7C9	4113F55A	411305BA	41121978	41113088	411C4B72	40F6987F	40E8ADA5	40DAF600	40CD74BD	
12 (1840)	4[illegible]C[illegible]5E[illegible]E	4[illegible]B3AFB3	4[illegible]A754EC	409B52A7	408FE6FC	4C851F3D	407B1AD5	4072[illegible]5D1	408E8429	4083[illegible]54E1	
11 (1880)	4[illegible]78DF1B	4[illegible]0F4129	4[illegible]66AA4A	405F785A	405A17E[illegible]	4[illegible]56EDBF	405647AE	4[illegible]584C43	405CE5A[illegible]	4[illegible]63D4C8	
10 (1920)	406CC735	40775EF[illegible]	4083544F	4090[illegible]58E1	409E2B82	4CAC80AA	40BB5EF9	4[illegible]CAA481	40DA28D1	40E9CF73	
9 (1960)	40F990[illegible]3D	4110[illegible]94F3	41118EF1	41128511	41137530	41145CB6	411537B2	4115FECD	4116A2CE	41170798	
8 (2000)	4117[illegible]BFB	4116B[illegible]62	41161581	411557DC	41148[illegible]1	4113A985	4112C1E2	41158DFC	4114FF61	41144EB2	
7 (2040)	4113[illegible]6011	4112AB47	4111C194	411[illegible]CB[illegible]6	40FC942B	4[illegible]FBDE3C	4[illegible]DA9B31	40C8C31E	40B[illegible]741F	4[illegible]A3C550	
6 (2080)	40[illegible]90BCAE	407D30D[illegible]	40[illegible]696320	4055563A	404[illegible]D968	4C2B71E7	4012BBF3	C4270F00	C4270F00	401738EA	
5 (2120)	4[illegible]2ECCF62	4[illegible]7439C3B	40577[illegible]58D	4[illegible]6AB7C3	407D76D4	4C8FA99E	40A1219A	40B1B80F	40C18369	40D085EF	
4 (2160)	4[illegible]DEDAC9	4[illegible]EC6474	4[illegible]F91B[illegible]	411[illegible]5061	4111[illegible]2A1	4111A80C	4138C1BC	41380584	413756DC	4136B2E1	
3 (2200)	4136174F	41358228	4134F1D2	413464D1	4133D9D1	41334F96	4132C4E2	4132387D	4131A913	41311548	
(2240)	413[illegible]7B91	412FDA[illegible]D	412F2EA8	412E76C2	412DAF3C	412CD3E0	412BDF70	412ACAD9	41298C72	4128169E	
(2280)	4126[illegible]58C	41242B4A	41216892	411DBECF	4118A33[illegible]	41111[illegible]C1	40[illegible]09A9B	4217115F	42153691	42135AAF	

(2320)	42121DA2	42116276E	421 EEC5	421 A1E1	421 6B5E	421042AC	421C2306	421 0992	41FF489	41FE2BCD
(2360)	41F03614	41FC5F51	41FB9DE4	41FAEFE6	41FA508F	41F9BCE5	41FC34B6	41FB7816	41FACD2C	41FA302E
(2400)	41F99E6F	41F9159B	41F893D7	41F81794	41F79F6C	41F72A2B	41F6B6B4	41F643FC	41F5D0FD	41F55CAC
(2440)	41F4E5F	41F46B9A	41F3EC5D	41F366AE	41F2D8C6	41F24C77	41F19B26	41F0E5 C	41F 1A11	41EF342B
(2480)	41EE2B32	41ECF3B7	41EB7D05	41E9ADEB	41E75E5D	41E44B46	41DFFCA7	41D98B 3	41CF1771	41BCDAA0
(2520)	419EC0FF	417C9C67	416506CD	41574EDE	414EFFD6	4197DFE6	41772043	4161D0DD	41556EAA	4140D19D
(2560)	4148C10B	41452771	4142749D	414 5687	413EA3A9	413D3844	413C02B8	413AF5B	413A07A1	413931A6
(2600)	41386E9A	4137BA68	4137124A	413 7358	4135DB9F	41354962	4134BB1B	41342F63	4133A4EE	41331A8B
(2640)	41328EFC	41320106	41316F48	4130D840	41303A48	412F935E	412EE124	412E20B	412D4E58	412C655B
(2680)	412B5F80	412A345E	4128D840	41273A48	C0C085AA	CCA74DAC	C08B4025	C06C56E4	C04ACF3D	C0273750
(2720)	BF20A154	40228E04	4046A648	4069025D	4089 0C2	40A68CEB	40C16FD9	40D9DA7D	40F003BC	411 42BC
(2760)	41116957	4112781D	411372DE	41145CEA	411538C3	41160793	4116C804	41772F	4117F3B6	4118 C3D
(2800)	4117B938	411733C3	4116ADA2	41160C28	41157A3A	4114EB9E	41145FC2	4113D588	41134BC6	4112C1A5
(2840)	411236B5	4111AADD	41111E15	411 8FFD	40FFF7E1	40F6A75F	40ECDA6D	40E24CB6	40D6AE63	40C9A96B
(2880)	40BAE5F9	40AAOFBF	4096DB6F	40811368	40B22947	40AC5B7B	408C8389	40766879	405DF5 B	4043450O
(2920)	4026AE1C	3F68BBCA3	C015DE1F	C0345EDC	C052160E	CC6E78BD	C0892BD5	CCA2039F	C0B8FAF1	CCCE2882
(2960)	CCE1B4D6	C0F3D16A	C1104B1A	C1114851	C1123733	C113198D	C113F064	C114BBF0	C1157BA8	C1162E54
(3000)	C116D21F	C11764AE	C117E303	C1184PC2	C1188DA5	C118A532	C11893D2	C1187071	C118467E	C1181688
(3040)	C117DD0E	C117956E	C1173B5A	C1183453	C1182E6	C118072B	C117BCAD	C1175312	C116CF37	C11634A8
(3080)	C1158595	C114C2E6	C113EC2D	C112FF8F						

FILE 1 RECORD 1551 LENGTH 3 96BYTES

(0)	00FFD003	0000AC95	2409A160	0000EA60	44AC910C	4CA883B2	44123F64	44120BA1	4411C378	4411672A
(40)	4410F711	44107396	43FDD58D	43F34DDA	43E7AE17	43DB02DC	43CD5A0B	43BEC2CA	43AF4D66	439F0B61
(80)	438E0F29	437C6C3A	436A36EC	4357846	43446A67	4330FF6A	431D5A4B	429924A7	C2A41191	C31E083D
(120)	C331AB7B	C345134A	C3582859	C36AD3B1	C37CFED6	C38E93E0	C39F7D9C	C3AFA7AC	C3BEFE9C	C3CD7004
(160)	C3DAEA9C	C3E75E55	C3F2BC70	C3FCF791	C410603C	C41CDD6C	C4114679	C4119AEF	C411DA76	C41204CE
(200)	C41219D1	C4121974	C4123C7	C411D8F3	C411993B	C41144FA	C410DCA3	C41060C0	C3FD1F35	C3F30EFF
(240)	C3E7E8 0	C3DBB7F5	C3CE8DB1	C3C 7905	C3B18AAF	C3A1D440	C39168CA	C3805904	C36EBABB	C35CA136
(280)	C34A20E2	C3374E80	C3243F0B	C31107A5	422427DE	43158A29	4328BA40	433BBDCD	434E8015	436 ECAC
(320)	4372EF87	4384750C	43956A27	43A3BC57	43B559C2	43C43144	43D23282	43DF4DF5	43EB74FF	43F699F5
(360)	441 0B03	441 9AC2	44111835	441182C7	4411D9F8	44121D5B	44124C98	4412676D	44126DAD	44125F43
(400)	44123C2F	4412048B	4411B884	44115861	4410F481	440C5D58	43FC372F	43F17728	43E5A0FE	43D8C18B
(440)	43CAE6F5	43BC209E	43AC7F18	439C140D	438AF233	43752D33	4366D993	4354 C9C	434 DC47	432D5F19
(480)	4319AC11	425DA83E	C2DFE 5	C321C5CE	C335653C	C348C4C1	C35BCD14	C36E674D	C3807D03	C391F869
(520)	C3A2C46B	C3B2CCD1	C3C1FE54	C3D 46BA	C3DD94F	C3E9D922	C3F504D	C3FF ADC	C410 7DFA	C410F790
(560)	C4115CE7	C411AD9	C411E936	C4120F9E	C41220A8	C4121C4E	C41202A4	C411D3D9	C4119033	C4113813
(600)	C410CBF	C414C59	C3FB9F39	C3F15773	C3E5FB1A	C3D99820	C3CC3D8E	C3BDFB65	C3AEE28D	C39F04C1
(640)	C38E7476	C37D44C6	C36B8959	C359564F	C346C 2E	C333DBC7	C320BE22	C2D7C6C5	425D41EA	43191E48
(680)	432C4CF3	433F4B2E	43F4FB4E	441 1D11	441 D730	44117D3F	44120E81	44128A56	4412F039	44133FBF
(720)	4413789A	44139A99	4413A5A5	441399C5	44137719	44133DDC	4412EE66	44128925	44120EA2	44117F7B
(760)	441 DC67	441 2630	43F5DB67	43E83EAF	43D99D18	43CAC7D9	43B99119	43A84BD7	43964BD1	4383A571
(800)	437 6DB9	435CBA26	4343ADA4	4334376F	431F9506	42ADC0F8	C2A00B8F	C31EC696	C3336AE1	C3470719
(840)	C35BF4FD	C36FAE9C	C382EE6A	C3959F55	C3A7ACD6	C3B903C9	C3C98EBA	C3D93D8C	C3E7FDC6	C3F5BEE9
(880)	C4102713	C410E362	C4118704	C4121A33	C412993F	C413038E	C413589A	C41397F4	C413C144	C413D44D
(920)	C413D3E6	C413B703	C41386AF	C4134011	C412E368	C4127100	C411E973	C4114D28	C4109CD1	C3FD92C6
(960)	C3F030FF	C3E1B698	C3D233CA	C3C1BA22	C3B05C6C	C39E2F9E	C38B45C1	C377B7D9	C3639BCB	C34F093E
(1000)	C33A1864	C324E273	C2F804CB	425F465E	431B61F4	433CAEAB	4345C0F2	435A7F73	436ED136	43829DCC
(1040)	4395CD66	43A848FD	43B9FA6F	43CACC9B	43DAAB81	43E98459	43F745B1	44103DF7	4410F433	4411963C
(1080)	4412235F	44129AFE	4412FC9A	441347CF	44137C54	441399FC	4413A0B6	4413908E	441369A9	44132C48
(1120)	4412D8C7	44126F98	4411F149	44115E7C	4410B7EC	43FFE66F	43F32CEC	43E5618E	43D694B7	43C6D7C9
(1160)	43B63D10	43A4D7AA	4392BB71	437FFCE8	436CB123	4358EDB1	4344C887	43305 EC	431BB25E	426EE872
(1200)	430D864E	43C4B7DB	43AAFDE1	439 7787	437544DC	4359869D	433D5E10	4320ECD1	42454AB9	C3184899
(1240)	C354C962	C3510C69	C36CF ED	C3856D2	C3A31ECB	C3BD2A7C	C3D65C9A	C3EE9909	C4105C4F	C411BC70
12 (1280)	C4130875	C4143EF6	C4155EAA	C4166660	C4175503	C4182990	C418E354	C419816C	C41AC348	C41A6867
11 (1320)	C41AD06B	C41ADB11	C41AE837	C41AD7D9	C41AAA11	C41A5F18	C419F746	C4197310	C418D3C6	C41817D8
10 (1360)	C4174257	C4165354	C4154BE6	C4142D1F	C412F833	C411AE6F	C4105133	C3EE1F9D	C3D624E5	C3BD3D10
9 (1400)	C3A3833A	C3891378	C36E0AE3	C352873D	C336A7CF	C31A8970	421B2178	431DEBB0	433A0354	4355D8F0
8 (1440)	43714C8D	438C3E71	43A68F48	43C 2045	43D8D34F	43FC8B1E	44107286	4411C990	44130BA1	44143761
7 (1480)	44154B61	44164640	4417726D	4417EC27	441895 3	4419200A7	44198E5E	4419DD99	441A0DEA	441A1F0B
6 (1520)	441A1 DC	4419E363	44199CCF	44192B74	4418A1CC	4417FA79	44173641	441656 E	44155AF0	44144614
5 (1560)	44131CCC	4411D485	4410 7ACB	43F D428	43D DA7D	43BFDCDD	43A5F99D	438B5016	43700079	43542B9F
4 (1600)	4337F2E2	431B77EA	C21237CF	C31DBD91	C33A34C6	C35667EF	C3723666	C38D8039	C3A82647	C3C20A67
3 (1640)	C3DB 8A	C3E319D3	C41 AFEB	C411FD51	C4134555	C4147796	C41592CE	C41695D2	C4177E93	C4184E1E
(1680)	C419C3A3	C419 C08	C41A18D6	C41A7874	C41ABAE7	C41ADFF4	C41AE77E	C41AD187	406CC34D	405919C0
(1720)	4044AD23	402EAF18	4012CF76	C427CF00	C427CF C	C427CFC0	40151540	4030CE4C	4047631C	40C9AB1

MAGSAT

MAGSAT ORBIT RET SUBROUTINE, TAPE

79-094A-01C,02C SPMS-00108

THESE DATA SETS HAVE BEEN RESTORED. ORIGINALLY THERE WAS ONE 9-TRACK, 1600 BPI TAPE WRITTEN IN EBCDIC. THERE IS ONE RESTORED TAPE WRITTEN IN ASCII. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 360 COMPUTER AND WAS RESTORED ON THE MRS SYSTEM. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER IS AS FOLLOWS:

DR#	DS#	D#	FILES
DR004658	DS004658	D038184	1

MAGSAT

PURDUE MAG FIELD ROUTINES, TAPE

79-094A-01D/02D SPMS-00177

This data set has been restored. There was originally one 7-track, 800 BPI tape written in BCD. There is one restored tape written in ASCII. The DR tape is a 3480 cartridge and the DS tape is 9-track, 6250 BPI. The original tape was created on an IBM 360 computer and the restored tape was created on an IBM 9021 computer. The DR and DS numbers along with the corresponding D number are as follows:

DR#	DS#	D#	FILES
DR004368	DS004368	D038185	3

REQ. AGENT	RAND #	ACQ. AGENT
DEW	V0105	HKH

MAGSAT

ORBIT RET. SUBROUTINE

PURDUE PROGRAM AND DATA TAPE

79-094A-01C/02C

79-094A-01D/02D

79-094A-01C/02C

THIS TAPE IS 9-TRACK, 1600 BPI, EBCDIC, AND CONTAINS 1 FILE. THE TAPE WAS CREATED ON AN CDC COMPUTER. DOCUMENTATION: "MAGSAT ORBIT RETRIEVAL SUBROUTINES SOURCE LISTINGS" B32936-000A DLO=A! HCK=D! THE D AND C NUMBERS FOLLOW:

D#	C#
D-38184	C-20964

79-094A-01D/02D

THIS TAPE IS 7-TRACK, 800 BPI, BCD, AND CONTAINS 3 FILES. THE TAPE WAS CREATED ON AN CDC COMPUTER. THE D AND C NUMBERS FOLLOW:

D#	C#
D-38185	C-20965

79-094A-01C, 02C
(1st page of TRF B32936-000A)

MAGSAT ORBIT RETRIEVAL SUBROUTINES

A set of routines has been prepared to permit retrieval of orbit data from orbit records on CHRONICLE tapes.

These routines assume that the most recent orbit record encountered on the CHRONICLE tape resides in COMMON /ORBCRN/. The satellite position in cartesian (x, y, and z in kilometers) geographic (latitude and longitude in degrees and altitude in kilometers) or geomagnetic coordinates (invariant latitude in degrees, magnetic local time in hours, and dip latitude in degrees) may be obtained by calling subroutine FLDORB, specifying the time as modified Julian Day and milliseconds of day. This is the same format in which time is specified in the CHRONICLE data records.

Subroutine FLDORB also returns a field value estimate from a field model. The four field parameters are total field and x, y and z components in gammas.

An additional routine, CONDAT, is provided to facilitate conversions from calendar date to modified Julian Day and vice versa.

Additional information may be obtained from the self-documenting prologues in the source code listings.

MGINV4 performs the final stage of the inversion process which calculates the unknown sources.

MODELG calculates the gravitational field on the gridded region of a sphere due to a spherical distribution of single point sources.

MODELM calculates the magnetic field on the gridded region of a sphere due to a spherical distribution of dipole sources.

PLTCON2 uses the CALCOMP plotter or VERSATEC electrostatic printer to contour data matrices in an equal-area, stereographic polar projection.

79-044M-01D,02D

3/19/80

Program and Data Tape from Purdue University

A catalog listing summarizing the contents of the three files that are included on the magnetic tape that was produced on the CDC computer at Purdue University is given here as Attachment 1.

The first file on the tape contains updated versions of the various processing programs that were included in Volume 2 of the report written in 1978 References 1 and 2 . In addition to the updated versions of the programs, a few of the program names were changed after the original report was written. It is thought that this should not cause a problem since the purpose of the programs is included with the self-documented code.

The second file on the tape includes data used in preparation of selected figures of the 1978 report.

The third file on the tape contains the program for computing the gravity and magnetic anomaly fields of non-idealized shaped sources within the spherical earth.

A sheet concerning 'Transferring Magnetic Tapes Between Computer Installations' that accompanied the latest tape from Purdue is given as Attachment 2.

Additional descriptive information concerning the package of programs on file 1 of the tape is included as Attachment 3. This attachment gives the program names and a brief description of the various program functions.

References

1. Bowman, P. L., L. W. Braile, Val W. Chandler, W. J. Hinze, A. J. Luca, and Ralph R. B. von Frese, Magnetic and Gravity Anomaly Correlation and Its Application to Satellite Data, Department of Geosciences, Purdue University, West Lafayette, Indiana, August 1978.

2. _____, Volume 2, Computer Codes, August 1978.

NASA/GSFC TM79702, JAN. 1979

Attachment 1

CATALOG OF TAPE FILE 1 02/05/80. 11.11.14. PAGE 1

REC	NAME	TYPE	LENGTH	SECTORS	CKSUM	DATE	COMMENTS
1	P	TEXT	4446B	37	2055		PROGRAM BANDPS (INPUT,OUTPUT,PUNCH,TAPE1,TAPE7=PUNCH,TAPE5=INPUT,T
2	P	TEXT	1430B	13	4676		PROGRAM DERIVA(INPUT,OUTPUT,PUNCH,TAPE7=PUNCH,TAPE5=INPUT,
3	P	TEXT	2337B	20	2566		PROGRAM MAGPOL(INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7=
4	P	TEXT	4163B	34	4641		PROGRAM UPCON (INPUT,OUTPUT,PUNCH,TAPE1,TAPE7=PUNCH,TAPE5=INPUT,TA
5	P	TEXT	4476B	37	1536		PROGRAM STRASS (INPUT,OUTPUT,PUNCH,TAPE1,TAPE7=PUNCH,TAPE5=INPUT,T
6	P	TEXT	1475B	13	5565		PROGRAM MPOILG (INPUT,OUTPUT,TAPE7,TAPE1,TAPE2,TAPE3,TAPE5=INPUT,T
7	P	TEXT	617B	7	2665		PROGRAM BLOCK (INPUT,OUTPUT,PUNCH,TAPE1,TAPE8,TAPE5=INPUT,TAPE6=OU
8	P	TEXT	4135B	34	1464		PROGRAM MAPVAR (INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7=
9	P	TEXT	2251B	19	3241		PROGRAM CLUSTR (INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7=
10	P	TEXT	316B	4	4552		PROGRAM SKUZZ (INPUT,OUTPUT,PLOT,TAPE5=INPUT,TAPE6=OUTPUT)
11	P	TEXT	4550B	38	0202		PROGRAM PROVAR(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT)
12	P	TEXT	5560B	46	2060		PROGRAM MGINV1(INPUT,OUTPUT,MATRIX1,MATRIX2,YDATA,
13	P	TEXT	714B	8	2132		PROGRAM MGINV2(OUTPUT,MATRIX1,MATRIX2,ATRANSA,YDATA,TAPE1=
14	P	TEXT	2234B	19	6500		PROGRAM MGINV3(OUTPUT,ATRANSA,YDATA,EIGENS,VMATRIX,TAPE12=
15	P	TEXT	1274B	11	2353		PROGRAM MGINV4(INPUT,OUTPUT,PUNCH,MATRIX1,VMATRIX,YDATA,EIGENS,
16	P	TEXT	4253B	35	4542		PROGRAM MODELM(INPUT,OUTPUT,PUNCH,TAPE10,TAPE5=INPUT,
17	P	TEXT	2245B	19	4511		PROGRAM MODELG(INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE6=
18	P	TEXT	4147B	34	6370		PROGRAM PLTCON2.(INPUT,OUTPUT,PLOT,TAPE5=INPUT,TAPE6=OUTPUT,PUNCH)
19	* EOF *	SUM =	64441B	429			

LENGTH OF THIS FILE IN FEET: 33

CATALOG OF TAPE FILE 2 02/05/80. 11.11.14.

REC	NAME	TYPE	LENGTH	SECTORS	CKSUM	DATE	COMMENTS
1	C	TEXT	13343B	92	5571	C	FIGURE D-1
2	C	TEXT	13107B	90	0445	C	FIGURE D-4
3	C	TEXT	2631B	23	5617	C	FIGURE D-9
4	C	TEXT	6717B	56	2177	C	FIGURE D-6
5	C	TEXT	2635B	23	4222	C	FIGURE D-10
6	C	TEXT	2632B	23	7151	C	FIGURE D-11
7	C	TEXT	1771B	16	3316	C	FIGURE D-12
8	C	TEXT	1771B	16	3316	C	FIGURE D-12
9	C	TEXT	1770B	16	1256	C	FIGURE D-13
10	C	TEXT	1351B	12	4044	C	FIGURE D-14
11	C	TEXT	1352B	12	3637	C	FIGURE D-17
12	ORIGINA	TEXT	13341B	92	7017		ORIGINAL NASA 1-DEG AVGD GRAV DATA (Z=0.0 KM), (-40,60-CI=10), BNDPS=0.,2
13	ORIGINA	TEXT	13337B	92	6452		ORIGINAL NASA 1-DEG AVGD ELEVATIONS (-6000,3000-CI=300 M)
14	* EOF *	SUM =	105506B	564			

LENGTH OF THIS FILE IN FEET: 43

CATALOG OF TAPE FILE 3 02/05/80. 11.11.14.

REC	NAME	TYPE	LENGTH	SECTORS	CKSUM	DATE	COMMENTS
1	P	TEXT	50607B	327	3362		PROGRAM SPHERE (INPUT,OUTPUT,GAUSS,FIELD,IGRF,TAPE10,TAPE5=INPUT,T
2	GAUSS -	TEXT	251B	3	5563		GAUSS -------THIS LINE MUST BE DELETED BEFORE USING WITH SPHERE
3	00 1965	TEXT	422B	5	3004		00 1965, IGRF COEFFICIENTS

Attachment 2

6. Transferring Magnetic Tapes Between Computer Installations

Since magnetic tape provides a compact medium for storing information in an easily portable form, it is frequently used as the medium for transferring information (e.g., programs and/or data) between computer installations. On the surface this appears safe, but in reality there are problems involved because of differences in: (a) number of recording tracks, (b) selections of recording densities, (c) representation of characters, (d) length of physical records, (e) tape labelling, and (f) various other strange things. In order to minimize the problems in magnetic tape interchange, observe the following recommendations if possible or unless you know otherwise:

(1) Use 9-track, half-inch magnetic tape at a recording density of 6250 bpi.
(2) Use external ASCII format.
(3) Don't block the tape.
(4) Send a description of the tape including:
    (a) Manufacturer and model number of the source computer;
    (b) The number of tape reels sent;
    (c) The number of tracks on each reel; 9
    (d) The recording density of each reel (in bpi); 6250
    (e) The number of logical files (or file marks) on each reel; FILE #
    (f) The parity of each logical file; (?) ODD
    (g) The number of physical records in each logical file; Rec-see catalog
    (h) The blocking factor;
    (i) The maximum number of characters per physical record; 80
    (j) The number of bits per character or byte.
(5) Send a listing of at least the first 250 unit records (line images, etc.) of each file.
(6) Send a table describing the character code used to write the tape.
(7) Place an informative tape label on each tape reel.

It is not always possible to follow all of the above recommendations but it is not within the scope of this document to discuss all the problems that can arise when tapes are transferred between computer installations. The reader is referred to PUCC document ZO-CNVRTAP for more complete information about interchanging information between computer installations on magnetic tape.

Attachment 3 (1 of 2)

Program Names and Descriptions

Brief descriptions for the processing programs on file 1 of the tape furnished by Purdue University are given below.

BANDPS performs bandpass filtering on uniformly gridded one or two dimensional data sets.

DERIVA performs Nth order vertical or horizontal differentiation of uniformly gridded one or two dimensional data sets.

MAGPOL reduces to vertical polarization uniformly gridded one or two dimensional magnetic data sets.

UPCON performs upward or downward continuation on uniformly gridded one or two dimensional data sets.

STRASS performs strike-sensitive filtering on uniformly gridded two dimensional data sets.

MPOILG performs internal correspondence analysis (ICA) on uniform two dimensional magnetic data reduced to the pole and the first vertical derivative of gravity.

BLOCK plots two dimensional ICA results as line printer contour maps.

MAPVAR performs initial stage of cluster analysis which divides uniform two dimensional data spaces into square subareas and calculates up to 18 statistical and vector characteristics for each subarea.

CLUSTER performs the final stage of cluster analysis which clusters the two dimensional gravity and magnetic variables calculated by program MAPVAR.

SKUZZ plots the two dimensional clustering results using the CALCOMP plotter or VERSATEC electrostatic printer as plotter devices.

PROVAR calculates up to 14 statistical and vectorial characteristics of uniformly gridded one dimensional gravity and magnetic profiles and performs the cluster analysis.

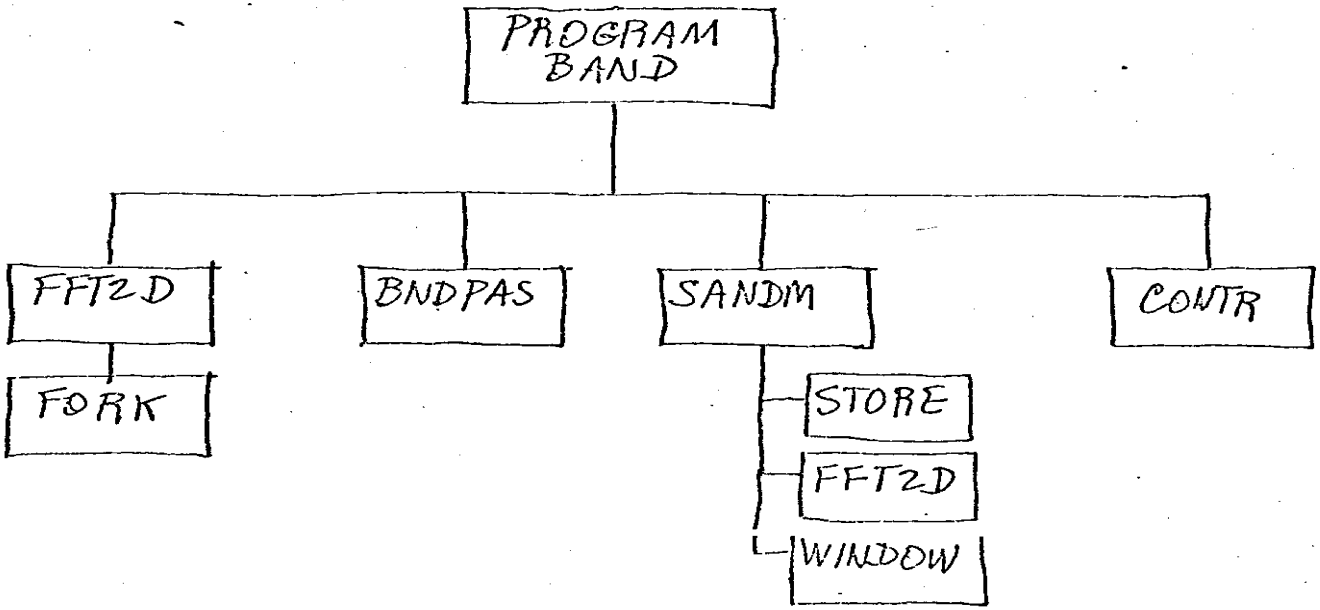
MGINV1 performs the first stage of the inversion process which reads the magnetic or gravity field data and calculates the matrix A.

MGINV2 performs the second stage of the inversion process which calculates the product A^T*A and writes it onto file ATRANSA.

MGINV3 performs the third state of the inversion process which determines the eigenvalues of matrix A and writes them onto file EIGEN.

Fig 1

E- 3. . . . . BAND performs high-cut, low-cut or bandpass filtering in the frequency domain of uniformly gridded one or two dimensional data sets.



Compiler Errors

1 level 8
Data initialization syntax error in subroutine CONTR
2 level 4 — word size
2 level 4 — equivalence

E11 . . . CONTR2 generates line printer contour maps of gridded data input in successive west to east rows, starting in the southwest corner.

PROGRAM CONTR2

(Single routine)

E-36. . . . . BLOCK plots two dimensional ICA results as line printer contour maps. File 2

PROGRAM BLOCK

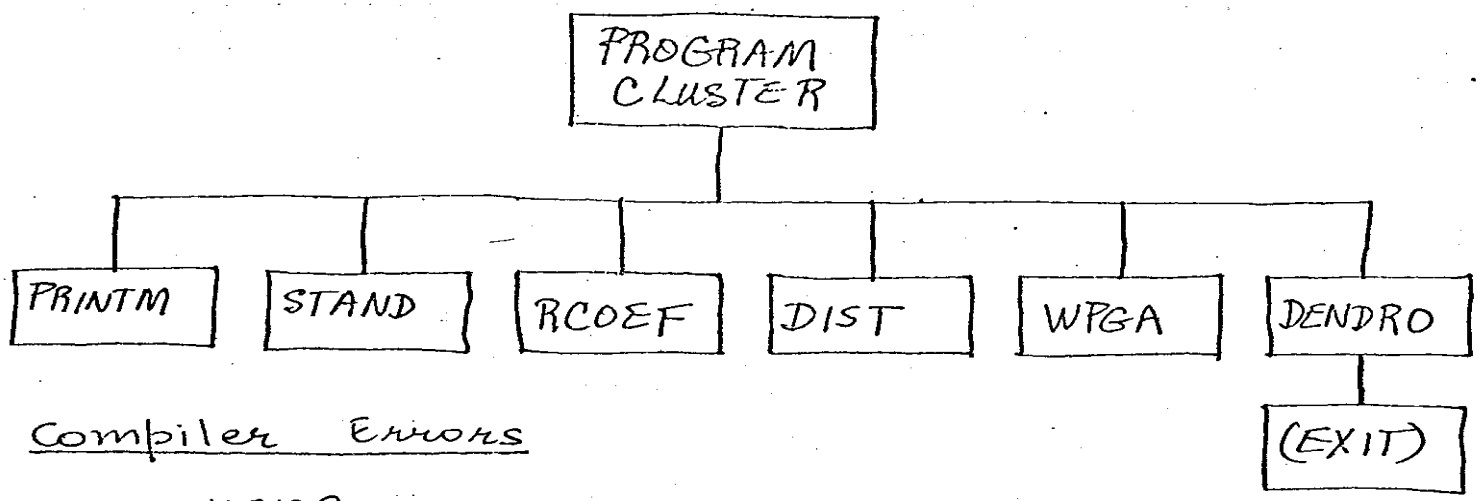
(Single routine)

Compiler Errors

1 level 8 - data initialization
1 level 8 - 1b - (EOF) end of file unit?

File 3

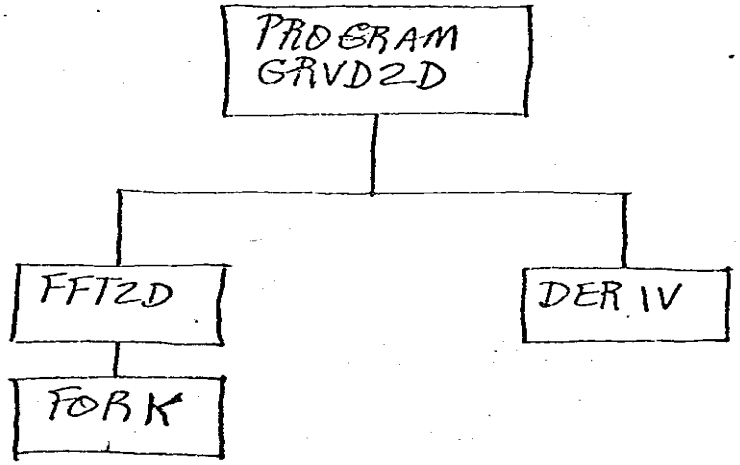
E-45. . . . . CLUSTER performs the final stage of cluster analysis which clusters the two dimensional gravity and magnetic variables calculated by program MAPVAR.



Compiler Errors

none

E- 9. . . . . GRAV2D performs Nth order vertical or horizontal differentiation in the frequency domain of uniformly gridded one or two dimensional data sets. F.64

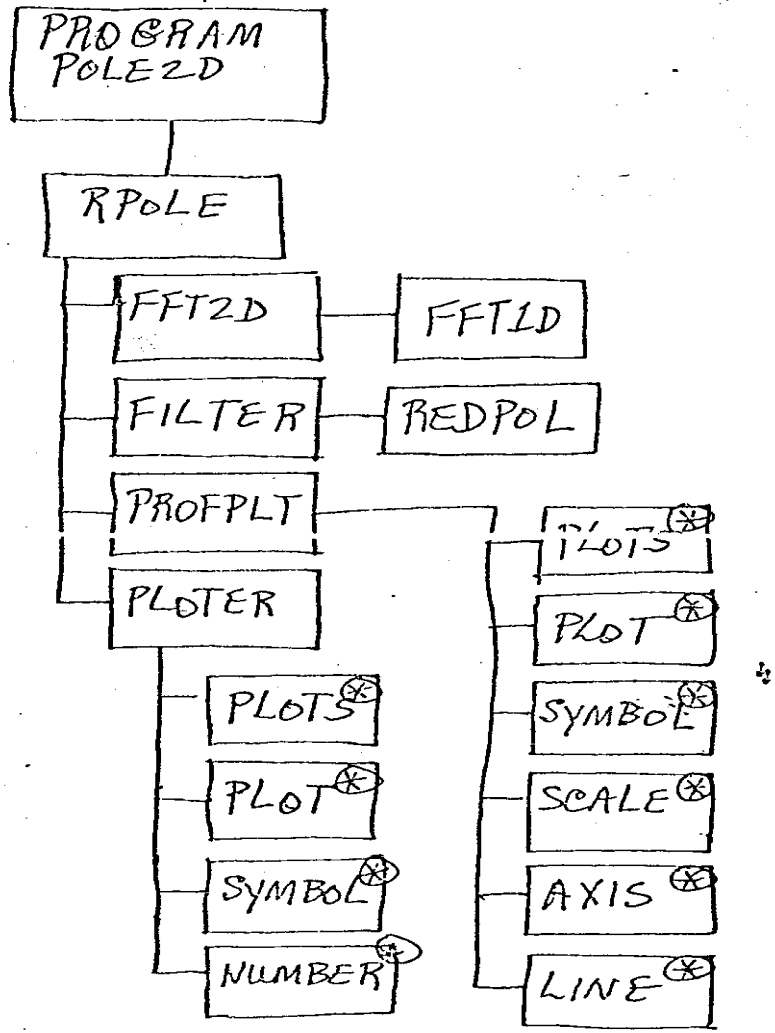


Compiler Errors

2 level 4 word size
25 level 04 variable longer than 6 characters
8 level 4 - skipping write statements

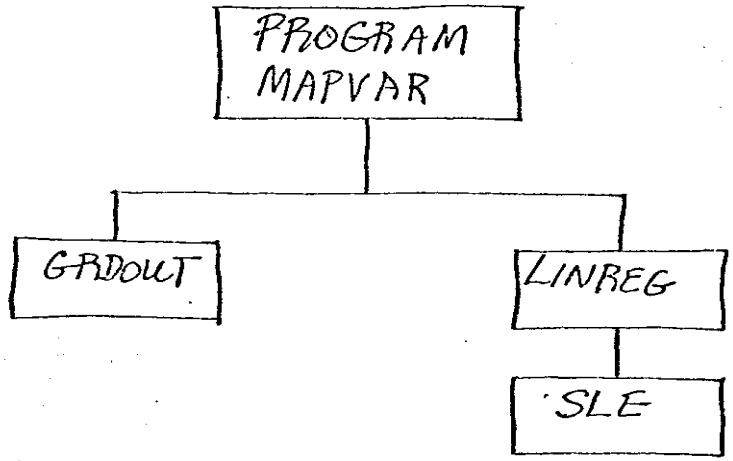
Fig 5

E-13. . . . . POLE2D reduces to vertical polarization uniformly gridded one or two dimensional magnetic data sets in the frequency domain.



⊛ CALCOMP routines

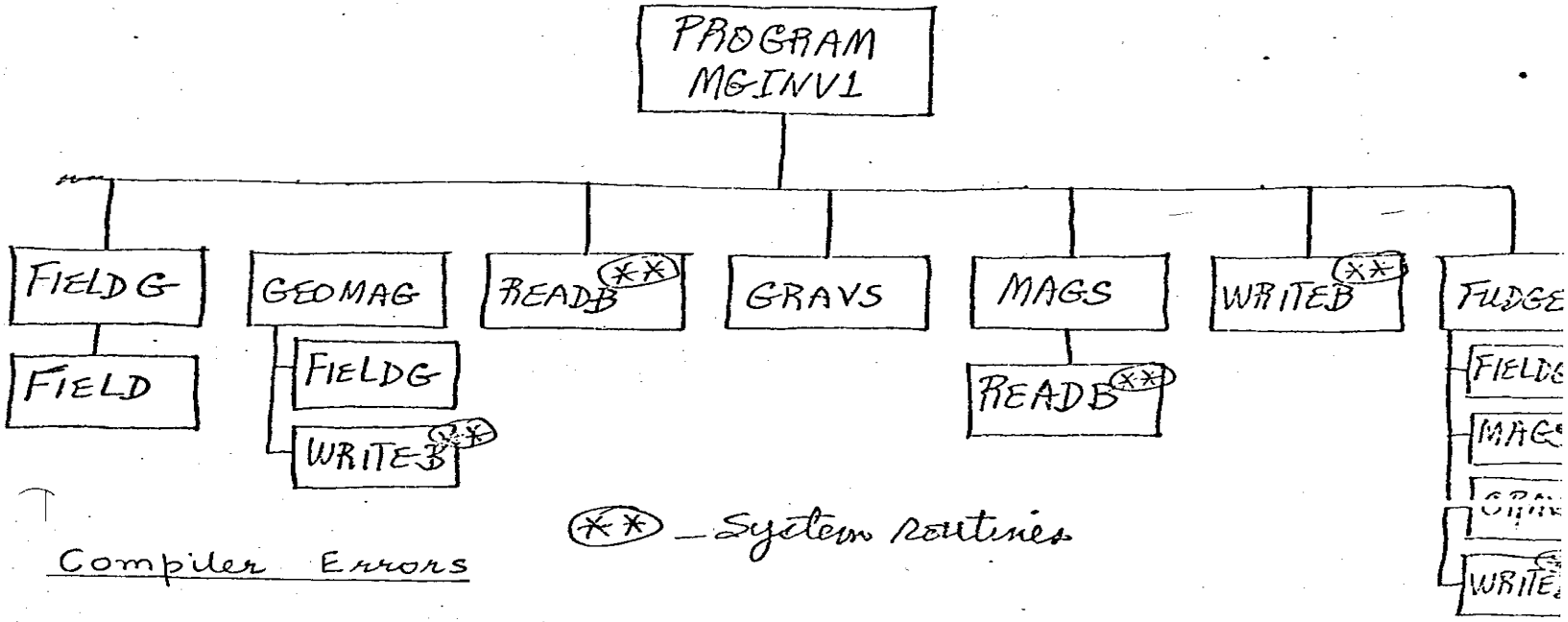
E-38. . . . . MAPVAR performs initial stage of cluster analysis which divides uniform two dimensional magnetic and gravity data spaces into square subareas and calculates up to 18 statistical and vector characteristics for each subarea.



Compiler Errors

none

E-61. . . . . MGINV1 performs the first stage of the inversion process which reads the magnetic or gravity field data and calculates the matrix A.

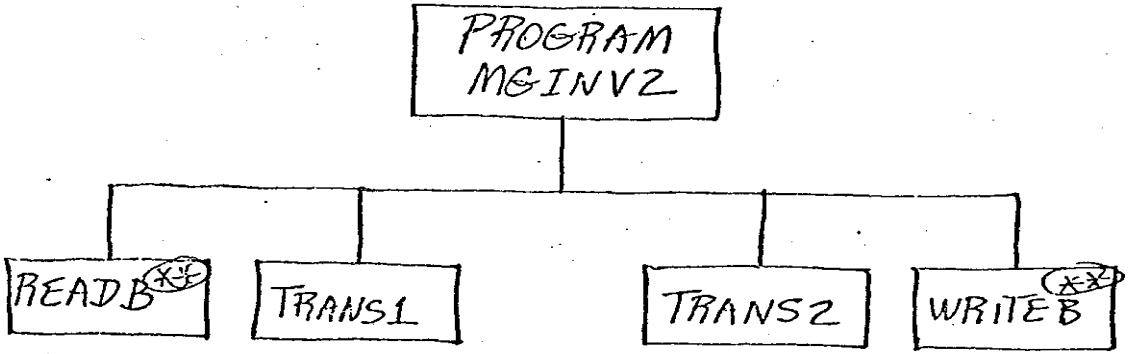


Compiler Errors

4 level 4 — word size

File 8

E-71. . . . . MGINV2 performs the second stage of the inversion process which calculates the product A^T*A and writes it onto file ATRANSA.



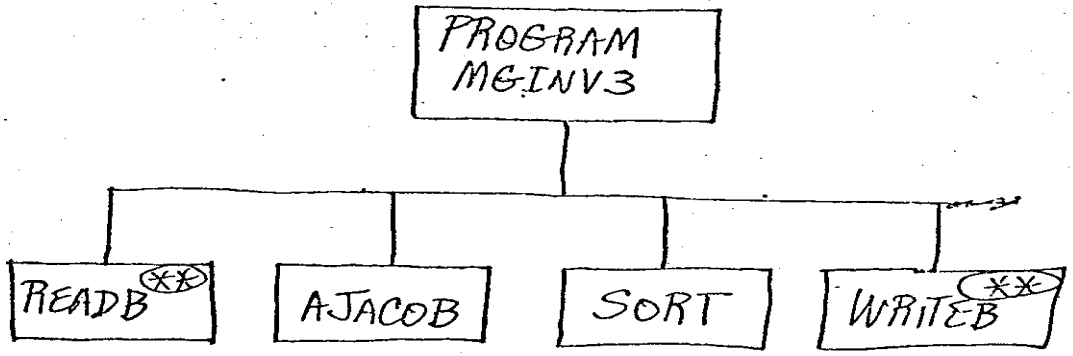
(**) System routines

Compiler Errors

no Errors

E-73. . . . . MGINV3 performs the third state of the inversion process which determines the eigenvalues of matrix A and writes them onto file EIGEN.

File 9



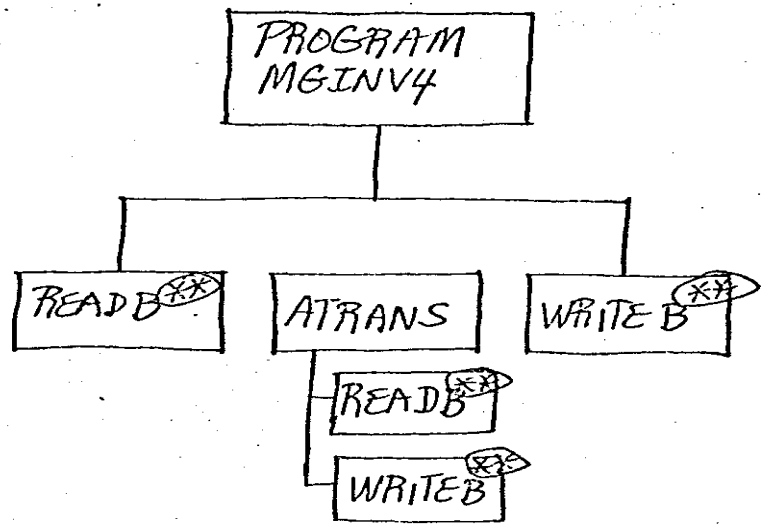
(**) System Routine(s)

Compiler Errors

1	level	8	data initialization
3	level	4	word size Error

E-78. . . . . MGINV4 performs the final stage of the inversion process which calculates the unknown sources.

File 10

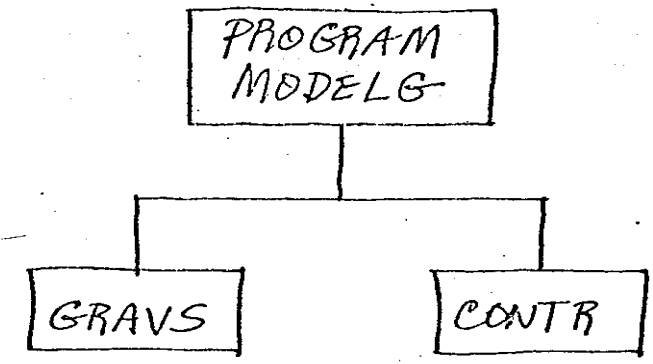


(**) System routine

Compiler Errors

1 level 4 word size

E-81. . . . . MODELG calculates the radial component of the gravitational field on the gridded region of a sphere due to a spherical distribution of single point masses. File 11

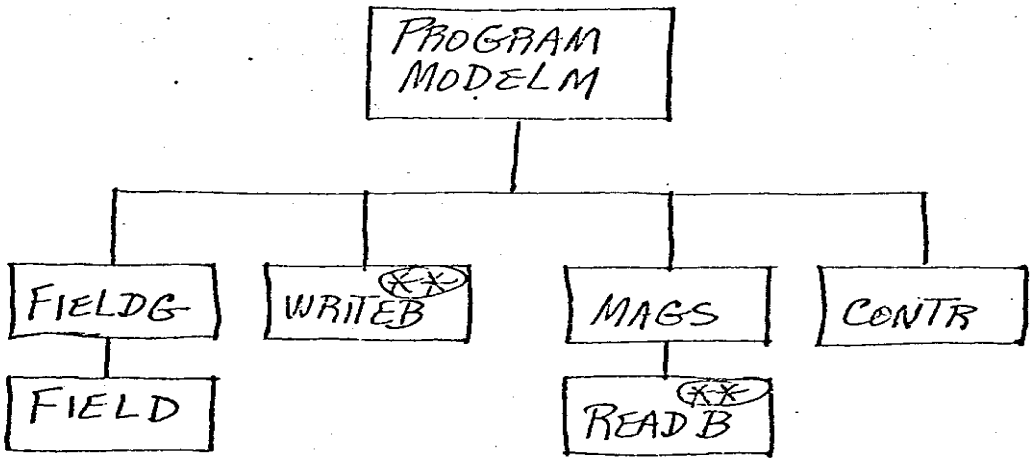


Compiler Errors

1	level	8	data intialization
1	level	4	word size

File 12

E-86. . . . . MODELM calculates the total magnetic field on the gridded region of a sphere due to a spherical distribution of dipole sources. This program also differentially reduces equivalent source magnetic fields to radial polarization.

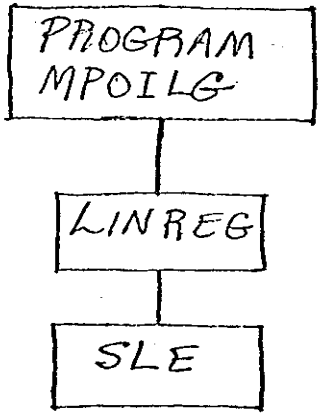


Compiler Errors

3	level	4	wordsize
1	level	8	data initialization

File 13

E-32. . . . . MPOILG performs internal correspondence analysis (ICA) between the uniform two dimensional magnetic data reduced to the pole and the first vertical derivative of gravity.

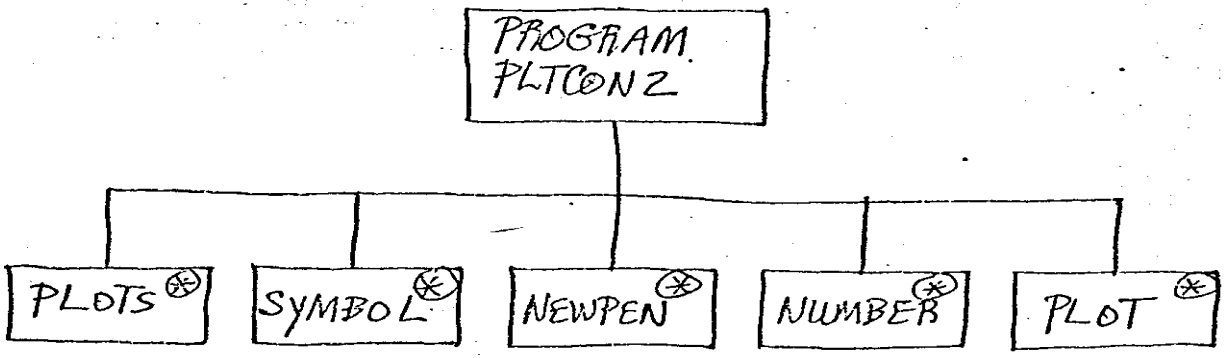


Compiler Errors

1 level 4 - word size

File 14

E-94. . . . . PLTCON2 uses the CALCOMP plotter or VERSATEC electrostatic printer to contour data matrices in an equal-area, stereographic polar projection.

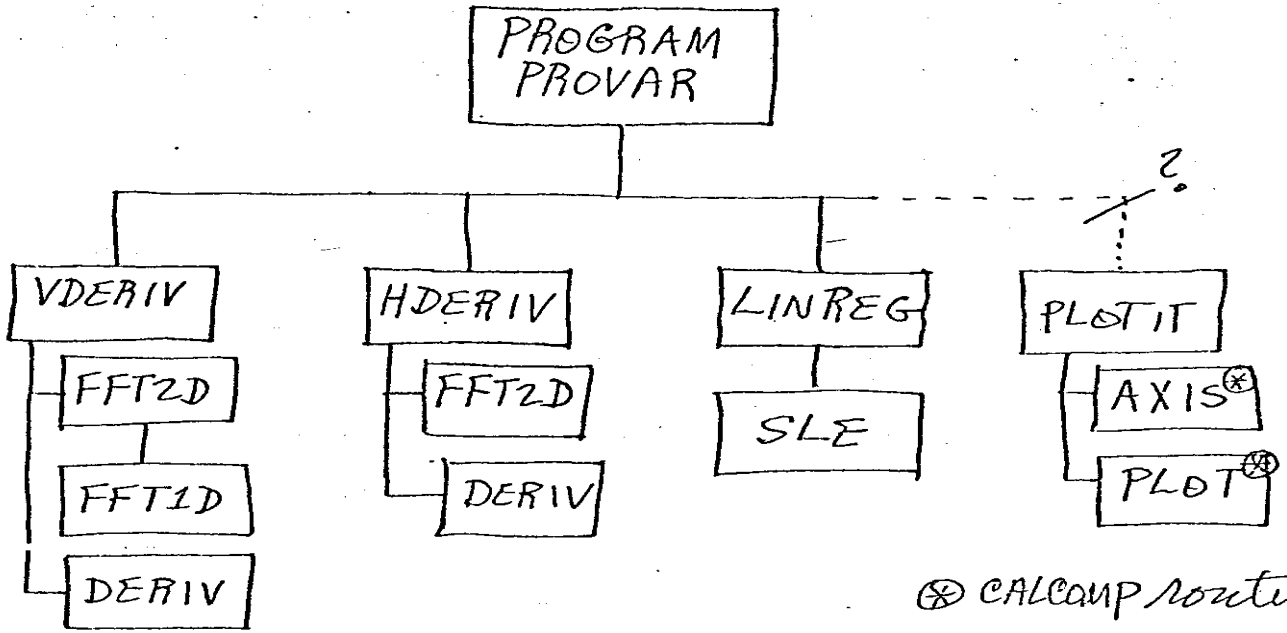


⊛ CALCOMP routine

Compiler Errors

2	level	4	word size
1	level	4	due to 1 level 8
1	level	8	- 1/5 (EOF) end of file on unit code ?
1	level	8	— double = signs

E-52. . . . . PROVAR calculates up to 14 statistical and vectorial characteristics of uniformly gridded one dimensional gravity and magnetic profiles and performs the cluster analysis.



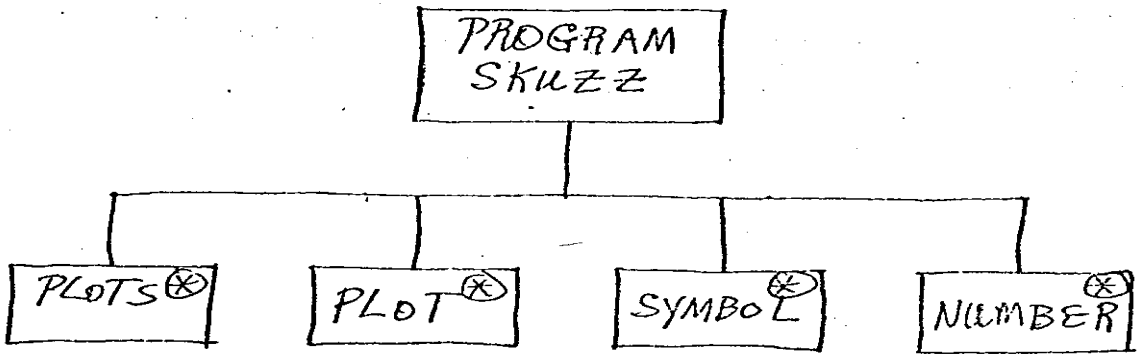
⊗ CALCOMP routines

Compiler Errors

2 level 4 word size

E-51. . . . . SKUZZ plots the two dimensional clustering results using the CALCOMP plotter or VERSATEC electrostatic printer as plotting devices.

File 6



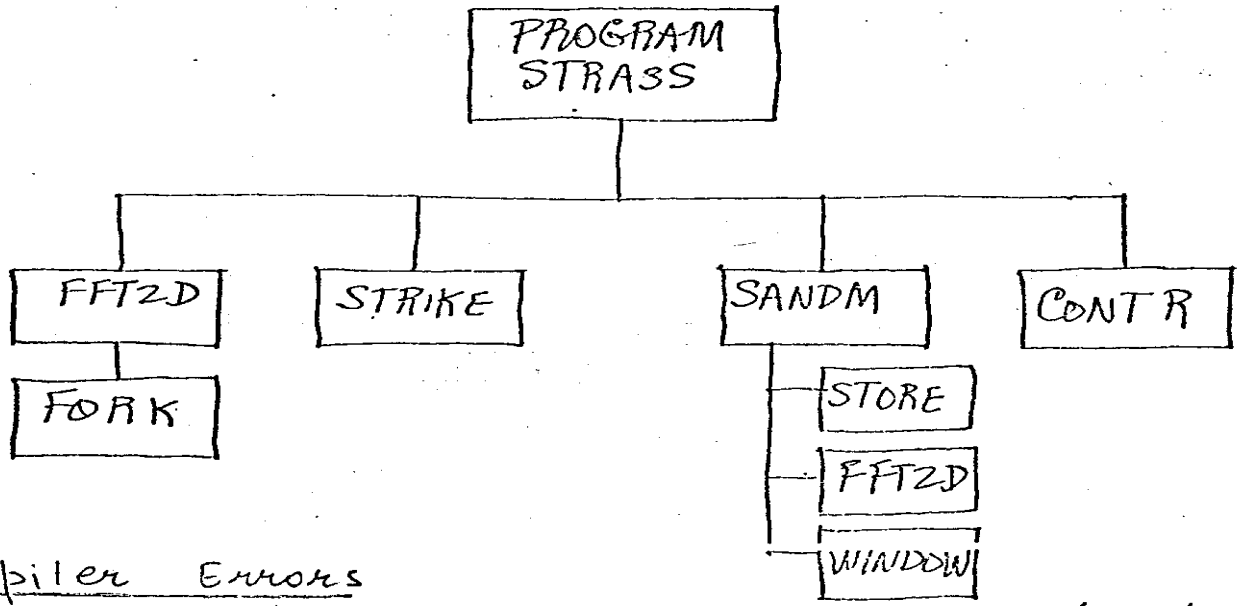
⊛ CALCOMP Routines

Compiler Errors.

4 level 4 — variable name longer that 6 characters
3 level 8 — DO loop delimeter invalid
can be fixed

File 18

E-25. . . . . STRASS performs strike-sensitive filtering in the frequency domain of uniformly gridded two dimensional data sets.

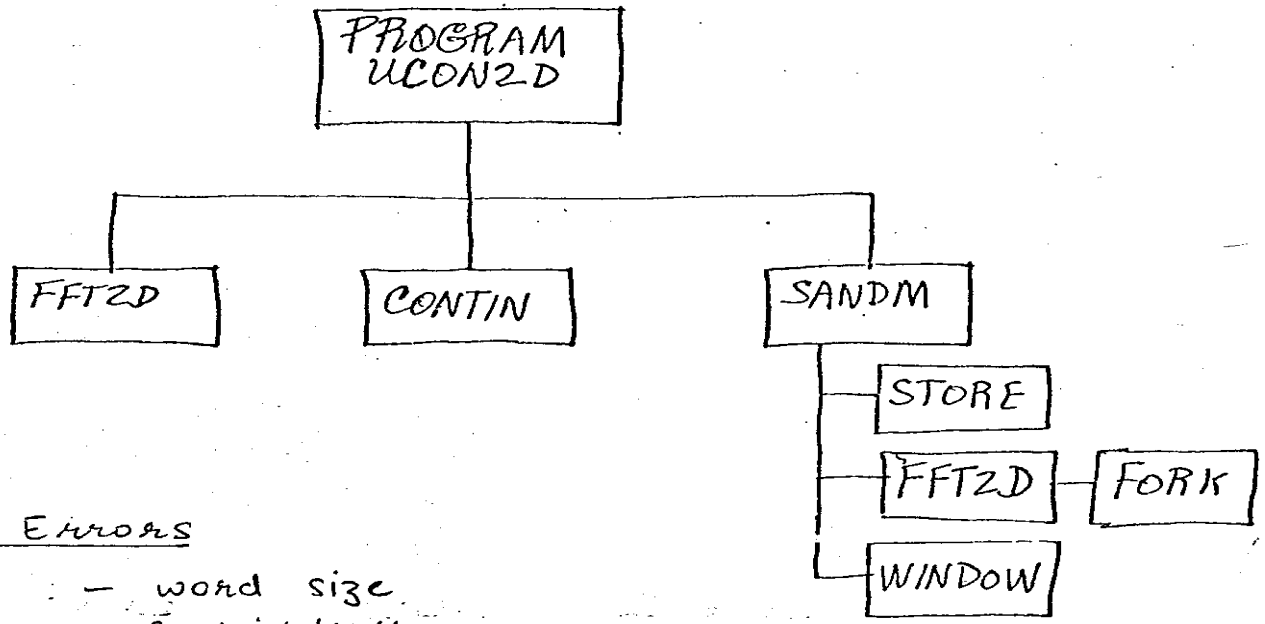


Compiler Errors

1 level 8 - data initialization syntax error in subroutine CONT
2 level 4 - word size
2 level 4 - equivalence

File 19

E-20. . . . . UCON2D performs upward or downward continuation in the frequency domain of uniformly gridded one or two dimensional data sets.



Compiler Errors

3 level 4 — word size
2 level 4 — equivalence
1 level 4 — wrong type function — must be corrected

Magsat program

```
FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR   VER 4.3.5   -- INNOVATION DATA PROCESSING  AUTHORIZED  10/15/93   PAGE  1

FATS070 CONTROL CARD TABLE SIZE IS   4096 BYTES

FATAR CONTROL CARDS

   1--ANALYZE
   2--   PRINT LF=1,B=1-250,CHAR
   3--   PRINT LF=2,B=1-250,CHAR
   4--   PRINT LF=3,B=1-250,CHAR

FATS071 TAPE BUFFER SIZE IS 65535 BYTES

FATS040 TAPEIN IS NOT LABELED - LABELS=NO ASSUMED

                                  CHARACTERISTICS OF THE TAPE TO BE ANALYZED
                                          UNIT  SERIAL  DEN  TRTCH
                                           5BD  NC2001  38000

                                            FATAR DETAIL REPORT

 BLOCK  LNGTH/  MESSAGE/                1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
 NUMBER DISPL   BLOCK TYPE                     (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)

 * * * * * * *  START FILE      1
               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC
       1    80  PRINT REQUESTED              PROGRAM BANDPS %INPUT,OUTPUT,PUNCH,TAPE1,TAPE7#PUNCH,TAPE5#INPUT,T
       2    80  PRINT REQUESTED             1APE6#OUTPUT<
       3    80  PRINT REQUESTED         C**********************************************************************************
       4    80  PRINT REQUESTED         C                  PROGRAM BAND
       5    80  PRINT REQUESTED         C**********************************************************************************
       6    80  PRINT REQUESTED         C
       7    80  PRINT REQUESTED         C     ***************************************************************************
       8    80  PRINT REQUESTED         C     PROGRAM BANDPS PERFORMS BAND PASS FILTERING ON UNIFORMLY GRIDDED
       9    80  PRINT REQUESTED         C     ONE OR TWO DIMENSIONAL DATA SETS.  THIS PROGRAM CALCULATES AND RE-
      10    80  PRINT REQUESTED         C     MOVES THE MEAN VALUE OF THE INPUT DATA PRIOR TU PROCESSING.  USER
      11    80  PRINT REQUESTED         C     SPECIFIED OUTPUTS %SEE DATA CARD 3< INCLUDE LISTINGS AND/OR PUN-
      12    80  PRINT REQUESTED         C     CHED DECKS AND/OR LINE PRINTER %LP< CONTOUR MAPS OF THE ORIGINAL
      13    80  PRINT REQUESTED         C     INPUT DATA AND/OR THE FILTERED DATA AND/OR THE FILTER.  THE FIL-
      14    80  PRINT REQUESTED         C     TERED DATA MAY BE OUTPUT WITH OR WITHOUT THE MEAN VALUE RETURNED.
      15    80  PRINT REQUESTED         C     ***************************************************************************
```

```
    1   MGST(6/80)  NOV 5,6 SCALAR + FINE ATT.   FORMAT(2I3,6F11.4)
    2     2  1-29989.6000      0.0          0.0          0.0          0.0          0.0
    3     2  2  -1958.5900   5608.0500       0.0          0.0          0.0          0.0
    4     3  1  -1994.8100      0.0          0.0          0.0          0.0          0.0
    5     3  2   3027.2400  -2127.3300       0.0          0.0          0.0          0.0
    6     3  3   1661.5500   -196.0600       0.0          0.0          0.0          0.0
    7     4  1   1279.9000      0.0          0.0          0.0          0.0          0.0
    8     4  2  -2179.8400   -334.4090       0.0          0.0          0.0          0.0
    9     4  3   1251.4200    270.6580       0.0          0.0          0.0          0.0
   10     4  4    833.0320   -251.0980       0.0          0.0          0.0          0.0
   11     5  1    938.2940      0.0          0.0          0.0          0.0          0.0
   12     5  2    782.4820    211.6360       0.0          0.0          0.0          0.0
   13     5  3    398.4200   -256.7480       0.0          0.0          0.0          0.0
   14     5  4   -419.2190     52.0013       0.0          0.0          0.0          0.0
   15     5  5    199.2610   -297.6150       0.0          0.0          0.0          0.0
   16     6  1   -217.3690      0.0          0.0          0.0          0.0          0.0
   17     6  2    357.5530     45.1858       0.0          0.0          0.0          0.0
   18     6  3    261.0170    149.4470       0.0          0.0          0.0          0.0
   19     6  4    -73.8681   -150.2620       0.0          0.0          0.0          0.0
   20     6  5   -162.0130    -78.0919       0.0          0.0          0.0          0.0
   21     6  6    -48.2913     91.8463       0.0          0.0          0.0          0.0
   22     7  1     48.3327      0.0          0.0          0.0          0.0          0.0
   23     7  2     65.1825    -14.5014       0.0          0.0          0.0          0.0
   24     7  3     41.3863     93.3856       0.0          0.0          0.0          0.0
   25     7  4   -192.2180     70.6072       0.0          0.0          0.0          0.0
   26     7  5      3.5149    -42.8526       0.0          0.0          0.0          0.0
   27     7  6     13.7031     -2.3682       0.0          0.0          0.0          0.0
   28     7  7   -107.5670     16.8745       0.0          0.0          0.0          0.0
   29     8  1     71.6800      0.0          0.0          0.0          0.0          0.0
   30     8  2    -58.9966    -82.4096       0.0          0.0          0.0          0.0
   31     8  3      1.6067    -27.5058       0.0          0.0          0.0          0.0
   32     8  4     20.5053     -4.9366       0.0          0.0          0.0          0.0
   33     8  5    -12.6077     16.1242       0.0          0.0          0.0          0.0
   34     8  6      0.5904     18.0758       0.0          0.0          0.0          0.0
   35     8  7     10.6249    -22.9375       0.0          0.0          0.0          0.0
   36     8  8     -1.9699     -9.9301       0.0          0.0          0.0          0.0
   37     9  1     18.4394      0.0          0.0          0.0          0.0          0.0
   38     9  2      6.7631      6.9056       0.0          0.0          0.0          0.0
   39     9  3     -0.1489    -17.8990       0.0          0.0          0.0          0.0
   40     9  4    -10.8002      4.0257       0.0          0.0          0.0          0.0
   41     9  5     -7.0326    -22.2823       0.0          0.0          0.0          0.0
   42     9  6      4.2919      9.1702       0.0          0.0          0.0          0.0
   43     9  7      2.7468     16.1325       0.0          0.0          0.0          0.0
   44     9  8      6.2539    -13.1125       0.0          0.0          0.0          0.0
   45     9  9     -1.1676    -14.8342       0.0          0.0          0.0          0.0
   46    10  1      5.5558      0.0          0.0          0.0          0.0          0.0
   47    10  2     10.3702    -21.0515       0.0          0.0          0.0          0.0
   48    10  3      1.1118     15.1903       0.0          0.0          0.0          0.0
   49    10  4    -12.6489      8.9302       0.0          0.0          0.0          0.0
   50    10  5      9.5247     -4.8391       0.0          0.0          0.0          0.0
   51    10  6     -3.3030     -6.5392       0.0          0.0          0.0          0.0
   52    10  7     -1.2556      8.9786       0.0          0.0          0.0          0.0
   53    10  8      6.7714      9.5449       0.0          0.0          0.0          0.0
   54    10  9      1.3578     -5.8746       0.0          0.0          0.0          0.0
   55    10 10     -5.0942      2.1059       0.0          0.0          0.0          0.0
   56    11  1     -3.2831      0.0          0.0          0.0          0.0          0.0
   57    11  2     -3.4900      1.4044       0.0          0.0          0.0          0.0
   58    11  3      2.4741      0.3988       0.0          0.0          0.0          0.0
```

59	11	4	-5.3443	2.6444	0.0	0.0	0.0	0.0
60	11	5	-2.0779	5.6026	0.0	0.0	0.0	0.0
61	11	6	4.5630	-4.2165	0.0	0.0	0.0	0.0
62	11	7	3.1328	-0.4397	0.0	0.0	0.0	0.0
63	11	8	0.6139	-1.2644	0.0	0.0	0.0	0.0
64	11	9	1.8402	3.4847	0.0	0.0	0.0	0.0
65	11	10	2.8489	-0.5119	0.0	0.0	0.0	0.0
66	11	11	-0.5456	-6.1986	0.0	0.0	0.0	0.0
67	12	1	2.4353	0.0	0.0	0.0	0.0	0.0
68	12	2	-1.3253	0.7421	0.0	0.0	0.0	0.0
69	12	3	-1.9499	1.7053	0.0	0.0	0.0	0.0
70	12	4	2.2248	-1.1394	0.0	0.0	0.0	0.0
71	12	5	0.0532	-2.7056	0.0	0.0	0.0	0.0
72	12	6	-0.4381	0.5994	0.0	0.0	0.0	0.0
73	12	7	-0.3155	-0.1395	0.0	0.0	0.0	0.0
74	12	8	1.6908	-2.3812	0.0	0.0	0.0	0.0
75	12	9	1.8305	-0.3055	0.0	0.0	0.0	0.0
76	12	10	-0.5874	-1.4414	0.0	0.0	0.0	0.0
77	12	11	2.1200	-1.5751	0.0	0.0	0.0	0.0
78	12	12	3.5175	0.6205	0.0	0.0	0.0	0.0
79	13	1	-1.5746	0.0	0.0	0.0	0.0	0.0
80	13	2	0.3904	0.5739	0.0	0.0	0.0	0.0
81	13	3	-0.1293	0.6441	0.0	0.0	0.0	0.0
82	13	4	-0.1230	2.3219	0.0	0.0	0.0	0.0
83	13	5	0.5830	-1.5213	0.0	0.0	0.0	0.0
84	13	6	0.5310	0.4778	0.0	0.0	0.0	0.0
85	13	7	-0.5517	0.1566	0.0	0.0	0.0	0.0
86	13	8	-0.4034	-0.4120	0.0	0.0	0.0	0.0
87	13	9	0.1287	0.0044	0.0	0.0	0.0	0.0
88	13	10	-0.4352	-0.0072	0.0	0.0	0.0	0.0
89	13	11	-0.2169	-1.4700	0.0	0.0	0.0	0.0
90	13	12	0.6542	0.3176	0.0	0.0	0.0	0.0
91	13	13	-0.0422	0.7006	0.0	0.0	0.0	0.0
92	14	1	0.0014	0.0	0.0	0.0	0.0	0.0
93	14	2	-0.4890	-0.3715	0.0	0.0	0.0	0.0
94	14	3	0.3090	0.3883	0.0	0.0	0.0	0.0
95	14	4	-0.6988	1.5578	0.0	0.0	0.0	0.0
96	14	5	-0.0122	0.0007	0.0	0.0	0.0	0.0
97	14	6	1.1511	-0.5763	0.0	0.0	0.0	0.0
98	14	7	-0.4207	-0.0886	0.0	0.0	0.0	0.0
99	14	8	0.4438	0.8332	0.0	0.0	0.0	0.0
100	14	9	-0.5596	0.1782	0.0	0.0	0.0	0.0
101	14	10	0.1910	0.7747	0.0	0.0	0.0	0.0
102	14	11	0.1321	0.4524	0.0	0.0	0.0	0.0
103	14	12	0.3599	-0.0995	0.0	0.0	0.0	0.0
104	14	13	-0.3901	-0.0499	0.0	0.0	0.0	0.0
105	14	14	-0.0220	-0.1485	0.0	0.0	0.0	0.0
106								
107			20.3506	-.57065	-.403			

EXI

$WEO LPS

$$

MAGSAT

USER PROGRAMS, TAPE

79-094A-01E,02H SPMS-00399

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED ONE 9-TRACK, 1600 BPI TAPE WRITTEN IN EBCDIC. THERE IS ONE RESTORED TAPE WRITTEN IN ASCII. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 360 COMPUTER AND WAS RESTORED ON THE MRS SYSTEM. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND THE TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES
DR004405	DS004405	D041557	1-37

REQ. AGENT	RAND NO.	ACQ. AGENT
RSH	Y0105	HKH

MAGSAT
79-094A-01E/02H
MAGNETIC ANALYSIS PROGRAMS

This data set consists of 1 tape containing 37 files of data. This tape was created on an IBM 360 computer, is 1600 BPI, 9 TRACK, and written in EBCDIC. The D and C numbers are as follows.

D#	C#
D-41557	C-21065

MAGNETIC ANALYSIS PROGRAMS & DOCUMENTATION

PROGRAM	B#	DOCUMENTATION
1. RDCHRN		INTERNAL
2. TIB		INTERNAL
3. FLDORB	B-32926-000A	MAGSAT ORBIT RETRIEVAL SUBROUTINES SOURCE LISTINGS
4. CVTJUL	B-32936-000A	MAGSAT ORBIT RETRIEVAL SUBROUTINES SOURCE LISTINGS
5. FIT	B-32942-000A	FIT PROGRAM & USER'S GUIDE
6. FDG	B-32940-000A	"GEOMAGNETIC FIELD MODEL EVALUATION SOFTWARE"
7. JCL	B-32937-000A	"THE EQUIVALENT SOURCE MAGNETIC ANOMALY PROGRAM (ESMAP) USER'S GUIDE"
8. ALBERS & SUBROUTINES	B-32937-000A	"THE EQUIVALENT SOURCE MAGNETIC ANOMALY PROGRAM (ESMAP) USER'S GUIDE"
9. ALBERS (WITH PLOTING)	B-32937-000A	"THE EQUIVALENT SOURCE MAGNETIC ANOMALY PROGRAM (ESMAP) USER'S GUIDE"
10. LAMBERT	B-32937-000A	"THE EQUIVALENT SOURCE MAGNETIC ANOMALY PROGRAM (ESMAP) USER'S GUIDE"
11. FILES 7-10 COMBINED	B-32937-000A	"THE EQUIVALENT SOURCE MAGNETIC ANOMALY PROGRAM (ESMAP) USER'S GUIDE"
12. DBCOMP	B-32939-000A	"DELTA-B COMPUTATION PACKAGE DBCOMP DESCRIPTION AND USER'S GUIDE"
13. INDEX OF DIPOLES	B-32939-000A	"DELTA-B COMPUTATION PACKAGE DBCOMP DESCRIPTION AND USER'S GUIDE"
14. DIPOLES FOR THE WORLD	B-32939-000A	"DELTA-B COMPUTATION PACKAGE DBCOMP DESCRIPTION AND USER'S GUIDE"

PURDUE PROGRAMS: (FILES 15-34)

15. BANDPS	B-32423-000A	1. "SPHERICAL EARTH GRAVITY AND MAGNETIC ANOMALY MODELING"
16. BLOCK	B-32938-000A	2. "MAGNETIC & GRAVITY ANOMALY CORRELATION AND ITS APPLICATION TO SATELITE DATA"
17. CLUSTR	B-32425-000A	3. "SPHERICAL EARTH ANALYSIS AND MODELING OF LITHOSPHERIC GRAVITY AND MAGNETIC ANOMALIES"

PROGRAM	B#	DOCUMENTATION
18. DERIVA		
19. MAGPOL		
20. MAPVAR		
21. MGINV1		
22. MGINV2		
23. MGINV3		
24. MGINV4		
25. MODELG		
26. MODELM		
27. MPOILG		
28. PLTCON 2		
29. PROVAR		
30. SKUZZ		
31. SPHERE	B-32423-000A	DOLCAT=C! SPHERICAL EARTH GRAVITY AND MAGNETIC ANOMALY MODELING
32. STRASS		
33. UPCON		
34. DATA FOR USE IN PROGRAMS		
35. ADEPT ✓	B-32941-000A	"U.S. DEPT. OF THE INTERIOR-PRELIMMARY DOC. OF PROG."FFTFIL"
36. SPHERE (GSFC) ✓	B-32423-000A	DLOCAT=C!
37. MGST (6/80) ✓		INITIAL GEOMAGNETIC FIELD MODEL FROM MAGSAT VECTOR DATA GEOPHYSICAL RESEARCH LETTERS VOL. 7, NO. 10 PAGES 793-796 (10/80)

UNITED STATES DEPARTMENT

OF THE INTERIOR

GEOLOGICAL SURVEY

PRELIMINARY DOCUMENTATION OF PROGRAM "FFTFIL"

by

Thomas G. Hildenbrand

U.S. Geological Survey

Denver, Colorado 80225

This report is preliminary and has not been edited or reviewed for conformity with U.S. Survey Geological Standards

Disclaimer

Although "fftfil" has been subjected to several tests on the Honeywell computer, its usage, thus far, has, primarily, been limited to its creator. Consequently, a warranty on accuracy or proper function is neither implied nor expressed.

I. GENERAL DESCRIPTION OF CONTENTS

A. Programs Which Operate on Magsat Data Tapes

1. Subroutine RDCHRN: Reads a chronicle tape on IBM 360.

   Documentation: Internal to the Program

2. Subroutine TIB: Reads and prints Investigator-B tape on IBM 360.

   Documentation: Internal to the Program

3. Programs to Interpret Orbit Records (IBM 360)

   FLDORB: The basic program

   INTORB: Interpolation routine called by FLDORB

   STIROB: Stirling Interpolation, called by FLDORB and by INTORB

   RDCOF, FIELD
   SATPO1: Computes altitude, longitude and altitude (geocentric), called by FLDORB and by INTORB

   FDG1: Computes geomagnetic field. Special version for use with FLDORB

   Documentation: (1) Magsat orbit Retrieval Subroutines Source Listings

   (2) Magsat Data Processing System Specifications

4. Programs to Convert Time (IBM 360):

   CVTJUL: Converts modified Julian date (MJD) to year and fraction of year

   CONDAT: (1) Converts month, day, year to MJD

   (2) Converts year, day of year to MJD

   (3) Converts MJD to month, day, year and to year and day of year.

   ADDTIM: Increments or decrements a given time

   Documentation: Same as 3.

3. Programs to Interpret and Analyze Data

1. FIT Program: Program for Derivation of Geomagnetic Spherical Harmonic Analysis. Operates on IBM 360.

   Documentation: Fit Program Description and Users' Guide by R.H. Estes.

2. FDG Program: for computing the earth's main magnetic field from spherical harmonic coefficients. (IBM 360.)

   Includes subroutines MAGF and EXTFLD.

   Documentation: "Geomagnetic Field Model Evaluation Software."

3. Program for Derivation of Equivalent Source Representation of Crustal Anomalies (IBM 360).

   Documentation: "The Equivalent Source Magnetic Anomaly Program (ESMAP) Users' Guide."

4. Programs for Computing Crustal Anomaly Fields from an Equivalent Source Representation (IBM 360).

   Documentation: "Delta-B Computation Package (DBCOMP) Program Description and Users' Guide."

5. Purdue University Programs for Analysis of Gravity and Magnetic Anomaly Data (CDC and IBM).

   Bandpass Filtering

   Differentiation

   Continuation

   Strike Filtering

   Internal Correspondence Analysis

   Cluster Analysis

   3-D Spherical Earth Modeling.

   Documentation:

   (1) Magnetic and Gravity Anomaly Correlation and its Application to Satellite Data, Bowman et al., 1979

   (2) Spherical Earth Gravity and Magnetic Anomaly Modeling by Gauss-Legendre Quadrature Integration, von Frese et al., 1980a

   (3) Spherical Earth Analysis and Modeling of Lithospheric Gravity and Magnetic Anomalies, von Frese et al., 1980b

6. Program to Estimate Depth to the Magnetic Basement, ADEPT (IBM 360)

   Documentation: Preliminary Documentation of Program "FFTFIL,"
   Tom Hildenbrand, USGS

7. University of Miami (Christopher Harrison) Programs for Magsat Analysis (Univac, Fortran).

Program Description

a. Program TAPERD (TAPE READ)

   Translates NASA supplied EBCDIC tape and stores on disk.

b. Program FILEUP (FILL BREAK DOWN)

   Sorts data into specified subfiles based on geographical broundaries supplied by user. Calculates and stores spherical coordinates and direction of main field for each data point.

c. Program INVERT (FIELD INVERSION)

   Calculates the matrix relating field measurement to equivalent source magnetization. Solves the matrix equation using the Crout varient of Gauss-Jorden reduction. Provision is made for using either dipoles or spherical prisms as the equivalent sources.

d. Program MAGPLT (MAGNETIZATION PLOT)

e. Program FLDPLT

   Uses the output of INVERT and expands the equivalent source array to a grid of field values at specified altitude. Contours, plots and stores resultant field.

f. Program FLDFIT

Determines how well the calculated field matches the observed field. Produces a series of satellite track plots comparing calculated to observed.

g. Program TRCPLT

Calculates, plots and stores a magnetic profile at given altitude and orientation using the output from INVERT.

II. TAPE ORGANIZATION.

The software is contained in 38 files on an IBM360 tape with RECFM=FB, LRECL=80 and BLKSIZE = 7280.

FILE 1: contains RDCHRN

FILE2: contains TIB

FILE 3: contains the programs to read and interpret MAGSAT orbit records.

FILE 4: contains the programs to convert time.

FILE 5: contains the FIT program.

FILE 6: contains the FDG program and supporting subroutines.

FILES 7 through 11: contain the programs for derivation of equivalent source solutions:

7: Job Control Language
8: Version using Albers Equal Area projection, no plotting capability
9: Same as 8 except plotting capability added.
10: Version using Lambert Equal Area projection.
11: Contents of files 8-10 combined into one file.

FILES 12-14: contain programs for computing crustal anomaly fields from an equivalent source representation.

12: the software
13: an index for available dipoles
14: the dipoles for the world.

FILES 15-34: contain Purdue University Programs for Analysis of gravity and magnetic anomaly data.

15: BANDPS
16: BLOCK
17: CLUSTR
18: DERIVA
19: MAGPOL
20: MAPVAR
21: MGINV1
22: MGINV2
23: MGINV3
24: MGINV4
25: MODELG
26: MODELM
27: MPOILG

28: PLTCON2
29; PROVAR
30: SKUZZ
31: SPHERE
32: STRASS
33: UPCON
34: Data for use in programs

FILE 35: contains ADEPT

FILE 36: contains the GSFC adaptation of the Purdue SPHERE program

File 37: contains the MGST(6/80) spherical harmonic analysis of the earth's main field

FILE 38: contains the MGST(4/81-2) spherical harmonic analysis of the earth's main field.

The program has been constructed to handle large data sets (maximum number of rows and columns = 1,000). It will accept incomplete data (i.e., irregular shaped grids) provided the missing data is flagged by the maximum floating point number (octal 37677777777). However, in order to fast Fourier transform, flagged data are assigned temporary values by means of an averaging technique. In assigning a value to a flagged grid point, the routine searches and then averages the four neighboring grid values (a neighboring flagged point is ignored). When the desired filtering operation has been completed, flagged values are reinserted into those grid points assigned temporary values. The user is cautioned against input grids containing appreciably large regions of missing data. Such grids may introduce unwanted characteristics in the frequency domain resulting in erroneous output filtered grids.

To reduce distortion at the edges of the filtered maps, the mean value of the grid's boundary values can be subtracted from the input data. Truncation of the data is the cause of this distortion known as Gibb's phenomena. In addition, distortion at the edges of the filtered grids can be appreciably reduced by adding rows and columns containing assigned grid values. The routine will automatically perform this task when the user specifies the number of rows and columns to be added to each side of the input grid. Normally, ten rows and columns eliminate distortion at the maps boundaries. However, in applying the second vertical derivative and the downward continuation operators which possess long operator lengths, it may be necessary to increase the grid size by more than 10 rows and columns. For the purpose of lessening distortion at the boundaries, the user is advised to utilize the option to increase the grid size.

The program written in HONEYWELL/MULTICS-FORTRAN can be transformed to other computers with a moderate amount of revision by an experienced programmer. The listings contain all codes except for input/output routines as they will vary on different computers. These input/output routines as well as their function are given below:

SUBROUTINE	FUNCTION
fatt	Attaches a switchname to a file.
fdet	Detaches a switchname to a file.
io	Attaches/detaches a switchname to a file or opens/closes a file in a specified mode.
closet	Closes all open files.
dl	Deletes the specified file.
copy	Creates a copy of the specified file with the specified name.

Execution of "fftfil"

After the program is loaded an asterisk is typed on the terminal. The user responds with the name of the command file. After the current command file is executed and the data has been filtered, the routine asks if an additional filter is to be applied and the needed information to perform the new filter operation. The user can apply as many filters as desired to the original data set. When filter operations have been completed on a particular data set, the routine will request another command file. This sequence can be continued indefinitely. To exit from the program, the user can enter "ex" or a line feed after the asterisk is typed. Examples of the execution of "fftfil" are given in Appendix B.

"fftfil" Command File

The command file is an ASCII file containing the required information to filter gravity or magnetic data. It is comprised of five fixed format lines followed by a "&parms" namelist section. The namelist section may be continued on several lines. The five fixed format lines may be blank which results in the routine requesting the user to respond with the required information. This allows the user to execute a command file several times but perform different filtering operations on various input grids.

Details of Command File

Line 1

Characters 1 through 6 contain the coded filter operation to be performed. The possible operations are:

Coded Operation	Explanation
psdgrv	Pseudo-gravity transformation.
psdmag	Pseudo-magnetic transformation.
redpol	Reduction of total magnetic field intensity to the pole.
upcont	Upward continuation.
dncont	Downward continuation.
lstver	1sr-vertical derivative.
2ndver	2nd-vertical derivative.
strike	Direction filtering.
banpas	Band pass filtering.

If the field is blank, the routine will request the coded operation. The user may also respond with "help" which results in the routine printing the possible coded operations and then requesting again the desired operation. If an incorrect operation is entered, the routine will print out the possible operations and then request one of the six possible operations.

Line 2

Datum level (km) in the fixed format "F12.6" is entered on this line. The routine assumes the elevation of the input data is at a level of zero kilometers. If the desired output grid for all filter operations (except direction filtering) is to be observed at a different datum level, the user can enter the number of kilometers (<0 for upward continuation; >0 for downward continuation) on this line. For instance, if the magnetic field is to be reduced to the North Pole and also upward continued 2 km, the user can enter "redpol" on line 1 and "-2." on line 2. Enter "0.0" as the datum level if the filtered output grid is to be observed at the same level as the input grid. If the field is blank the routine will request the desired datum level.

Line 3

Characters 1 through 50 contain the file name of the standard format two-dimensional file (see Appendix A) to be filtered. If the field is blank, the routine will request the file name.

Note that if the namelist parameter "icoef" (described below) is equal to -1, the Fourier coefficients of the data set, determined from a previous run, are used as input to "fftfil". In responding to the query of the input file name, the user must, however, enter the file name of the standard U.S.G.S. grid from which the inputed Fourier coefficients were calculated. The routine reads only the header record of the standard grid to obtain the number of rows, columns, etc.

Line 4

Characters 1 through 50 contain the output file name. The output filtered grid is written in standard form. If the field is blank, the routine will request the file name.

Line 5

Title line (characters 1 through 56) to be written in header record of output standard grid.

Line 6

Namelist Section

Characters 1 through 6 must contain: &parms. Characters from 8 on may contain namelist items as well as continuation lines. Section must be terminated by an &. All the namelist items listed below have been given default conditions.

Namelist Items	
ioptl = 0	No printed output.
-1	Output filtered grid printed (ASCII) in file "conver.out."
6	Output filtered grid printed (ASCII) on terminal (default condition, ioptl = 0).

iopt2 = 0	Substract mean of boundary values from input grid.
1	Subtract mean from grid and save resulting grid: file name = "con.grd".
-1	No subtraction of mean (default condition, iopt2 = -1).
nadd =	Number of rows and columns added to each side of input grid to reduce the effects of Gibbs phenomena (default condition, nadd = 0).
idval = 0	No flagged data in input grid.
1	Flagged data in input grid (default condition, idval = 0: note, the first row must not consist of entirely flagged values).
-1	Flagged values have been removed from data set and their locations are in segment "flag.loc".

[Note: User must specify idval = -1 if the Fourier coefficients of the data (determined from a previous run) are to be used as input and if the data contains missing data. When the Fourier coefficients were computed, a file named "flag.loc" was created in the user's disk area. Specifying idval = -1 results in the routine reading "flag.loc" for the purpose of restoring the outputed filtered grid to shape of the input grid.]

den = Density contrast (gm/cc) required in pseudo-gravity and pseudo-magnetic transformations (default conditions, den = 1.).

bmag = Magnetization contrast (gammas) required in pseudo-gravity and pseudo-magnetic transformations (default condition, bmag = 1.).

bdec & binc = Respectively, declination and inclination (degrees) of the magnetization vector associated with the magnetic source. Parameters are required in pseudo-gravity and pseudo-magnetic transformations and reduction of total magnetic field to pole (default conditions; bdec = 0.0, binc = 90.).

dec & xinc = Respectively, declination and inclination (degrees) of the earth's ambient magnetic field. Parameters are required in pseudo-gravity and pseudo-magnetic transformation and reduction of the total magnetic field intensity to the pole (default conditions; dec = 0.0, xinc = 90.).

istr = -1 Reject trends striking between "thet1" and "thet2".

1 Pass only trends striking between "thet1" "thet2". Parameter is required for directional filtering (default condition; istr = 1).

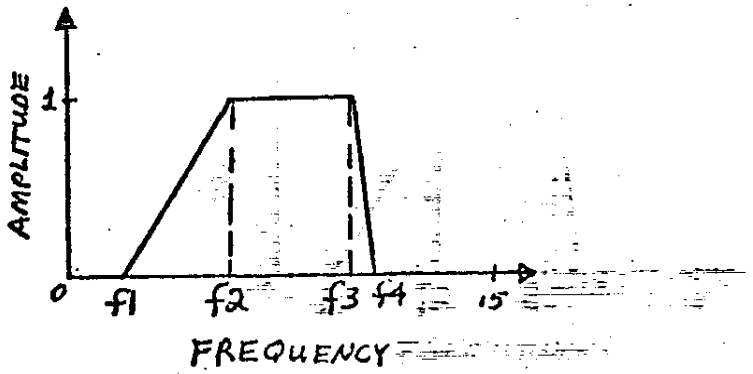
thetl & thet2 = Angles from Geographic North that form a pie-slice filter (required for directional filtering). A clockwise direction from Geographic North designates positive angles. The following conditions must be met:

$-90 \leq thetl \leq 90.$

$-90 \leq thet2 \leq 90.$

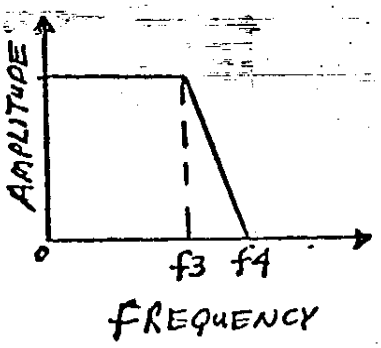
$thet2 \geq thetl$

f1,f2,f3,f4 = cutoff frequencies used in band pass filter and described in the following diagram:

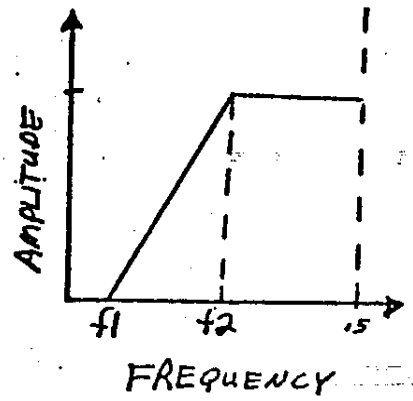


Data within tetrahedron is passed. These parameters can also be used to design a low-pass or high-pass filter:

Low pass--



High pass--



[Note: $0.0 \leq f \leq .5$ and $f1 \leq f2 \leq f3 \leq f4$; unit grid spacing is assumed in computing f1, f2, f3 and f4. For instance, if wavelengths less than 10 km are to be removed from the data, one may design a filter with the following cutoff frequencies:

f1 = 0.0

f2 = 0.0

f3 = 1/10 = .1

f4 = .12].

[Default condition: f1 = f2 = 0.0

f3 = f4 = 0.5]

icoef = 1 Save Fourier coefficients of input segment in file "fftfil.coef" for later use as input to program [note: if data contains flagged values, a segment called "flag.loc" containing their locations is also created in user's disk area].

0	Fourier coefficients not saved [default condition: icoef = 0].
-1	Fourier coefficients in segment "fftfil.coef" are used as input. Note that if the flagged values are present in the data, segment "flag.loc" is required and "indual" must be equal to -1 so that the filtered grid can be restored to the shape of the original input grid.

[The following namelist items can be used to change the grid spacing or origin of input standard grid if these parameters are not in units of kilometers in the header record. (Default conditions, s = xo = yo = 0.0.]

S =	grid spacing (km). (Note: spacing of columns must equal spacing of rows.)
xo =	position (km) of first data row.
yo =	position (km) of first column row.

"fftfil" Queries

The following queries are asked after filtering operations have been completed. The purpose of these queries is to apply additional filters to the data.

Query 1: Additional filters to be applied? Enter "y" if an additional filter is to be applied to data. If "y" is entered, queries 2 - 6 are asked. If "n" is entered, the program starts over by asking for a new command segment.

Query 2: New filter operator? (Format the same as that given for command "line 1" in command segment.)

Query 3: New datum level? (Format the same as that given for command "line 2" in command segment.)

Query 4: New output segment name? (Format the same as that given for command "line 4" in command segment.)

Query 5: New title? (Format the same as that given for command "line 5" in command segment.)

Query 6: Enter "y" if some of the namelist parameters are to be changed for the new filter operation. The parameters to be changed must be given on the following line in a namelist beginning with "&parmm" and ending with "&". [Example: &parmm thet1 = -90., thet2 = 0., &.] Enter "n" if no parameter change is needed. In this case, the filtering operations are started.

[Note: the following parameters cannot be changed--nadd, iopt2, idval, s, xo, and yo.]

Query 1 is then asked again. In other words, queries 1 - 6 are repeated until a user's response of "n" is encountered after a filtering operation has been completed.

References

Byerly, P. E., 1965, Convolution filtering of gravity and magnetic maps: Geophysics, v. 30, p. 281-283.

Dean, W. C., 1958, Frequency analysis for gravity and magnetic interpretation: Geophysics, v. 23, p. 97-127.

Embree, P., Burg, J. P., and Backus, M. M., 1963, Wide-band velocity filtering--the pie-slice process: Geophysics, v. 28, no. 6, p. 948-976.

Evenden, G. I., 1975, A general purpose contouring system: U.S. Geological Survey, Open-File Report 75-317, p. 105.

Fuller, B. D., 1967, Two-dimensional frequency analysis and design of grid operators: Mining Geophysics, v. 2, p. 658-708.

Naidu, P. S., 1969, Estimation of spectrum and cross-spectrum of aeromagnetic field using fast Fourier transform techniques: Geophysical Prospecting, v. 17, p. 344-361.

Appendix A

Standard File

The U.S.G.S. standard file (Evenden, 1975) consists of two basic parts: 1) a header record providing control parameters and, optionally, a following record of column coordinates, and 2) the profile or grid data. The general description of the file is given below with added notes of requirements for the program "fftfil". Note that the direction of columns and rows are, respectively, north-south and east-west. In addition, "fftfil" assumes that the first value stored in the data array is located at the lower left-hand corner of the map. Recording mode is unformatted.

A. Header record (23 words)

id:	56 ASCII characters of identification (14 words).
pgm:	8 ASCII characters of creation program identification (two words).
ncol:	number of columns of data (integer, one word).
nrow:	number of rows of data (integer, one word).

nz: number of words per data element (integer, one word). For single precision, single value data use 1, double precision or complex use 4, ... etc. In the execution of "fftfil", nz must equal 1.

[The following parameters should be in units of kilometers for the program "fftfil"]

yo: position of first column of data (real, one word).

dy: equal spacing interval of columns (real, one word). If equal to zero, then coordinate for each column is in the data record, otherwise the following record consists of data. For "fftfil", dy cannot equal zero and must be equal to dx.

xo: position of first row (real, one word).

dx: equal spacing interval of rows (real, one word). If equal to zero, the coordinate for each row is the first word of each data record row. For "fftfil", dx cannot equal zero and must be equal to dy.

B. Column coordinate record (not used in "fftfil") present if dy of header record equals zero. Record consists of "ncol" real words specifying the coordinates of each data column. Most programs require the coordinates to be in monotonic order.

C. Data record. Each data record contains one row of real data items. For "fftfil", the data must be in units of gammas or mgals. The total record length is "ncol" times "nz" plus one word. The first word contains the row coordinate if "dx" is zero. When "dx" is not zero, the first word is ignored (which is the case in executing "fftfil"). When specified, the row coordinates should be in monotonic sequence. Many programs accept incomplete data where the missing data is flagged by the maximum floating point number (376777777777).

In general, I/O for this standard file can be stated in FORTRAN as:

```
dimension g(iz,iy,ix),id(14),pgm(2),x(ix),y(iy)
 . .
 . .
read or write (. .)id,pgm,ncol,nrow,nz,yo,dy,xo,dx
if(dy.eq.0.) read or write (. .) (y(i),i = 1,ncol)
if(dx.eq.0.) go to 15
do 10 j = 1,nrow
10 read or write (. .) x(j),((g(k,i,j),k = 1,nz),i = 1,ncol)
go to 20
15 do 19 j = 1,nrow
19 read or write (. .) dum,((g(k,i,j),k = 1,nz),i = 1,ncol)
20 continue
 . .
```

The above is a simplistic example and general usage is not warranted nor suggested. It is only provided as a guide.

Appendix B

Examples

Two command segments named "fftfil.cmd1" and "fftfil.cmd2" are given below to illustrate the many options in the routine. It should be noted that in Example 2 the Fourier coefficients of the data, determined in Example 1, are used as input.

Command File

```
INT FFTFIL.CMD2

                    FFTFIL.CMD2          11/29/78  1317.7 MST WED


PARMS
IOPT1=-1,IOPT2=-1,NADD=4,DEN=.2,BMAG=300.,DEC=3.,XINC=67.,
BDEC=3.,BINC=67.,IDVAL=-1,XO=0.,YO=0.,F1=0.,F2=0.,F3=.1,F4=.15
THET1=-90.,THET2=0.,S=0.,ICOEF=-1
END

11/29/78  1317.7 MST WED CPU:  0.063 COST: $0.07
```

Execution

```
TFIL
 FFTFIL.CMD2
NTER OPERATOR: UPCONT
NTER DATUM LEVEL Z: -2.
NT. INPUT FILE NAME: EXAMPLE.GRD
NTER OUTPUT FILE NAME: UPCONT.GRD
NTER TITLE: EXAMPLE OF UPWARD CONTINUATION
DDITIONAL FILTERS TO BE APPLIED? (Y OR N) Y
NTER NEW OPERATOR: STRIKE
NTER NEW DATUM LEVEL: 0.
NTER NEW OUTPUT FILE NAME: NWTREND.GRD
NTER NEW TITLE
RTHWEST TRND:END MAP
ARAMETER CHANGE? (Y OR N; IF Y ENTER NAMELIST PARAMETERS VIA &PARMM): N
DDITIONAL FILTERS TO BE APPLIED? (Y OR N) Y
NTER NEW OPERATOR: STRIKE
NTER NEW DATUM LEVEL: 0.
NTER NEW OUTPUT FILE NAME: NETREND.GRD
NTER NEW TITLE
RTHEAST TREND MAP
ARAMETER CHANGE? (Y OR N; IF Y ENTER NAMELIST PARAMETERS VIA &PARMM): Y
ARMM THET1=0.,THET2=90.,&
DDITIONAL FILTERS TO BE APPLIED? (Y OR N) N

OP
11/29/78  1332.6 MST WED CPU:  9.413 COST: $3.09
```

Example 1

Command File

```
R FFTFIL.CMD1

                    FFTFIL.CMD1          11/29/78  1302.6 MST WED

EDPOL
.
XAMPLE.GRD
EDPOL.GRD
XAMPLE OF REDUCTION TO POLE
%PARMS
 IOPT1=0,IOPT2=0,NADD=4,DEN=.2,BMAG=300.,DEC=3.,XINC=67.
 BDEC=3.,BINC=67.,IDVAL=1,XO=0.,YO=0.,F1=0.,F2=0.,F3=.1,F4=.15
 THET1=-90.,THET2=0.,S=0.,ICDEF=1
%END

 11/29/78  1302.6 MST WED CPU:  0.068 COST: $0.07
```

Execution

```
FTFIL
) FFTFIL.CMD1

EAN VALUE SUBTRACTED =    0.14285714E+02        49 VALUES USED

014TRANSFORMATION OF THE TOTAL MAGNETIC FIELD INTENSITY TO THE POLE, BY MEANS
 THE FAST FOURIER TRANSFORM AND THE POISSON EQUATION.

ITLE: EXAMPLE OF REDUCTION TO POLE

RAMETERS: DENSITY=  0.200    DATUM LEVEL Z=  0.000
          INTENSITY OF MAGNETIZATION=  300.000
          INCLINATION & DECLINATION OF GEOMAGNETIC FIELD=  67.000   3.000
          INCLINATION & DECLINATION OF MAGNETIZATION VECTOR=  67.000   3.00
          THET1=  -90.000   THET2=  0.000   ISTR= 1
          F1,F2,F3 &F4=  0.00000  0.00000  0.10000  0.15000
          GRID INTERVAL=0.200000E+01
          ORIGIN OF GRID (XO ,YO)=  0.500000E+01  0.200000E+01
          NO. OF COLUMNS & ROWS=  12  10
          INPUT FILE NAME: EXAMPLE.GRD
          OUTPUT FILE NAME: REDPOL.GRD


ADDITIONAL FILTERS TO BE APPLIED? (Y OR N) N
) F

TOP
 11/29/78  1303.8 MST WED CPU:  7.945 COST: $2.47
```

DRDS0044405

79-094A-01E, 08

```
FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR   VER 4.3.5   -- INNOVATION DATA PROCESSING  AUTHORIZED  10/28/93   PAGE   1

FATS070 CONTROL CARD TABLE SIZE IS   4096 BYTES

/ATAR CONTROL CARDS

   1--  ANALYZE BLP,PRTLEN=252
   2--  PRINT LF=1,B=1-4,CHAR                                                    00000110

FATS071 TAPE BUFFER SIZE IS 65535 BYTES

FATS040 TAPEIN IS NOT LABELED - LABELS=NO ASSUMED

                                  CHARACTERISTICS OF THE TAPE TO BE ANALYZED
                                          UNIT  SERIAL  DEN  TRTCH
                                           5BE  DC2282  38000

                                            FATAR DETAIL REPORT

 BLOCK  LNGTH/  MESSAGE/                1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
 NUMBER DISPL   BLOCK TYPE                    (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)

* * * * * * *  START FILE       1

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

       1  7280  PRINT REQUESTED          C                                                                    RDCHRN
        +00080                                SUBROUTINE RDCHRN(QSTART,QCOIL,QDATA,QORB,QCHECK,QEOF,LERR,NRECIN)RDCH    1
        +00160                          C                                                                    RDCH    2
        +00240                          C***********

       2  7280  PRINT REQUESTED                DO 1 I = 1, 8                                                 RDCH   91
        +00080                                   NRECIN(I) = 0                                              RDCH   92
        +00160                              1 CONTINUE                                                      RDCH   93
        +00240                                NREC =

       3  7280  PRINT REQUESTED                IF (ITYPE.GE.8.AND.ITYPE.LE.10) ITYPE = ITYPE - 3           RDCH  182
        +00080                                IF (ITYPE.EQ.16) ITYPE = 8                                  RDCH  183
        +00160                                IF (QSKIP) GO TO 10                                         RDCH  184
        +00240                          C

       4  1360  PRINT REQUESTED          C                                                                   RDCH  273
        +00080                          C     NEW TIME GROUP                                                RDCH  274
        +00160                          C                                                                   RDCH  275
        +00240                          C     MESSAG

* * * * * * *  END OF FILE       1  -- FILE CONTAINED       4 BLOCKS

* * * * * * *  START FILE       2

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

* * * * * * *  END OF FILE       2  -- FILE CONTAINED       1 BLOCKS

* * * * * * *  START FILE       3

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

* * * * * * *  END OF FILE       3  -- FILE CONTAINED      10 BLOCKS
```

FATAR DETAIL REPORT

```
BLOCK  LNGTH/  MESSAGE/                1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
NUMBER DISPL   BLOCK TYPE                    (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

* * * * * * *  END OF FILE     33  -- FILE CONTAINED       7 BLOCKS

* * * * * * *  START FILE      34

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

* * * * * * *  END OF FILE     34  -- FILE CONTAINED      46 BLOCKS

* * * * * * *  START FILE      35

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

* * * * * * *  END OF FILE     35  -- FILE CONTAINED       5 BLOCKS

* * * * * * *  START FILE      36

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

* * * * * * *  END OF FILE     36  -- FILE CONTAINED      27 BLOCKS

* * * * * * *  START FILE      37

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

      1  7280  PRINT REQUESTED          1400000001001979.96371.2
       +00080                          MGST(6/80)  NOV 5,6 SCALAR + FINE ATT.  FORMAT(2I3,6F11.4)
       +00160                           2  1-29989.6000     0.0        0.0        0.0        0.0        0.0
       +00240                           2  2 -1958

      2  1440  PRINT REQUESTED           13 13    -0.0422     0.7006     0.0        0.0        0.0        0.0
       +00080                           14  1     0.0014     0.0        0.0        0.0        0.0        0.0
       +00160                           14  2    -0.4890    -0.3715     0.0        0.0        0.0        0.0
       +00240                           14  3     0

* * * * * * *  END OF FILE     37  -- FILE CONTAINED       2 BLOCKS

* * * * * * *  START FILE      38

               FATS038 DATA FILE IN ISCII/ASCII - TRANSLATED TO EBCDIC

* * * * * * *  END OF FILE     38  -- FILE CONTAINED       0 BLOCKS

FATS020 ANALYSIS TERMINATED AT TAPEMARK SEQUENCE
```

FINAL TOTALS

FILES READ	BLOCKS READ	BYTES READ	FEET READ	TEMP ERRS	PERM ERRS	FILES WRITTEN	BLOCKS WRITTEN
37	446	3123520	10	0	0	0	0

MAGSAT

CHRONFIN (CHRONICLE FINE), TAPE

79-094A-01F, 02I SPMS-00616

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 29 9-TRACK, 6250 BPI TAPES, WRITTEN IN BINARY. THERE ARE 29 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, AND THEY WERE RESTORED ON AN IBM 9021. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR004881	DS004881	D043244	2	11/01/79 - 11/07/79
DR004882	DS004882	D043245	2	11/07/79 - 11/15/79
DR004883	DS004883	D043246	2	11/15/79 - 11/23/79
DR004884	DS004884	D043247	2	11/23/79 - 12/01/79
DR004885	DS004885	D043535	2	12/01/79 - 12/09/79
DR004886	DS004886	D043536	2	12/09/79 - 12/17/79
DR004887	DS004887	D043537	2	12/17/79 - 12/25/79
DR004888	DS004888	D043538	2	12/25/79 - 01/02/80
DR004889	DS004889	D043539	2	01/02/80 - 01/10/80
DR004890	DS004890	D043896	2	01/10/80 - 01/18/80
DR004891	DS004891	D043897	2	01/18/80 - 01/26/80
DR004892	DS004892	D045114	2	01/26/80 - 02/03/80
DR004893	DS004893	D044744	2	02/03/80 - 02/11/80
DR004894	DS004894	D045300	2	02/11/80 - 02/19/80
DR004895	DS004895	D045301	2	02/19/80 - 02/27/80
DR004896	DS004896	D045302	2	02/27/80 - 03/06/80

79-094A-01F, 02I

DR#	DS#	DD#	FILES	TIME SPAN
DR004897	DS004897	D045321	2	03/06/80 - 03/14/80
DR004898	DS004898	D045322	2	03/14/80 - 03/22/80
DR004899	DS004899	D045323	2	03/22/80 - 03/30/80
DR004900	DS004900	D045324	2	03/30/80 - 04/07/80
DR004901	DS004901	D045325	2	04/07/80 - 04/15/80
DR004902	DS004902	D045326	2	04/15/80 - 04/23/80
DR004903	DS004903	D045327	2	04/23/80 - 05/01/80
DR004904	DS004904	D045328	2	05/01/80 - 05/09/80
DR004905	DS004905	D045329	2	05/09/80 - 05/17/80
DR004906	DS004906	D045330	1	05/17/80 - 05/19/80

REQ. AGENT	RAND NO.	ACQ. AGENT
DEW GWM		HKH

MAGSAT

79-094A-01F/02I

FINE ATTITUDE DATA

This data set consists of 26 tapes. The tapes are 9 track, 6250 bpi, binary, and are multifiled. The tapes were created on an IBM 360 computer. The 'D' numbers and time spans follow:

D#	C#	FILES	TIME SPAN
D-43244	C-26424	2	11/01/79 - 11/07/79
D-43245	C-26425	2	11/07/79 - 11/15/79
D-43246	C-26426	2	11/15/79 - 11/23/79
D-43247	C-26427	2	11/23/79 - 12/01/79
D-43535	C-26428	2	12/01/79 - 12/09/79
D-43536	C-26429	2	12/09/79 - 12/17/79
D-43537	C-26430	2	12/17/79 - 12/25/79
D-43538	C-26431	2	12/25/79 - 01/02/80
D-43539	C-26432	2	01/02/80 - 01/10/80
D-43896	C-26433	2	01/10/80 - 01/18/80
D-43897	C-26434	2	01/18/80 - 01/26/80
D-45114	C-26435	2	01/26/80 - 02/03/80
D-44744	C-26436	2	02/03/80 - 02/11/80
D-45300	C-26437	2	02/11/80 - 02/19/80
D-45301	C-26871	2	02/19/80 - 02/27/80
D-45302	C-26438	2	02/27/80 - 03/06/80
D-45321	C-26439	2	03/06/80 - 03/14/80
D-45322	C-26440	2	03/14/80 - 03/22/80
D-45323	C-26441	2	03/22/80 - 03/30/80
D-45324	C-26442	2	03/30/80 - 04/07/80
D-45325	C-26443	2	04/07/80 - 04/15/80
D-45326	C-26702	2	04/15/80 - 04/23/80
D-45327	C-26444	2	04/23/80 - 05/01/80
D-45328	C-26445	2	05/01/80 - 05/09/80
D-45329	C-26446	2	05/09/80 - 05/17/80
D-45330	C-26447	1	05/17/80 - 05/19/80

44178

44181
−43873
308 days after day 1 = Day 308

THE ORBIT DATA RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: = 0, indicating satellite position data	*L*1
1	Data type of next record	**L*1
2	Spare	
4	Date of first observation (MJD)	I*4
8	Milliseconds of day for first observation	I*4
12	Time increment between observations (MS)	I*4
16	Greenwich hour angle at epoch	R*4
20	Reference time of coordinate system (MJD + fraction of day)	R*4
24	X inertial coordinate (km, 128 values)	R*4
536	Y inertial coordinate (km, 128 values)	R*4
1048	Z inertial coordinate (km, 128 values)	R*4
1560	Invariant Latitude (128 values)	R*4
2072	Geomagnetic time (128 values)	R*4
2584	Dipole latitude (128 values)	R*4

*8 bit binary value
** On investigator copy only

Definition of MJD:

Day number 1 of 1979 is (MJD −43873).

Thus MJD = 44181 denotes day 308, 1979, which is Nov

THE VECTOR DATA (NEV COORDINATES) CHRONICLE RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: =5, 6, 7, indicating vector x,y, or z observations, respectively, generated from intermediate attitude data =8, 9, 10, for data generated from fine attitude data	*L*1
1	Data type of next record	**L*1
2	Spacecraft status (see record types 2-4)	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time Offset (ms)	R*4
20	Spare	-
24	Vector component observations (gammas; 1024 values)	R*4
4120	Number of points in this record that overlap with the next record of this type	I*2

*8 bit binary value
**On investigator copy only

THE VECTOR DATA (SENSOR PLATFORM COORDINATES) CHRONICLE RECORD [illegible] AS FOLLOWS:

Displacement (bytes)	Parameter	
0	Data type: = 2, 3, 4, indicating vector a, b, or c observations, respectively	L*1
1	Data type of next record	L*1
2	Spacecraft status (5 digit integer - abcde) a = 1, calibration on b = 1, electronic flip on c = 1, x coil on d = 1, y coil on e = 1, z coil on	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time offset (ms)	R*4
20	Spares	I*4 I*2
24	Fine counts (1024 values, pad = 9999)	L*1
2072	Coarse counts (1024 values, pad = 255)	
3096	Number of points in this record that overlap with the next record of this type	

*8 bit binary value
**On investigator copy only

THE ATTITUDE QUALITY CHRONICLE RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameters	Type
0	Data type: =16, indicating attitude quality data	*L*1
1	Data type of next record	**L*1
2	Spare	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time offset (ms)	R*4
20	Spare	I*4
24	Attitude processing flags (synchronized with every fourth vector observation starting with first observation of record)	I*2

*8 bit binary value
**On investigator copy only

PROCESSING FLAG DEFINITION

A five-character processing flag, ±abcde, is defined as follows:

Character	Description
a	Smoothing character (level of smoothing of final attitude): = 0, no smoothing = 1, linear smoothing = 2, nonlinear smoothing
b	Residual character: = 0, all residuals within boundaries = 1, QUEST* residual and SC1 acceptable, SC2 bad = 2, QUEST residual acceptable, SC1 bad, SC2 acceptable = 3, QUEST residual acceptable, SC1 and SC2 bad = 4, QUEST residual bad, SC1 and SC2 acceptable = 5, QUEST residual bad, SC1 acceptable, SC2 bad = 6, QUEST residual and SC1 bad, SC2 acceptable = 7, QUEST residual SC1, and SC2 bad
c	Gyro and ATS character: = 0, observed gyro point, observed ATS point = 1, observed gyro point, interpolated ATS point = 2, observed gyro point, default ATS value = 3, interpolated gyro data, observed ATS point = 4, interpolated gyro data, interpolated ATS point = 5, interpolated byro data, default ATS value = 6, gyro data point invalid, observed ATS point = 7, gyro data point invalid, interpolated ATS point = 8, gyro data point invalid, default ATS value

*QUEST referes to the attitude determination least squares program.

PROCESSING FLAG DEFINITION (cont'd)

Character	Description
d	Attitude computation character (method of final attitude computation): = 0, with QUEST, using three vectors = 1, with QUEST, using SC1 and SC2 = 2, with QUEST, using SC1 and FSS = 3, with QUEST, using SC2 and FSS = 4, using SC1 and gyro = 5, using SC2 and gyro = 6, using FSS and gyro = 7, not computed
e	Pattern matching character: = 0, SC1 and SC2 valid, identified = 1, SC1 valid, identified; SC2 valid, not identified = 2, SC1 valid, identified; SC2 not valid = 3, SC1 valid, not identified; SC2 valid, identified = 4, SC1 valid, not identified; SC2 valid, not identified = 5, SC1 valid, not identified; SC2 not valid = 6, SC1 not valid; SC2 valid, identified = 7, SC1 not valid; SC2 valid, not identified = 8, SC1 not valid; SC2 not valid

PAGSAT

CHRONICLE DATA TYPES

1. ORBIT

2. SCALAR

3. VECTOR (Spacecraft coordinates - data in counts)

   3.1 A

   3.2 B

   3.3 C

4. VECTOR (Topocentric coordinates - intermediate attitude)

   4.1 X

   4.2 Y

   4.3 Z

5. VECTOR (Topocentric coordinates - fine attitude)

   5.1 X

   5.2 Y

   5.3 Z

6. ATTITUDE QUALITY (For fine attitude only)

TYPE OF CHRONICLE TAPES

Types according to item numbers on previous page. There is a "record type" code in the data which is different from this.

1. CHRONINT CONTAINS DATA TYPES 1, 2, AND 4 intermediate
2. CHRONFIN CONTAINS DATA TYPES 1, 2, 5, AND 6 final withheld
3. CHRONINT/SC CONTAINS DATA TYPES 1, 2, 3, AND 4 spacecraft
4. CHRONFIN/INT SAME AS 2 BUT WITH DATA TYPE 4 WHEN 5 UNAVAILABLE

CHRONICLE TAPE FORMATS

INTERNAL FORMAT (IED DATA BASE)

6250 BPI BINARY
BLOCKED - MAX BLOCK SIZE 28,886 BYTES

INVESTIGATOR FORMATS

VARIOUS DENSITIES
BLOCKED AND UNBLOCKED

PAD DATA DENOTED BY 99999.0

THE CHRONICLE SCALAR DATA RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: = 1, indicating scalar observations	*L*1
1	Data type of next record	**L*1
2	Spare	--
4	Date of first observation (MJD)	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observation (ms)	R*4
16	Time offset (ms)	R*4
20	Spare	I*4
24	Scalar observations (gammas - 512 values	R*4
2072	Number of points in this record that overlap with the next scalar record	I*2

*8 bit binary value
**On investigator copy only

CHRONICAL TAPE FORMAT - BINARY

TIME ORDERED

FORTRAN READABLE

A. ORBIT DATA RECORD (128 minutes)

B. SCALAR DATA RECORD (512 values)

C. 3 VECTOR COMPONENT DATA RECORDS (1024 values each)

D. ATTITUDE QUALITY (If in fine topocentric coordinates 256-values)

E. ITEMS B-D REPEATED FOR TIME PERIOD OF ORBIT RECORD

F. SEQUENCE A-E REPEATED

G. EOF

Chronfin
D 43245
11/7/79 - 11/15/79

Fine Attitude Data
79-094A-01F/02I

RECORD 1 OF FILE 1
LENGTH = 28886 BYTES

7DDF0000	0C1C0000	00080000	0000ACA0	0522B280	0000EA60	44AC9000	40E1C3F7	C3120C5B	C3224811
C3405238	C3570F38	C36D63E9	C38335B1	C3986AA9	C3ACE9C1	C3C09AD8	C3D366E3	C3653801	C3F5F99C
C4105987	C4114D2E	C4121289	C412CFAF	C41376D0	C414073A	C4148053	C414E1A1	C4152AC4	C4155B7C
C41573A3	C4157330	C4155A37	C41528E9	C414DF90	C4147E92	C4140670	C41377C1	C412D337	C4121999
C4114BC5	C4106AAF	C3F775CC	C3E72E57	C3D5E738	C3C3B403	C3B0A933	C39CDC15	C38862AE	C37353AA
C35DC643	C347D22B	C3318F77	C31B168A	C247FF96	43121882	4328A32B	433EFE4C	43551458	436ACCFA
43801D2E	4394C657	43A8D858	43BC2FA8	43CEB66B	43E0578B	43F0FECB	44100980	4410F137	4411C5D8
44128671	44133217	4413C7F5	44144F80	4414AF80	4414FFFB	44153850	44155828	44155F4B	44154D9A
44152317	4414DFDF	4414842F	4414105F	441384E9	4412E260	44122977	44115AFD	441077DC	43F81192
43E77910	43D5D3A4	43C32A17	43AF967C	4398D019	43860F45	43704D47	436A0439	43434EE3	432C4894
43150D00	C2247E48	C3199A0B	C330C073	C347C647	C35E690D	C3749ABF	C38A40F7	C39F420C	C3B38533
C3C6F29E	C3D9739C	C3EAF2B3	C3FB5BB6	C410A9BE	C4118A1F	C41255E3	C4130C28	C413AC28	C4143538
C414A6C9	C4150059	C41541C2	C4156A9C	C4157ADA	C415727F	C41551A5	C4151887	C414C779	C4145EE7
C413DF5B	C4134975	C4129DEF	C411DD94	C411094D	C4102212	C3309F5F	C31F2A18	C2D8F670	424138F4
431SC19A	43274D9C	4338AAA5	4349C410	435A8599	436AD87B	437AB288	4389F83F	43989AE2	43A53990
43B3B454	43C00C38	43CB8356	43D60CE7	43DF9D4F	43E82A2D	43EFAA5D	43F61606	43FB669C	43FF96E4
44102A2F	44104384	44105459	44104DAF	44103498	44100948	43FCBF47	43F7CF14	43F1CA32	43EAB80D
43E2A12C	43D98F1F	43CF8C7B	43C4A4C7	4388E472	43AC58C2	439F0FC9	4391185S	43828IE0	43735C83
4368B8E4	4353A829	434338E8	43328616	432198F5	43108707	C19D0361	C311C05F	C322D035	C333B9B0
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DUMP OF TAPE MAG1OUT

79/094A-01F/02I
D-43539
1/2/80-1/10/80

INPUT TAPE MAG1OUT ON HT1
DATA INPUT HS NF=2 SR=1=1=1 SR=2 LAST 1 1/2/80

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(360)	441741E4	44180CE0	44188BAF	441954D93	4419C1F1	441A1853	441A5C64	441A69F4	441A64F7	441A4185
(400)	4419FFD8	4419A04D	44192362	441889B6	4417D4CA	4417033A	44161843	4415143B	4413F855	4412C5DD
(440)	44117E35	441022D8	43EB5529	43D3744F	43BAA60D	43A1066B	4386B248	436BC73D	4350637B	4334A5B3
(480)	4318ACF5	C23676CA	C31F77FD	C33B6542	C3570FDD	C37258A6	C38D20CF	C3A74A02	C3C0B67E	C3D94936
(520)	C3FBE5F4	C4107717	C411CD18	C4130ED2	C4143ACB	C4154F9D	43295F96	43250434	43207E81	431BD3BB
(560)	43170946	431224A5	42D2B711	42823539	42312031	C2202C54	C27154B1	C2C1FDA8	C3111CCC	C316068A
(600)	C31AD797	C31F8A8F	C3241A34	C328816B	C32CBB46	C330C308	C334942B	C3382A5E	C33B8195	C33E95FF
(640)	C3416416	C343E89D	C34620A3	C3480988	C349A101	C34AE51B	C34BD43C	C34C6D26	C34CAEFB	C34C993B
(680)	C34C2BCB	C34B66F2	C34A4B5B	C348DA16	C3471496	C344FCB4	C34254AA	C33FDF12	C33CDEE7	C339977E
(720)	C3360C86	C3324202	C32E3C48	C329FFF6	C32591F6	C320F76F	C31C35C6	C3175293	C312539C	C2D3ECBD
(760)	C281A2C4	C22EBDE3	42245EED	42775048	42C9B2DA	4311B23E	4316B41B	431B9AC4	43206057	4324FF1D
(800)	4329718E	432DB258	43318C68	43358AEF	43391967	433C639A	433F65A8	43421C06	4344838C	43469970
(840)	43485B4E	4349C727	434ADB68	434B96E8	434BF8EB	434C011F	434BAFA2	434B04FA	434A021A	4348A85B
(880)	4346F97D	4344F7A4	4342A554	4340056B	433D1B23	4339EA05	43367 5EB	4332C2F9	432ED594	432AB262
(920)	43265E3F	4321DE39	431D378D	43186F99	43138BE0	42E91FB3	42987966	424726C2	C1A7C2FC	C25C135C
(960)	C2AD42FF	C2FDB002	C314D0F5	C319ADB3	C31E6E99	C3230D69	C32784F7	C32BD043	C32FEA7E	C333CF0C
(1000)	C3377988	C33AE5CE	C33E0FF8	C340F467	C3438FC5	C345DF09	C347DF79	C3498EB2	C34AEAA4	C34BF19B
(1040)	C34CA23F	C34CFB98	C34CFD0C	C34CA664	4377F49F	4392EF40	43AD416C	43C6CD64	43DF7669	43F720D7
(1080)	4410DB24	44123119	44137271	44149DCA	4415B1D9	4416AD70	44178F79	441856FD	44190322	4419932B
(1120)	441A0679	441A5C8E	441A9508	441AAFA8	441AAC4F	441A8AFB	441A4BCE	4419EF07	44197509	4418DE52
(1160)	44182B83	44175D5C	441674B9	44157298	4414580F	44132655	4411DEB9	441082A7	43F13A05	43D93401
(1200)	43C0336D	43A65494	438BB4E6	437072DA	4354ADCB	43388506	431C1BB6	C16F64D5	C31CF9FA	C3396265
(1240)	C3558702	C371465D	C38C7F5A	C3A71161	C3C0DC8B	C3D9C1C7	C3F1A30B	C4108637	C411DE77	C413214F
(1280)	C4144D37	C41560C3	C4165AA4	C41739AB	C417FCCA	C418A314	C4192BC1	C419962C	C419E1D7	C41A0E68
(1320)	C41A1BAD	C41A0999	C419D846	C41987F4	C419190A	C4188C13	C417E1BE	C4171ADF	C416386B	C4153B79
(1360)	C414253F	C412F710	C411B25C	C41058AE	C3EEBA6D	C3D6CFE4	C3BDE7FF	C3A4208B	C3899841	C36E6E9F
(1400)	C352C3C4	C336B844	C31A6D02	421FCFA0	431E64AA	433AA92F	4356A9FB	437246F2	438D6090	43A7D809
(1440)	43C18F6C	43DA69C4	43F24B2F	4410918F	4411EB9D	4413315A	44146160	44157A5F	44167B22	4417628E
(1480)	44182FA7	4418E18B	44197778	4419F0C7	441A4CF5	441A8B9A	441AAC6F	441AAF4D	441A942F	441A5B2D
(1520)	441A0482	44199087	4418FFB7	441852AA	44178A1A	4416A6DE	4415A9EB	44149455	4413674A	44122415
(1560)	4410CC1C	43F60DC4	421E29D9	42216B86	4224CBBD	42283EF7	422BBCDB	422F3F50	4232C083	42363AC0
(1600)	4239A94C	423D0716	42404E56	42437813	42467B2C	42494A76	424BD1A1	424DF022	424F737B	42501EBA
(1640)	424FCF62	424E9605	424CB0FE	424A5978	4247B4AA	4244D755	4241CC17	423E985A	423B3F6B	4237C407
(1680)	42342B7E	4230 6F97	422C9292	4228986E	422484CF	422053FA	421CC476	42179AEF	421318DE	41E6B8AB
(1720)	41963E8D	412A1661	00000000	00000000	40A70B9A	418C49E4	41DCAD53	42126CB6	4216E127	421B37B7
(1760)	421F7350	42238BC0	42277AA7	422B42D0	422EE22A	42325BD6	4235A511	4238BB96	423B9E0C	423E4A7E
(1800)	4240BC97	4242EB9E	4244C839	42463B79	424729E7	42477BBB	42472 5C3	42462D09	4244A43F	4242A655
(1840)	4240 4FCB	423DB9B0	423AF7C9	42381928	42352916	42322FFD	422F33D4	422C3A4B	4229455B	42265B29
(1880)	42236F6E	42208708	421DA6EC	421AD46E	421816B9	421579BF	4213137B	42110547	41F7EB57	41EB57B9
(1920)	41ED089B	41FCF5FD	42118ED8	4213DF9D	42169595	42198FBE	421CB794	421FFE40	42235BF3	4226C25C
(1960)	422A2BD6	422D94A0	4230F8A5	423452A7	42379F09	423ADA53	423DFF79	424107D6	4243EA9F	42469B72
(2000)	424907F6	424B1473	424C98EF	424D62F7	424D4D90	424C5917	424AA558	42486EB5	4245D0B3	4242EA4D
(2040)	423FCD76	423C8653	42391D78	4235990D	4231FD96	422E4B5D	422A891D	4226B7C7	4222D865	421FE30C
(2080)	42112094	42110FB2	4210FD68	4210E963	4210D39D	4210BABF	42109E78	42107DD0	42105772	42102980
(2120)	41FF145E	41FAACA1	41F502CB	41ED889E	41E37F25	41D61575	41C51C65	41B22D42	41A062CE	4191EAF7
(2160)	4186FC5E	417EDA9D	4178B82C	4173F99B	41703578	416D2441	416A95D1	416868F1	41668632	4164DCA6
(2200)	41635FCA	4162062B	4160C880	415FA10B	415E8B2D	415D831D	415C85AA	415B9014	415A9FEB	4159B2F9
(2240)	4158C727	4157DA6E	4156EAC8	4155F617	4154FA1A	4153F452	4152E1EE	4151BFA4	4150898F	414F3AF4
(2280)	414DCDF6	414C3B32	414A7927	41487B64	41463149	41438439	414054D0	413C76C4	4137AADC	413196B2

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( 10160)  C4A2D5C2  C4A2D5BF  C4A2D5B9  451869F0  C4A2D4CA  C4A2D3C7  C4A2C3F7  451869F0  C4A2D2F2  C4A2D2F5
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( 10240)  C4A2D03C  C4A2D019  C4A2CF26  451869F0  C4A2CE3A  C4A2CE3D  C4A2CE41  C4A2CD48  C4A2CD38  C4A2CC35
( 10280)  C4A2CC12  C4A2CB0F  C4A2CB0F  C4A2CB39  C4A2CA67  C4A2CA97  C4A2CA95  C4A2CA98  C4A2C99C  451869F0
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( 10360)  C4A2C59B  C4A2C4D3  C4A2C4C7  C4A2C3CD  C4A2C3CD  451869F0  C4A2C2BB  C4A2C2BB  C4A2C2E5  451869F0
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( 10440)  C4A2BF36  C4A2BF53  C4A2BE41  C4A2BE71  C4A2BD6E  451869F0  C4A2BC79  C4A2BC7C  C4A2BC76  C4A2BB7D
( 10480)  C4A2BB7D  C4A2BB7A  C4A2BA87  C4A2BA81  C4A2BAA2  C4A2B9B2  C4A2B9B6  C4A2B9B0  C4A2B8B6  C4A2B8C0
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( 10560)  C4A2B521  C4A2B525  C4A2B52F  C4A2B43F  C4A2B433  C4A2B43C  C4A2B440  451869F0  C4A2B341  C4A2B227
( 10600)  C4A2B221  451869F0  C4A2B152  C4A2B173  C4A2B17C  C4A2B0A0  C4A2B09E  C4A2B08A  C4A2AF91  C4A2AF81
( 10640)  C4A2AE88  C4A2AE95  C4A2AD9C  C4A2ADBD  C4A2ADB7  C4A2ACC4  C4A2ACC7  451869F0  C4A2ABD5  C4A2ABDF
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( 10840)  C4A29E9C  C4A29E90  C4A29E80  C4A29DAA  C4A29DAE  C4A29DD8  C4A29D06  C4A29CE9  C4A29BCC  C4A29BED
( 10880)  C4A29C14  C4A29B42  C4A29B45  C4A29B3F  C4A29A50  C4A29A59  C4A29981  C4A29984  C4A299AB  C4A299DF
( 10920)  C4A299E3  C4A298EA  C4A298ED  C4A29914  C4A29832  C4A29859  C4A29873  C4A297A7  C4A297D2  C4A297F2
( 10960)  C4A2972A  C4A2975A  C4A2977F  C4A296BC  C4A296C0  C4A295C7  C4A295E1  C4A29608  451869F0  451869F0
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( 11200)  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C
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( 11360)  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C
( 11400)  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C
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( 11480)  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C
( 11520)  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C  1B9C1B9C
( 11560)  1B9C1B9C  1B9C1B9C  1B9C

          FILE    INPUT      DATA RECORDS      MAX.          READ ERROR SUMMARY              INPUT RETRIES
                  RECS.        INPUT           SIZE       PERM  ZERO B  SHORT  UNDEF.  #RECS.  TOTAL#
            2      2676        2677           28886         0      0      0      0       0      0

EOJ         DUMP STOPPED AFTER FILE   2          # OF PERMANENT READ ERRORS  0

START TIME 07/30/87  18:24:04        STOP TIME 07/30/87  18:29:02

1/10/80

$$
$ASS IN HTC OUT HT1
$EXEC TPDUPC BS
```

MAGSAT

INV-B (INVESTIGATOR-B) DATA

79-094A-01G, 02J SPMS-00470

THESE DATA SETS HAVE BEEN RESTORED. ORIGINALLY THERE WERE FIVE D AND SEVEN C TAPES AT 9-TRACK, 6250 BPI WRITTEN IN BINARY. THE D AND C TAPES WERE RESTORED SINCE THE TWO SETS ARE DIFFERENT, THE D TAPES WERE BLOCKED AND THE C TAPES WERE UNBLOCKED. THERE ARE 12 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 AND WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D AND C NUMBERS AND THE TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#/C#	FILES	TIME SPAN
DR004921	DS004921	D043683	1	11/02/79 - 01/19/80
DR004922	DS004922	D046265	1	01/19/80 - 03/27/80 (a)
DR004923	DS004923	D046266	1	03/26/80 - 05/19/80
DR004924	DS004924	D047246	1	05/20/80 - 06/09/80
DR004925	DS004925	D047247	1	06/09/80 - 06/10/80
DR004926	DS004926	C021745	1	11/02/79 - 12/16/79
DR004927	DS004927	C021746	1	12/16/79 - 01/19/80
DR004928	DS004928	C021749	1	03/26/80 - 05/19/80
DR004929	DS004929	C021747	1	01/19/80 - 03/16/80
DR004930	DS004930	C021748	1	03/16/80 - 03/27/80
DR004931	DS004931	C021750	1	05/20/80 - 06/09/80
DR004932	DS004932	C021751	1	06/09/80 - 06/10/80

(a) ERRORS OCCURRED IN RECORDS 23 & 29, FILE 1

REQ. AGENT
DEW

RD #

ACQ. AGENT
HKH

MAGSAT

79-094A-01G/02J

INVESTIGATOR B TAPE

This data set consists of 5 'D' tapes and 7 'C' tapes. The tapes are 9-track, 6250 bpi, with 1 file of data. The 'C' tapes are unblocked. The tapes were created on an IBM 360 computer. The 'D' and 'C' numbers and time spans are as follows:

D#	C#	Files	Time Span
D-43683	C-21745	1	11/02/79 - 12/16/79 —
	C-21746		12/16/79 - 01/19/80 —
D-46265	C-21747	1	01/19/80 - 03/16/80
	C-21748		03/16/80 - 03/27/80
D-46266	C-21749	1	03/26/80 - 05/19/80
D-47246	C-21750	1	05/20/80 - 06/09/80
D-47247	C-21751	1	06/09/80 - 06/10/80

Note on Magsat Investigator-B Tape Format Descriptions

7/21/93
H. Kent Hills

The Magsat project documents described their output tape format, which was an IBM labeled format, namely VBS, which uses an extra 4 bytes to indicate the block size, and an extra 4 bytes for the length of each logical record. Because of the VBS structure, and the fact that the Magsat data has records of two different sizes, the VBS structure can be awkward to handle in non-IBM systems. The NSSDC distributes tapes in unlabeled format. In this case, the records are of length 2228 bytes for the header records and 3024 for the data records (which are the logical record lengths without counting the 4-byte control words used in IBM VBS format). When generating the program to read the tape, the user may need to first determine the record length, or check the record type value contained in each record, to know which type of record is being read and proceed accordingly. The record type value for the next record is also included in each record, and can be useful in efficient processing of the tape.

The tape format contained in "Magsat Investigator-B Tape User's Guide," CSC/TM-82/6058, approved 2/25/82 is correct, but the warning above regarding record format still applies.

MAGSAT INVESTIGATOR-B TAPE

USER'S GUIDE

Prepared for

GODDARD SPACE FLIGHT CENTER

By

COMPUTER SCIENCES CORPORATION

Under

Contract NAS 5-24391
Task Assignment 5025

Prepared by:

Roseville B. Abrams 2/25/82
R. Abrams Date

Brook L. Gilson 2/25/82
B. Gilson Date

Approved by:

K. C. Leung 2/25/82
Dr. K. C. Leung Date
Department Manager

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SECTION 1 - INTRODUCTION

The Investigator-B tape contains observed and theoretical magnetic field values, related scientific parameters, and satellite position data from the Magnetic Satellite Mission (MAGSAT). The observed magnetic data were collected on the MAGSAT satellite from November 2, 1979, to June 11, 1980, by a cesium vapor magnetometer, a fluxgate (vector) magnetometer (see Reference 1), an associated attitude determination instrument, and other supporting instruments. These data were received through the National Aeronautics and Space Administration (NASA) Space Tracking and Data Network (STDN) and transmitted to the Goddard Space Flight Center (GSFC) where the Information Processing Division (IPD) sorted the measurements and relayed them to the appropriate people.

In addition, the satellite was tracked by the Defense Mapping Agency (DMA) Doppler network. These data were processed and definitive orbits determined by personnel at the Johns Hopkins Applied Physics Laboratory (APL) who then furnished the completed ephemeris tapes to GSFC.

Attitude data were analyzed by the Attitude Determination and Control (ADC) Section at GSFC and then sent, via IPD, to the Project in the form of quaternions. Attitude data are of two varieties. The first, called intermediate attitude, is derived from the horizon scanner and sun sensor. Its accuracy, after processing, is on the order of 10-20 arcmin. The second, called fine attitude, is derived from two star cameras, the fine Sun sensor, the attitude transfer system (ATS), and a pitch gyro. The mission goal for the vector measurement accuracy was 20 arcsec.

There are a total of four Investigator-B tapes with the following tape names and MAGSAT data.

IBM002	November 2, 1979 - January 18, 1980
IB0005	January 19, 1980 - March 26, 1980
IB1004	March 27, 1980 - May 19, 1980
IB2003	May 20, 1980 - June 9, 1980

They are written by an IBM System 360/91 computer in computer compatible tape format with the following characteristics:

- Record Format - Variable length blocked and spanned (VBS)
- Maximum Logical Record Length - 3028 bytes (8 bits per byte)
- Maximum Block Size - 30,000 8-bit bytes
- Tracks - 9
- Density - 6250 bits per inch (BPI)
- Data Set Name on IBM Standard Label - INVB

Each tape contains 3 files. The first file constitutes a standard IBM tape header label. The second file contains all the data. The last file constitutes an IBM standard trailer for a labeled tape.

For IBM users, a sample data definition (DD) statement follows:

```
//FT20F001 DD DSN=INVB, VOL=SER=IB0005, UNIT=9TRACK,
//  LABEL=(1,SL), DCB=(RECFM=VBS, LRECL=3028, BLKSIZE=30000,
//  DEN=4)
```

Data are organized by individual satellite passes. The start of the pass is defined as the point at which the satellite changes from south-going to north-going (i.e., the southernmost point). The pass numbers are assigned consecutively beginning with the first partial orbit which is labeled one. If a pass contains no data, it does not

appear on the tape and its number is skipped. Each pass contains two types of records, header records and data records. Each pass has exactly one header record which contains information required only once per pass. In addition to the header record, there are several data records covering the entire pass. Each data record contains 30 data points spaced at approximately 5-second intervals, corresponding to 2.5 minutes of data.

SECTION 2 - TAPE FORMATS

Tables 2-1, 2-2, and 2-3 describe the formats which define the Investigator-B tape. Table 2-1 describes the header record format, Table 2-2 gives the data record format, and Table 2-3 expands the time ordered array portion of the data record. The time ordered array begins at a displacement of 24 bytes from the beginning of the data record. There are 25 different quantities at 30 points in time separated by equal increments of approximately 5 seconds.

In these tables, the heading LOCATION refers to the displacement of the data in bytes (8 bits per byte) from the start of the record. The comment array (COMM) in the header record contains 120 bytes of EBCDIC characters.

The attitude quality word (QUAL) described in Table 2-3, are stored in alternating 2 byte integers in the IBM format. The value appears in the rightmost 2 bytes; the leftmost bytes are zero filled. All remaining data are in IBM binary format either as 4 byte integers (denoted by I*4) or as 4 byte floating point real numbers (denoted by R*4).

Unless otherwise stated, all references to X, Y, and Z components of the measured magnetic field in this document refer to NEV coordinates with X corresponding to North, Y to East and Z to Vertical (down). Also, all values of measured magnetic field are expressed in gammas (one gamma equals one nanotesla, that is, 10^{-9} weber per square meter). All references to the modified Julian day refer to the Julian day minus 2,400,000. Using this definition, the Modified Julian Day 44179 represents November 2, 1979. Ascending node refers to the point where the satellite crosses the equator in a northerly direction; descending node refers to an equator crossing in a southerly direction.

The following values at the node are not calculated whenever there are no data points within 45° latitude of the node (equator) on either or both sides: milliseconds of day (MSECX), longitude (ALONX), local mean Sun time (ALTMX), magnetic acitivity index (IKP), and disturbance storm time (DST). In addition the external field E and the associated induced field I at the node are not computed whenever there is no data point within 5° latitude of the node on either or both sides or there are less than 20 points within 45° latitude of the node.

Unavailable data in all records are padded with the value 99999.0 with the following exceptions: the times at the node are padded with -99999; and attitude quality words are padded with 0 in the first two bytes and 9999 in bytes 3 and 4.

Table 2-1. Description of Header Record Variables

VARIABLE	LOCATION	TYPE	DESCRIPTION
ITYPEX	0	I*4	A flag set to 1 to designate this as a header record.
NTYPEX	4	I*4	A flag which is equal to 1 if the succeeding record is a header record and equal to 2 if the next record is a data record.
MJDX	8	I*4	The modified Julian day at the start of the pass. i.e., when the satellite turns northward--true even if the first piece of available data in the pass is on the next day.
IPASSX	12	I*4	Pass (orbit) number. Pass numbers will be assigned consecutively beginning from the first partial orbit which will be labeled 1. The designation of the start of a pass is the point at which the satellite changes from south-going to north-going.
ASCX(2)	16	R*4	External field E and associated induced field I at the ascending node (see Section 3.1 for the computations of E & I).

Table 2-1. Description of Header Record Variables (Cont'd.)

VARIABLE	LOCATION	TYPE	DESCRIPTION
DSCX(2)	24	R*4	E, I at descending node
MSECX(2)	32	I*4	Milliseconds of day at Ascending Node (first number) and Descending Node (second number)
ALTMX(2)	40	R*4	Local Mean Sun time (in hours) at Ascending Node (first number) and Descending Node (second number)
ALONX(2)	48	R*4	Longitude in degrees at Ascending Node (first number) and Descending Node (second number)
IKP(2)	56	I*4	Coded version of the Magnetic Activity Index, K_p, at Ascending Node (first number) and Descending Node (second number). See Section 3.2 for the definition of IKP.
GSM(2,3)	64	R*4	Spare
DST(2,6)	88	R*4	Disturbance Storm Time coefficients. (Section 3.3 describes the computation of DST). DST (1,J) is at Ascending Node DST (2,J) is at Descending Node $D(T)=A_o(T) + \sum_{n=1}^{2} A_n(T) \sin (nt + \alpha_n (T))$

Table 2-1. Description of Header Record Variables (Cont'd.)

VARIABLE	LOCATION	TYPE	DESCRIPTION
			where A_o = DST (I,1) A_1 = DST (I,2) α_1 = DST (I,3) A_2 = DST (I,4) α_2 = DST (I,5) D(T) = DST (I,6) T is the universal time and t is the local time. NOTE: A_o corresponds to DST, D(T) is the total equatorial distrubance in the radial component (H) at (T,t).
COMM(30)	136	EBCDIC	Comments relating to the field model.
NMAX*	256	I*4	Maximum value of subscripts in GH (see below in this table).
NMAXT**	260	I*4	Maximum value of subscripts in GHT (see below in this table).
MODEXT	264	I*4	If MODEXT = 1 an exterior field is present in the field model.
TZERO	268	R*4	Epoch time at which coefficients of field model are valid.

Table 2-1. Description of Header Record Variables (Cont'd.)

VARIABLE	LOCATION	TYPE	DESCRIPTION
ABAR	272	R*4	Mean Earth radius in kilometers for field model calculation.
GH(17,17)*	276	R*4	Field model coefficients in gammas for g(nT) and h(nT). GH (n,m) = g_n^m GH (m-1,n) = h_n^m
GHT(14,14)**	1432	R*4	Time derivatives of GH ($\frac{\text{gammas}}{\text{year}}$).
EX(3)	2216	R*4	Components of the Earth's external field in Earth-centered Cartesian coordinates.

*In the model used to form the Investigator-B tapes, only a 14-by-14 GH subarray is actually used. GH values for n or m greater than 14 are zero filled.

**In the model used to form the Investigator-B tapes, only an 8-by-8 GHT subarray is actually used. GHT values with subscripts greater than 8 are zero-filled. This implies that values of GH with subscripts between 9 and 14 inclusive are time-independent.

Table 2-2. Description of Data Record Variables

VARIABLE	LOCATION	TYPE	DESCRIPTION
ITYPEB	0	I*4	A flag set to 2 designating a data record.
NTYPEB	4	I*4	A flag denoting type of next record. NTYPEB equals 1 if the next record is a header record, 2 if the next record is a data record.
MJDB	8	I*4	The modified Julian day of the first point in this data record.
MSECB	12	I*4	Time of day (msec) for the first point in the data record.
IPASSB	16	I*4	The current pass number.
TINTB	20	R*4	Time interval (msec) between data points in data record.
DATA(30,25)	24	R*4	Data values for 25 variables at 30 points in time (see Table 2-3).

Table 2-3. Description of Data Values DATA(30,25) in Data Record

VARIABLE	LOCATION	TYPE	DESCRIPTION
LAT	24	R*4	The geocentric latitude of the spacecraft in degrees at this data point.
LONG	144	R*4	The geocentric longitude (range ± 180) of the spacecraft in degrees at this data point.
RAD	264	R*4	The geocentric radius (in kilometers) of the spacecraft orbit at this data point.
MLT	384	R*4	Magnetic Local Time in hours.
INVLAT	504	R*4	Invariant latitude in degrees (see Section 3.4)
DIPLAT	624	R*4	Dip latitude in degrees (see Section 3.5)
BS	744	R*4	Magnitude of measured magnetic field from scalar data in gammas. (see Section 3.6).
BV	864	R*4	Magnitude of measured magnetic field from vector data in gammas (see Section 3.6)

Table 2-3. Description of Data Values DATA(30,25) in Data Record (Cont'd.)

VARIABLE	LOCATION	TYPE	DESCRIPTION
X	984	R*4	X component (in NEV coordinates) of measured magnetic field in gammas (see Section 3.6)
Y	1104	R*4	Y component (in NEV coordinates) of measured magnetic field in gammas (see Section 3.6).
Z	1224	R*4	Z component (in NEV coordinates) of measured magnetic field in gammas (see Section 3.6).
BVA	1344	R*4	The average of the magnitude of measured magnetic field in gammas (obtained from vector data) for the original observed points corresponding to this data point.

Table 2-3. Description of Data Values DATA(30,25) in Data Record (Cont'd.)

VARIABLE	LOCATION	TYPE	DESCRIPTION
XA	1464	R*4	The average of the (X, Y, or Z) component of the measured magnetic field in gammas (in NEV coordinates) for the original observed points corresponding to this data point (see Section 3.6).
YA	1584	R*4	
ZA	1704	R*4	
BVSD	1824	R*4	BVSD, XSD, YSD, and ZSD are coded variables related to the measured vector magnetic field and its X, Y, Z components (in NEV coordinates) respectively. Each variable is represented by a signed floating point number to be interpreted as follows: • The fractional part is the slope (in gammas/millisecond δ), multiplied by 10, of the least square line fitted to the original observed values used to compute this average point.
XSD	1944	R*4	
YSD	2064	R*4	
ZSD	2184	R*4	

Table 2-3. Description of Data Values DATA(30,25) in Data Record (Cont'd.)

VARIABLE	LOCATION	TYPE	DESCRIPTION
			• The integer part is the standard error of the linear fit (in gammas) multiplied by 10. • The sign of the coded variable is the sign of the slope (see Section 3.6).
BMD	2304	R*4	Magnitude of magnetic field predicted from the spherical harmonic model whose coefficients appear in GH and GHT of the header record (see Section 3.7).
XMD	2424	R*4	X component (in NEV coordinates) of magnetic field in gammas predicted by model (see Section 3.7).
YMD	2544	R*4	Y component in NEV coordinates of magnetic field in gammas predicted by model (see Section 3.7).
ZMD	2664	R*4	Z component (in NEV coordinates) of magnetic field in gammas predicted by model (see Section 3.7).

Table 2-3. Description of Data Values DATA(30,25) in Data Record (Cont'd).

VARIABLE	LOCATION	TYPE	DESCRIPTION
QUAL	2784	I*4	Attitude Quality Word - Appears in last 2 bytes of word in integer format. Bytes 1 and 2 of the word are set to 0 (see Section 3.8).
SPARE	2904		

SECTION 3 - DETAILED DESCRIPTIONS OF VARIABLES

The following quantities from Tables 2-1 to 2-3 are discussed in more detail below: the external field (E), the associated induced field (I), the magnetic activity index (IKP), disturbance storm times (DST), invariant latitude, dip latitude, measured field values and associated statistical parameters (in Table 2-3), model field values (BS, BV, X, Y, and Z in Table 2-3) and the attitude quality (QUAL).

3.1 COMPUTATION OF E AND I

Estimates of the external fields (ASCX(1) and DSCX(1)) due to the ring-current and other magnetic currents and the associated induced fields (ASCX(2) and DSCX(2)) are derived from the resultant of the vector data as follows:

a) Derive ΔB = B (measured) - B (computed) for all data within $\pm 45°$ latitude of the equator. B (computed) is taken from the spherical harmonic analysis whose coefficients are included in the header record (variables GH and GHT).

b) Assume that for each half orbit ΔB is the perturbation due to a potential function of the form

$$V = [(r/a)\ E + (a/r)^2\ I]\ \cos\ \phi$$

where a = 6371.2 km (mean Earth radius)

r = radial distance to data point from the center of Earth

$\phi = 90° - \sigma$

σ = the dip latitude (see Section 3.5)

then $\vec{\Delta B} = -\vec{\nabla} V$ where the symbol ∇ denotes the gradient.

From these equations E and I are found by a non-linear least square procedure. The term associated with "E" represents the external field while the term associated with "I" represents the induced field. "E" and "I" are computed each half-orbit and should be associated with the time and position of the ascending and descending nodes.

3.2 MAGNETIC ACTIVITY INDEX (IKP)

The magnetic activity index (planetary index) K_p is proportional to the logarithm of the variation of the magnetic field. Thus, K_p is a measure of the degree of magnetic disturbance. K_p values consist of an integer followed by a -, 0, or + sign. IKP is the coded version of K_p. IKP = $10K_p + 3n$ where n is -1, 0, or +1 depending on whether the K_p value is -, 0, or + respectively.

3.3 DISTURBANCE STORM TIME (DST)

The disturbance storm time coefficients, DST(1,1)...DST(1,5) for the ascending node and DST(2,1)...DST(2,5) for the descending node were supplied by Dr. M. Sugiura of the Goddard Space Flight Center. Values for D(T) are calculated at each node by the following formula

$$D(T) = A_o(T) + \sum_{n=1}^{2} A_n(T) \sin (nt + \alpha_n(T))$$

where A_o, A_1, A_2, α_1, and α_2 are DST coefficients for the appropriate node. A_o, A_1, and A_2 are in gammas, and α_1 and α_2 are in degrees. T is the universal time and t is the local time. $A_o(T)$ is equivalent to the traditional DST while $\sum_{n=1}^{2} A_n(T)\sin\{nT+\alpha_n(T)\}$ should be an approximation to the traditional DS. For these calculations data from the five observatories Honolulu, San Juan, Hermanus, Alibay, and Kakioka were utilized. As of this writing, the secular variation has not yet been accounted for, which can result in a baseline shift of a few gammas.

3.4 INVARIANT LATITUDE (INVLAT)

The invariant latitude is the inverse cosine of the reciprocal of the McIlwain shell paramter.

3.5 DIP LATITUDE (DIPLAT)

The dip latitude (λ) at a location is the angle that a magnetized needle makes with the horizontal axis at that location.

$$\lambda = \text{Arctan}\left(\frac{0.5Z}{\sqrt{X^2 + Y^2}}\right)$$

Where X, Y, and Z are the field components (in NEV coordinates) obtained using a Schmidt-normalized spherical harmonic field model.

3.6 MEASURED FIELD VALUES

Items BS, X, Y, and Z in Table 2-3 are the actual measured field values at the universal time (T) which is specified by the following formula:

$$T = \text{MSECB} + (n-1) * \text{TINTB}$$

where n is the position of the point in the record (ranging from 1 to 30), MSECB is the time of day in milliseconds (see Table 2-2) and TINTB (see Table 2-2) is the time interval in milliseconds between points in the data record. BV is the resultant of X, Y, and Z. Items BVA, XA, YA, and ZA in Table 2-3 represent the average field values of the observations spanning 4915.4 milliseconds centered at time T. If all data are available, the average is over 80 observations. Items BVSD, XSD, YSD, and ZSD in Table 2-3 are coded variables represented by signed floating point numbers which should be interpreted as follows:

- The fractional part is the slope (in gammas/millisecond), multiplied by 10, of the least square line fitted to up to 80 original observations included in the average.

- The integral part is the standard error of the linear fit (in gammas) multiplied by 10.
- The sign of the coded variable is the sign of the slope.

3.7 MODEL FIELD VALUES

Items BMD, XMD, YMD, and ZMD in Table 3 are field values calculated using a Schmidt-normalized spherical harmonic model with geocentric coordinates. The significant parameters of the model are described in the header record (see Table 2, locations 136-2216). The calculated field values, XMD, YMD, and ZMD at the epoch time t_o (see Table 2, TZERO) are given by the following equations

$$XMD = \sum_{n=2}^{k} \sum_{m=1}^{n} \left(\frac{a}{r}\right)^{n+1} \cdot \left(g_n^m \cos(m-1)\lambda + h_n^m \sin(m-1)\lambda\right) \cdot \frac{d}{d\theta} P_{n-1}^{m-1}(\cos\theta) \quad (2)$$

$$YMD = \sum_{n=2}^{k} \sum_{m=1}^{n} \left(\frac{a}{r}\right)^{n+1} \frac{-m+1}{\sin\theta} \cdot \left(- g_n^m \sin(m-1)\lambda + h_n^m \cos(m-1)\lambda\right) \cdot P_{n-1}^{m-1}(\cos\theta) \quad (3)$$

$$ZMD = \sum_{n=2}^{k} \sum_{m=1}^{n} (-n) \left(\frac{a}{r}\right)^{n+1} \cdot \left(g_n^m \cos(m-1)\lambda + h_n^m \sin(m-1)\lambda\right) \cdot P_{n-1}^{m-1}(\cos\theta) \quad (4)$$

where k is the degree (see Table 2, NMAX), r is the radial distance from the origin (see Table 3, RAD), a is the mean radius of the earth (see ABAR, Table 2), θ is the colatitude, the complement of the latitude, (see Table 3, LAT), λ is the east longitude measured from Greenwich (see Table 3, LONG), $P_n^m(\cos\theta)$ is an associated Lengendre polynomial (Schmidt-normalized type) of degree n and order m.

$$P_n^m(\mu) = \frac{1}{2^n\, n!} \left(\frac{\varepsilon_m\, (n-m)!\, (1-\mu^2)^m}{(n+m)!} \right)^{1/2} \frac{d^{m+n}(\mu^2-1)^n}{d\mu^{m+n}}$$

where $\mu = \cos\theta$, $\varepsilon_m = 1$ for $m = 0$ and 2 for $m > 0$,

and where g_n^m and h_n^m are the field model coefficients (see Table 2, GH)

The value of XMD, YMD, and ZMD at any time t is obtained by using the time derivatives GHT (see Table 2) to adjust g_n^m and h_n^m to the time t as follows:

$$g_n^m(t) = g_n^m(t_o) + GHT(n,m) * (t-t_o)$$

$$h_n^m(t) = h_n^m(t_o) + GHT(m-1,n) * (t-t_o)$$

where t and t_o are measured in years. The adjusted values for $g_n^m(t)$ and $h_n^m(t)$ are then substituted in Equations 2-4.

3.8 ATTITUDE QUALITY

The attitude quality flag abcde is a five digit number defined as follows:

Character	Description
a	Smoothing character (level of smoothing of final attitude):
	=0, no smoothing
	=1, linear smoothing
	=2, nonlinear smoothing
b	Residual character:
	=0, all residuals within boundaries
	=1, QUEST residual and SC1 acceptable, SC2 bad
	=2, QUEST residual acceptable, SC1 bad, SC2 acceptable
	=3, QUEST residual acceptable, SC1 and SC2 bad
	=4, QUEST residual bad, SC1 and SC2 acceptable
	=5, QUEST residual bad, SC1 acceptable, SC2 bad

Character	Description
	=6, QUEST residual and SC1 bad, SC2 acceptable
	=7, QUEST residual SC1, and SC2 bad
c	Gyro and ATS character:
	=0, observed gyro point, observed ATS point
	=1, observed gyro point, interpolated ATS point
	=2, observed gyro point, default ATS value
	=3, interpolated gyro data, observed ATS point
	=4, interpolated gyro data, interpolated ATS point
	=5, interpolated gyro data, default ATS value
	=6, gyro data point invalid, observed ATS point
	=7, gyro data point invalid, interpolated ATS point
	=8, gyro data point invalid, default ATS value
d	Attitude computation character (method of final attitude computation):
	=0, with QUEST, using FSS, SC1, and SC2
	=1, with QUEST, using SC1 and SC2
	=2, with QUEST, using SC1 and FSS
	=3, with QUEST, using SC2 and FSS
	=4, using SC1 and gyro
	=5, using SC2 and gyro
	=6, using FSS and gyro
	=7, not computed

Character	Description
e	Pattern matching character: =0, SC1 and SC2 valid, identified =1, SC1 valid, identified; SC2 valid, not identified =2, SC1 valid, identified; SC2 not valid =3, SC1 valid, not identified; SC2 valid, identified =4, SC1 valid, not identified; SC2 valid, not identified =5, SC1 valid, not identified; SC2 not valid =6, SC1 not valid; SC2 valid, identified =7, SC1 not valid; SC2 valid, not identified =8, SC1 not valid; SC2 not valid

In the above list QUEST refers to the attitude determination least squares program (Reference 3).

An acceptable QUEST residual implies that the QUEST solution results in a consistent model of the data.

SC1 and SC2 refer to the two star cameras which are attached to the optical bench on the spacecraft side of the boom. ATS is the Attitude Transfer System which optically connects the optical bench and a set of mirrors attached to the vector magnetometer (on the boom). FSS is the Fine Sun Sensor on the magnetometer.

Comments on the attitude quality flag appear below.

Comments on the Attitude Quality Flag

Character	Comments
a	Self-explanatory
b	Values 0, 1, 2, and 3 indicate that the attitude solution residual is less than or equal to 20". Values 4, 5, 6, and 7 indicate that the attitude solution residual is greater than 20". This flag will always be 7 when a motion model solution is obtained. In that case, it has no meaning.
c	Definition of terms Observed - A measurement was obtained and the measured value was used in the computations. Interpolated - Either a measurement was obtained and the measured value was deemed unacceptable or no measurement was obtained. Consequently a linear interpolated value was supplied and used in the computations. Default - Same as Interpolated except a predetermined default value was supplied and used in the computations. Invalid - The data was deemed invalid if • The telemetry was bad. • The measured value deviated substantially from the mean of the surrounding data.

d QUEST is the name of the program in which the attitude was computed based on information from at least two of the three sensors (SC1, SC2, FSS). An alternate solution method determined attitudes by propagating previous attitudes based on information about the motion of the spacecraft (motion model). A QUEST solution was preferable to the motion model. Information for the motion model consisted of a combination of SC1, SC2, or FSS data plus gyro data with the following priority:

FSS + gyro highest
SC1 + gyro
SC2 + gyro lowest

No attitude was computed if either

- No data from SC1, SC2, and FSS existed.
- Or no attitude from the previous half minor frame was available.

Note that in the Investigator-B data record each attitude quality flag is represented by a two-byte word right justified in a four-byte word. Bytes 1 and 2 are set to zero. When attitude quality values are not available the value 9999 is used as pad.

SECTION 4 - EXCEPTIONS

The first and last Investigator-B tapes are slightly different than the others. The following is a list of special considerations.

1. The first tape (November 2, 1979 - January 18, 1980) contains not only fine attitude data but also intermediate attitude data which is identifiable by an attitude flag of 9999.

2. On the last tape (May 20, 1980 - June 9, 1980) all data are intermediate attitude. On the second (January 19, 1980 - March 26, 1980) and the third (March 27, 1980 - May 19, 1980) tapes all data are fine attitude.

3. On the first tape, on the first record of some orbits (about one out of fifteen) an isolated spurious point exists. A list of these points is under preparation.

4. On the first tape the values BVSD, XSD, YSD, and ZSD (see Table 3) are the standard deviations of the measured vector magnetic field and the X, Y, and Z components respectively rather than the coded variables described in Table 3. BVSD, XSD, YSD, and ZSD are still, however, four-byte floating point real numbers in the IBM format.

APPENDIX A - SAMPLE PRINTOUT

A dump of a typical Investigator-B header record in hexidecimal characters appears in Figure A-1; Figure A-2 contains a dump for a typical data record. The dumps should be read row-by-row across the page. Actual corresponding values for the header record are listed in Tables A-1, A-2, and A-3, and for the data record in Tables A-4 and A-5.

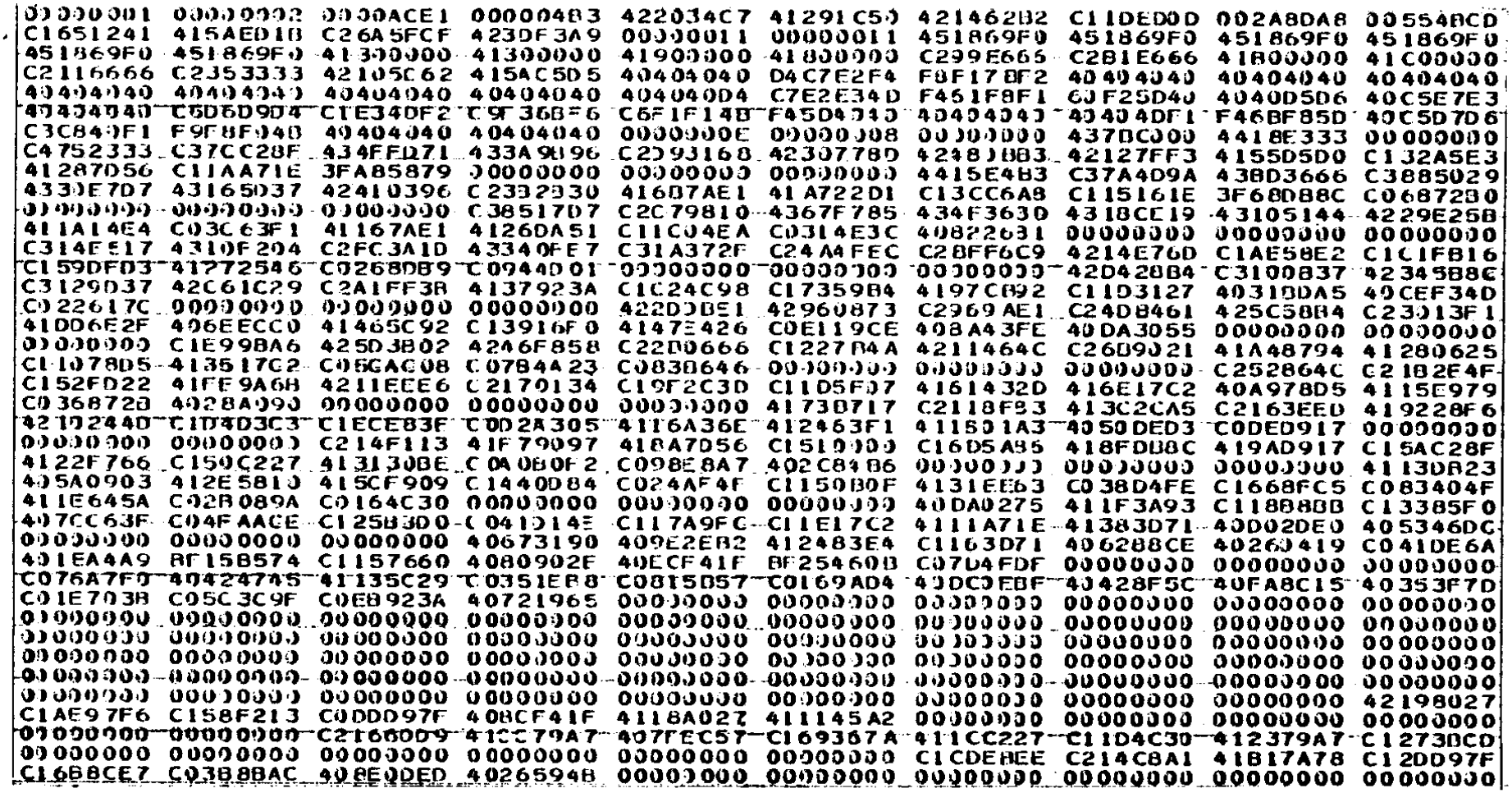

Figure A-1. Header Dump

```
413F295F 411404EA C195CFA8 C0751828 40BFF2E5 C134EA4B 40BF1412 40A617C2 00000000 00000000
00000000 00000000 00000000 00000000 C0685F07 C11BA512 415B6851 C140CE70 C172CFAB 4118A858
40E5D639 C0B0E0E8 00000000 00000000 00000000 00000000 00000000 00000000 4111E2E8 4118096C
C11EE2E8 4138E3BD 40A00000 C1295357 40407803 C11A978D 00000000 00000000 00000000 00000000
00000000 00000000 C11892A3 C1284C30 C0BDC5D6 41126A7F 409D566D 413D7732 C1156944 411664C3
00000000 00000000 00000000 00000000 00000000 00000000 C11476C9 40F10CB3 40FD844D C03ED289
C0816F00 C0AF3864 411CC77A 41176DC6 00000000 00000000 00000000 00000000 00000000 00000000
01000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
01000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
01000000 00000000 00000000 00000000 451869F0 451869F0 451869F0
```

Figure A-1. Header Dump (Continued)

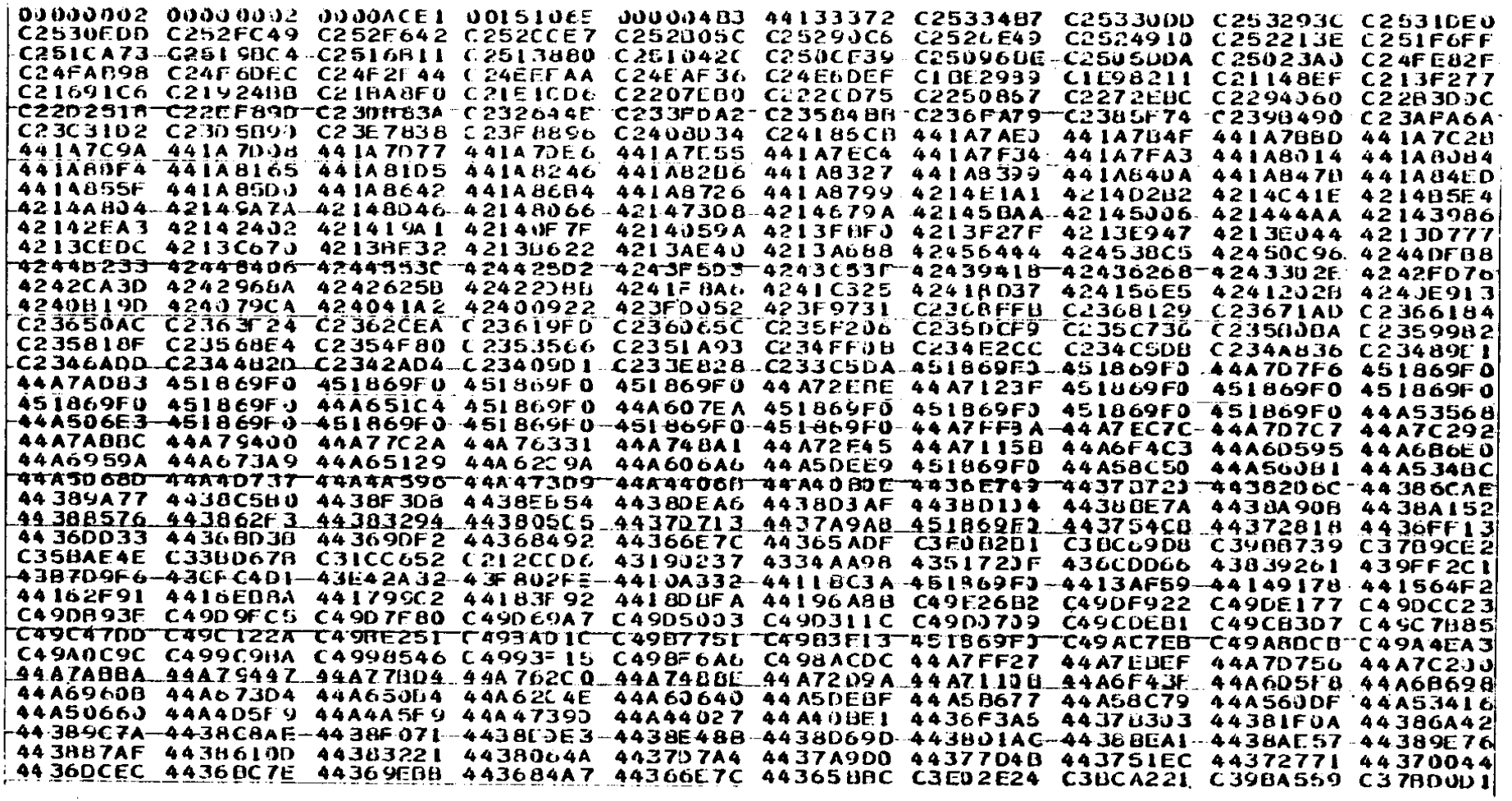

Figure A-2. Data Record Dump

```
C35BED9D C33C4D0E C31DT83B C2143A9E 431F9FA5 43351432 435TC6C2 436C985C 43840E67 439EF6E2
43B7D367 43CF6D41 43E41296 43F7DA20 4410A1BD 4411BC2D 44128B34 4413AC09 44148FCE 441563F4
44162BEC 4416EC31 44179990 44183EFA 4418DABC 441967A5 C49E2259 C49DF960 C49DE153 C49DCCD3
C49DB820 C49D9E8E C49D7F15 C49D680E C49D4D71 C49D2F1A C49DD62D C49CDE25 C49CB1C8 C49C7D1D
C49C4751 C49C137C C49BE207 C49BACCE C49B76BB C49B3DCC C49B04AE C49AC96F C49A8C6E C49A4DA7
C49A0D0D C499C88B C4998A7B C4993EE9 C498F680 C498ADEB C1609137 C1609A15 C160A17F C170A97E
C160B7A2 C160BF63 C160C48D C160CA2D C160D409 C15DDC3D C170E018 C160EEA4 C160FD21 C1610200
C1610CC7 C17112AB C1611E55 C16129DE C16138F8 C1614674 C1615027 C1615757 C1716251 C1716C3D
C171782C C1718D1E C16192BA C1619BC6 C161A787 C161B25B 424B68CE 42484F42 42242D7B 421F1F37
42511844 42331113D 421F12B3 C21A054E C232009C C21FDADF C214041F C2100908 C21C0F59 C213098D
C21E13E6 C1E15205 C1A185EE C1717660 C1318335 C1417C78 C1517203 C2141419 C2121397 C1C14A83
C1411895 C140FF9F C140E989 C13DC9CD C140AC38 C1508AED 4250FFBE 4240FFBE 4216FFBE 419FFBE7
423CFFBE 4228FFBE 4223FFBE 421CE354 4283EF2A 4253CB67 4233F878 4230D30F 4247CA72 423EDCD5
42788407 4228B855 41AAE169 42139C7E 416963DD 42118BAC 41D821AA 42107AD3 41972416 4186A750
41F6658D 41B5E38D 41B5A6D8 41352036 4184E9A4 4174656F 42171438 4217116E 41D0AEB8 41B09690
421F0D88 42160CDE 41A1103F 41D0B6DF 42161090 41F0F320 41B15FFB 41A16006 421115FC 41A1BDD5
4211T7A3 4181A747 4171A2AA 4171B346 4171C28D 4161D48C 4171DE34 41A1F559 41A2013B 4191FFCA
41621D72 4162254F 41523EDC 41624746 416257A6 41626D01 44A7F2D6 44A7E016 44A7CD1F 44A7B91D
44A7A413 44A78DE7 44A776BB 44A75E5E 44A744E2 44A72A36 44A70E4F 44A6F132 44A6D2DB 44A6B356
44A69280 44A6705A 44A64CE0 44A62827 44A60215 44A5DAA8 44A5B1DC 44A5878C 44A55C34 44A52F42
44A500E6 44A4D129 44A4A003 44A46068 44A4395C 44A403ED 44367140 44370A88 44378ECA 4437FE17
44385857 44389E24 4438D2A4 4438F5DE 443907CA 4439087A 443905D3 4438F46D 4438D9B4 4438B7EA
44389281 44386979 44383CCC 44380E74 4437E0C0 4437B3A8 44378727 44375C33 443733FD 44370E7E
4436EBB2 4436C8FA 4436AFC6 44369703 44368104 44366FF4 C3E5DE29 C3C3F48D C3A22A9E C3807CD6
C35EEF4C C33DF8D5 C31DE1E2 42156710 431FADBB 433CE0E1 4358D83D 437391F9 438D10E4 43A54205
43BC336C 43D1E595 43E6590 43F997DF 4410DC21 4411CD85 4412CDC9 4413BDC9 44149FFD 44157467
44163B13 4416F4E5 4417A3F8 44184879 4418E256 44197238 C49E39AD C49E1F21 C49E0325 C49DE5B5
C49DC6D5 C49DA673 C49D8484 C49D6104 C49D38F7 C49D1545 C49CECE5 C49CC2DB C49C9723 C49C69C4
C49C3A9B C49C09AD C49BD6F4 C49BA283 C49B6C3C C49B3421 C49AFA2C C49ABE69 C49A80C2 C49A413A
C499FFCD C499BCB3 C4997758 C499303E C498E73D C4989C5E 1B9C0000 1B9C0000 1B9C0000 1B9C0000
1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 03FE0000 03FE0000
03FE0000 03FE0000 03FE0000 03FE0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000
1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 1B9C0000 451869F0 451869F0 451869F0 451869F0
451869F0 451869F0 451869F0 451869F0 451869F0 451869F0 451869F0 451869F0 451869F0 451869F0
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451869F0 451869F0 451869F0 451869F0 451869F0 451869F0
```

Figure A-2. Data Record Dump (Continued)

Table A-1. Values in Header Dump

Variable*	Value	Variable*	Value
ITYPEX	1		
		NTYPEX	2
MJDX	44257		
		IPASSX	1203
ASCX(1)	32.2062		
		ASCX(2)	2.56941
DSCX(1)	20.38553		
		DSCX(2)	-1.870373
MSECX(1)	2788776		
		MSECX(2)	5589965
ALTMX(1)	-6.3170		
		ALTMX(2)	5.6829
ALONX(1)	-106.374		
		ALONX(2)	61.9518
IKP(1)	17		
		IKP(2)	17
GSM(1,1)	99999.0		
		GSM(2,1)	99999.0
GSM(1,2)	99999.0		
		GSM(2,2)	99999.0
GSM(1,3)	99999.0		
		GSM(2,3)	99999.0
DST(1,1)	3.0		
		DST(2,1)	3.0
DST(1,2)	9.0		
		DST(2,2)	8.0
DST(1,3)	-153.9		
		DST(2,3)	-177.9
DST(1,4)	11.0		
		DST(2,4)	12.0

Table A-1. Values in Header Dump (Continued)

Variable*	Value	Variable*	Value
DST(1,5)	-17.4		
		DST(2,5)	-53.2
DST(1,6)	16.3609		
		DST(2,6)	5.6733
COMM(1)	blank		
		COMM(2)	MGS4
COMM(3)	81#2		
		COMM(4-10)	blank
COMM(11)	bbbM		
		COMM(12)	GST(
COMM(13)	4/81		
		COMM(14)	-2)b
COMM(15)	bbNO		
		COMM(16)	bEXT
COMM(17)	blank		
		COMM(18)	FORM
COMM(19)	AT(2		
		COMM(20)	I3,6
COMM(21)	F11.		
		COMM(22)	4)bb
COMM(23)	blank		
		COMM(24)	bb(1
COMM(25)	4,8)		
		COMM(26)	bEPO
COMM(27)	CHb1		
		COMM(28)	980.
COMM(29)	blank		
		COMM(30)	blank
NMAX	14		
		NMAXT	8

Table A-1. Values in Header Dump (Continued)

Variable*	Value	Variable*	Value
MODEXT	0		
		TZERO	1980.0
ABAR	6371.20		
		GH**	
GHT**			
		E(1)	99999.0
E(2)	99999.0		
		E(3)	99999.0

*See Table 2-1 for description of header variables.

**Values of GH appear in Table A-2 and of GHT appear in Table A-3.

Note that the lower case letter b in this table indicates a blank.

Table A-2. Field Model Coefficients (1 of 3)

GH	1	2	3	4	5
1	0.0	5604.70	-2129.49	-334.318	212.159
2	-29987.2	-1956.85	-199.594	271.126	-256.701
3	-1996.16	3027.40	1663.47	-252.227	52.3576
4	1279.84	-2181.01	1251.39	832.994	-297.826
5	937.724	782.490	396.881	-419.449	198.110
6	-217.193	357.826	261.079	-74.3122	-161.997
7	48.4670	65.014	41.8842	-191.964	3.47320
8	72.0547	-59.1687	1.63010	20.9040	-12.1437
9	18.5000	6.71750	-.235900	-10.8967	-7.20940
10	5.36470	10.4460	1.40500	-12.1238	9.48720
11	-3.16550	-3.79850	2.42830	-5.61690	-1.82450
12	2.53060	-1.31790	-1.75120	2.44660	-.194300
13	-1.66480	.025600	-.192600	-.150600	.808400
14	.041100	-.408000	.508400	-.579300	-.134300

Table A-2. Field Model Coefficients (2 of 3)

GH	6	7	8	9	10
1	45.8589	-14.6005	-82.5246	7.23220	-20.9417
2	150.033	93.2305	-27.1809	-17.5606	15.4728
3	-150.605	70.9701	-5.18680	3.76090	8.65560
4	-77.7046	-43.0250	15.9127	-22.2458	-5.06250
5	92.3465	-2.15510	17.9332	9.13500	-6.83460
6	-48.0774	17.2746	-23.0047	16.1418	8.99110
7	13.8394	-107.563	-9.94830	-13.3017	9.67800
8	.433300	10.2831	-1.83570	-14.8067	-5.67245
9	4.39760	2.50150	6.07890	-.822800	2.18540
10	-3.56810	-1.02950	6.88080	1.41490	-5.04740
11	4.49320	3.31830	.662000	2.27440	3.07440
12	-.879300	-.362000	1.36450	1.50040	-.627700
13	.540100	-.481600	-.213000	.315900	-.597300
14	.852300	-.514500	.158700	-.870500	.173900

Table A-2. Field Model Coefficients (3 of 3)

GH	11	12	13	14
1	1.24100	.851600	.403100	-.463500
2	.351700	1.95180	.617900	.258900
3	2.89650	-1.54510	2.28220	1.21000
4	5.81080	-3.22020	-1.39000	-.207500
5	-4.25330	.487400	.384900	-.505300
6	-.143300	-.311200	.148500	-.088300
7	-1.31520	-2.35640	-.257300	.859600
8	3.12070	-.257100	.119700	.260000
9	-.222000	-1.47900	-.005300	.978700
10	-6.41010	-1.88080	-1.34140	.208000
11	-.512700	1.10330	.502200	-.118900
12	1.89950	3.51500	.925600	-.360300
13	-.168100	.813200	-.009100	-.920200
14	-.087100	.325300	-.489500	.445700

*All elements of rows and columns 15 through 17 are zero

Table A-3. Time Derivatives of Field Model Coefficients

GHT	1	2	3	4
1	0.0	-22.4291	-12.8701	3.94760
2	25.5006	12.7797	-20.7837	1.25120
3	-10.9121	.499700	11.0924	-9.36320
4	-5.55910	-6.57580	-2.86560	-.457400
5	-.866600	1.79740	-6.72190	.749800
6	.550600	-1.83110	-.232600	-3.30720
7	1.53910	2.21720	.554900	.558900
8	1.07950	-2.45210	.149800	.648800

GHT	5	6	7	8
1	-.407700	1.11790	-1.53580	-1.27900
2	-1.72780	1.50230	-2.70610	.941600
3	5.71370	-1.93040	-.741300	.990300
4	-4.05040	3.55560	-1.15100	-.245400
5	-7.17570	.625000	.614600	-.505600
6	1.54110	-2.58480	3.84160	-.684500
7	.897800	-.294800	-1.33820	1.79870
8	-.691100	-1.66200	1.39960	1.46430

*All elements of rows and columns 9 through 14 are zero.

Table A-4. Values in Data Record

Variable*	Value	Variable	Value
ITYPEB	2	NTYPEB	2
MJDB	44257	MSECB	1380462
IPASSB	1203	TINTB	4915.4453
DATA	See Table A-5		

*See Table 2-2 for description of data record variables.

Table A-5. Values in Data Array of Data Record (1 of 8)

Variable*/Number	LAT	LONG	RAD	MLT	INVLAT	DIPLAT
1	-83.2059	-11.8851	6778.88	20.8814	69.3917	-54.5624
2	-83.1909	-14.5943	6779.31	20.8230	69.2218	-54.5045
3	-83.1611	-17.2849	6779.74	20.7661	69.0492	-54.4440
4	-83.1167	-19.9471	6780.17	20.7105	68.8740	-54.3809
5	-83.0581	-22.5694	6780.60	20.6563	68.6961	-54.3151
6	-82.9855	-25.1435	6781.03	20.6034	68.5157	-54.2466
7	-82.8994	-27.6599	6781.46	20.5518	68.3329	-54.1754
8	-82.8004	-30.1126	6781.90	20.5016	68.1477	-54.1015
9	-82.6889	-32.4949	6782.33	20.4525	67.9603	-54.0248
10	-82.5655	-34.8026	6782.77	20.4047	67.7705	-53.9454
11	-82.4308	-37.0328	6783.20	20.3581	67.5785	-53.8632
12	-82.2854	-39.1826	6783.64	20.3126	67.3844	-53.7782
13	-82.1299	-41.2515	6784.08	20.2682	67.1882	-53.6903
14	-81.9648	-43.2385	6784.52	20.2247	66.9901	-53.5996
15	-81.7908	-45.1449	6784.95	20.1822	66.7900	-53.5061
16	-81.6085	-46.9711	6785.39	20.1407	66.5880	-53.4097
17	-81.4182	-48.7196	6785.83	20.1001	66.3842	-53.3105
18	-81.2207	-50.3918	6786.27	20.0605	66.1786	-53.2086
19	-81.0163	-51.9908	6786.71	20.0219	65.9713	-53.1038
20	-80.8056	-53.5185	6787.15	19.9841	65.7623	-52.9963

Table A-5. Values in Data Array of Data Record (2 of 8)

Variable*/Number	LAT	LONG	RAD	MLT	INVLAT	DIPLAT
21	-80.5888	-54.9784	6787.60	19.9473	65.5516	-52.8859
22	-80.3666	-56.3729	6788.04	19.9112	65.3394	-52.7728
23	-80.1392	-57.7053	6788.48	19.8760	65.1257	-52.6571
24	-79.9070	-58.9782	6788.93	19.8417	64.9104	-52.5386
25	-79.6703	-60.1946	6789.37	19.8080	64.6938	-52.4174
26	-79.5294	-61.3577	6789.81	19.7751	64.4757	-52.2937
27	-79.1846	-62.4696	6790.26	19.7429	64.2564	-52.1673
28	-78.9362	-63.5335	6790.70	19.7115	64.0357	-52.0383
29	-78.6844	-64.5516	6791.15	19.6807	63.8138	-51.9069
30	-78.4974	-65.5265	6791.60	19.6505	63.5906	-51.7729

*See Table 2-3 for description of variables in data array.

Table A-5. Values in Data Array of Data Record (3 of 8)

Variable*/Number	BS	BV	X	Y	Z	BVA
1	99999.0	43007.5	14055.3	-3595.17	-40486.7	43007.2
2	99999.0	42988.5	14263.1	-3014.62	-40441.1	42987.9
3	42968.0	42967.8	14368.4	-2491.45	-40417.5	42967.3
4	99999.0	42946.6	14444.7	-1977.81	-40396.1	42946.0
5	42925.5	42923.7	14490.5	-1466.89	-40377.2	42923.7
6	99999.0	42900.0	14533.7	-957.405	-40351.8	42900.3
7	99999.0	42876.2	14579.9	-460.395	-40318.5	42875.8
8	99999.0	42851.2	14571.3	-18.8001	-40297.7	42850.8
9	99999.0	42824.6	14558.6	400.138	-40272.0	42824.6
10	42798.7	42798.3	14547.7	842.662	-40241.1	42797.6
11	42770.2	42769.4	14545.0	1303.13	-40199.0	42769.0
12	99999.0	42740.8	14526.5	1741.84	-40158.7	42740.2
13	99999.0	42709.6	14505.0	2105.15	-40115.8	42710.0
14	99999.0	42678.9	14497.3	2559.17	-40059.5	42678.6
15	99999.0	42645.6	14469.5	2941.62	-40007.9	42646.0
16	99999.0	42611.7	14434.9	3324.30	-39954.2	42611.8
17	42577.8	42577.2	14386.6	3650.64	-39906.3	42576.7
18	9999910	42540.6	14341.7	3968.19	-39853.1	42540.3
19	42503.9	42502.6	14295.1	4259.20	-39799.3	42502.3
20	99999.0	42462.9	14249.7	4540.23	-39742.1	42462.7

Table A-5. Values in Data Array of Data Record (4 of 8)

Variable*/Number	BS	BV	X	Y	Z	BVA
21	99999.0	99999.0	99999.0	99999.0	99999.0	42422.5
22	99999.0	42380.3	14164.8	5039.35	-39623.9	42380.5
23	99999.0	42336.7	14120.1	5265.47	-39563.8	42336.9
24	42293.4	42292.7	14079.1	5476.95	-39502.6	42292.1
25	42246.9	42246.6	14045.2	5679.57	-39436.6	42246.4
26	99999.0	42199.2	14013.2	5867.54	-39369.7	42198.0
27	99999.0	42149.6	13981.9	6041.76	-39301.3	42150.0
28	99999.0	42099.8	13956.6	6207.57	-39231.1	42099.6
29	99999.0	42048.4	13934.5	6363.98	-39158.6	42048.2
30	99999.0	41995.1	13914.9	6506.54	-39084.9	41995.9

*See Table 2-3 for explanation of variables in data array.

Table A-5. Values in Data Array of Data Record (5 of 8)

Variable*/Number	XA	YA	ZA	BVSD	XSD	YSD
1	14067.6	-3586.88	-40482.3	-6.03545	75.4094	80.9990
2	14259.0	-3018.13	-40441.4	-6.03762	72.3096	64.9990
3	14367.0	-2490.33	-40417.3	-6.03943	36.1777	22.9990
4	14442.2	-1981.05	-40396.0	-7.04138	31.1219	9.99900
5	14492.5	-1470.85	-40376.1	-6.04483	81.0948	60.9990
6	14536.7	-964.816	-40350.6	-6.04673	51.0673	43.9990
7	14576.4	-465.514	-40319.1	-6.04803	31.0730	35.9990
8	14573.9	-20.2290	-40296.1	-6.04936	-26.0207	28.8880
9	14564.5	415.978	-40269.4	-6.05177	-50.0024	131.934
10	14550.6	849.262	-40239.1	-5.05376	-31.0425	83.7945
11	14545.7	1308.42	-40198.2	-7.05471	-20.0161	51.9706
12	14526.6	1737.52	-40158.1	-6.05826	-27.0353	48.8244
13	14510.3	2112.90	-40113.8	-6.06180	-28.0600	71.7908
14	14494.5	2543.43	-40061.1	-6.06299	-19.0373	62.8626
15	14471.7	2941.21	-40007.3	-6.06562	-30.0777	120.703
16	14433.1	3318.83	-39955.5	-7.06706	-14.0829	40.7200
17	14386.1	3649.16	-39906.0	-6.06991	-10.0952	10.6722
18	14342.2	3965.63	-39852.8	-6.0772	-7.09140	19.6113
19	14295.6	4257.74	-39798.7	-6.07641	-3.09453	6.58688
20	14249.8	4540.18	-39741.8	-6.07970	-4.09289	17.5456

Table A-5. Values in Data Array of Data Record (6 of 8)

Variable*/Number	XA	YA	ZA	BVSD	XSD	YSD
21	14205.3	4795.20	-39684.7	-6.08207	-5.09033	13.5082
22	14161.9	5036.04	-39625.4	-6.08382	-20.0785	16.4797
23	14119.4	5263.80	-39564.4	-7.08650	-18.0765	9.44631
24	14080.3	5475.95	-39501.7	-7.08893	-12.0807	8.41585
25	14044.9	5675.92	-39437.1	-7.09184	-4.06923	15.3998
26	14012.5	5868.19	-39368.5	-7.09328	-4.06241	11.3681
27	13982.7	6041.61	-39301.5	-6.09832	-4.05702	11.3532
28	13956.7	6206.98	-39230.9	-6.10053	-3.04927	3.32354
29	13934.5	6362.75	-39158.5	-6.10340	-4.04200	8.30704
30	13915.7	6503.64	-39085.9	-6.10606	-5.03392	7.27476

*See Table 2-3 for explanation of variables in the data array.

Table A-5. Values in Data Array of Data Record (7 of 8)

Variable*/Number	ZSD	BMD	XMD	YMD	ZMD	QUAL**
1	23.0782	42994.0	13937.3	-3677.89	-40505.7	7068
2	23.0681	42976.1	14090.5	-3135.28	-40479.1	7068
3	13.0427	42957.1	14222.8	-2594.66	-40451.1	7068
4	11.0368	42937.1	14334.1	-2055.80	-40421.7	7068
5	31.0451	42916.1	14424.3	-1518.96	-40390.8	7068
6	22.0503	42894.0	14494.1	-991.501	-40358.4	7068
7	10.0665	42870.7	14546.6	-478.118	-40324.5	7068
8	13.0446	42846.4	14581.9	21.4028	-40289.0	7068
9	22.0647	42820.9	14599.8	506.857	-40252.0	7068
10	15.0594	42794.2	14603.5	974.055	-40213.3	7068
11	11.0859	42766.3	14597.0	1421.51	-40172.9	7068
12	10.0859	42737.2	14580.4	1849.12	-40130.9	7068
13	17.0859	42706.9	14553.7	2257.06	-40087.1	1022
14	10.1088	42675.3	14519.9	2644.13	-40041.8	1022
15	17.0923	42642.5	14482.5	3011.23	-39994.6	1022
16	8.10334	42608.4	14441.5	3358.35	-39945.7	1022
17	7.10221	42572.9	14396.8	3685.61	-39895.6	1022
18	7.10627	42536.2	14350.5	3993.49	-39842.5	1022
19	7.11000	42498.1	14304.8	4284.13	-39788.2	7068
20	6.11439	42458.7	14259.7	4557.52	-39732.1	7068

Table A-5. Values in Data Array of Data Record (8 of 8)

Variable*/Number	ZSD	BMD	XMD	YMD	ZMD	QUAL**
21	7.11675	42417.9	14215.2	4813.79	-39674.2	7068
22	10.1224	42375.7	14172.2	5053.79	-39614.4	7068
23	10.1253	42332.2	14132.0	5279.99	-39552.8	7068
24	9.12495	42287.3	14094.5	5492.40	-39489.2	7068
25	6.13219	42240.9	14059.7	5691.07	-39423.8	7068
26	6.13411	42193.2	14028.0	5876.89	-39356.5	7068
27	5.14035	42144.0	13999.8	6051.97	-39287.3	7068
28	6.14240	42093.4	13975.0	6216.47	-39216.2	7068
29	6.14640	42041.4	13953.7	6370.34	-39143.2	7068
30	6.14844	41987.9	13936.0	6514.23	-39068.4	7068

*See Table 2-3 for explanation of variables in data array.

**All values appear in the left two bytes of the appropriate word. The right two bytes are zero-filled. In the actual tapes sent to the investigators, QUAL is in the left two bytes and the right two bytes are zero-filled. The spare variable (byte locations 2904-3024) is filled with 99999.0.

REFERENCES

1. MAGSAT Spacecraft Description, M. M. Schaefer, F. F. Mobley, D. L. Margolies, Applied Physics Laboratory, Johns Hopkins University, SDO 5146, September 1978.

2. MAGSAT Data Processing: A Peport for Investigators, R. Langel, J. Berbert, T. Jennings, and R. Horner, GSFC TM82160, November 1981.

3. "Three-Axis Attitude Determination from Vector Observations," M. D. Shuster and S. D. Oh, Journal of Guidance and Control, Volume 4, Number 1, January-February 1981, p. 70.

VBS
PHYSICAL CW

D46266
(79-094A-01G,02J)
3/26/80 - 5/19/80

LOGICAL WORD

RECORD 1 OF FILE 1
LENGTH = 30000 BYTES

MO..DAY..YR

75300000	08B80000	00000001	00000002	0000AD24	000008D3	4249469A	421023F3	422E7191	41A34C9F
0009F25A	00347F6A	C167C0D2	41583EBA	C263FC18	424464F4	0000001E	0000001E	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	C2170000	C2170000	41200000	41200000	4226B333	4226B333
42150000	42150000	427AE666	427AE666	C22CA321	C2293979	40404040	D4C7E2F4	F8F17BF2	40404040
40404040	40404040	40404040	40404040	40404040	40404040	404040D4	C7E2E34D	F461F8F1	60F25D40
4040D5D6	40C5E7E3	40404040	C6D6D9D4	C1E34DF2	C9F36BF6	C6F1F14B	F45D4040	40404040	40404DF1
F46BF85D	40C5D7D6	C3C840F1	F9F8F04B	40404040	40404040	0000000E	00000008	00000000	437BC000
4418E333	00000000	C4752333	C37CC28F	434FFD71	433A9B96	C2D93168	4230778D	42480BB3	42127FF3
4155D5D0	C132A5E3	41287D56	C11AA71E	3FA85879	00000000	00000000	00000000	4415E4B3	C37A4D9A
43BD3666	C3885029	4330E7D7	43165D37	42410396	C23B2B30	416B7AE1	41A722D1	C13CC6A8	C115161E
3F68DB8C	C06872B0	00000000	00000000	00000000	C38517D7	C2C79810	4367F785	434E363D	4318CE19
43105144	4229E25B	411A14E4	C03C63F1	41167AE1	4126DA51	C11C04EA	C0314E3C	40822681	00000000
00000000	00000000	C314E517	4310F204	C2FC3A1D	43340FE7	C31A372F	C24A4FEC	C2BFF6C9	4214E76D
C1AE58E2	C1C1FB16	C159DED3	41272546	C0268DB9	C0944D01	00000000	00000000	00000000	42D428B4
C3100B37	42345B8C	C3129D37	42C61C29	C2A1FF3B	4137923A	C1C24C98	C17359B4	4197CB92	C11D3127
4031BDA5	40CEF34D	C022617C	00000000	00000000	00000000	422DDBE1	42960873	C2969AE1	C24DB461
425C58B4	C23013F1	41DD6E2F	406EECC0	41465C92	C13916F0	4147E426	C0E119CE	408A43FE	40DA3055
00000000	00000000	00000000	C1E99BA6	425D3B02	4246F858	C22B0666	C1227B4A	4211464C	C26B9021
41A48794	41280625	C11078D5	413517C2	C05CAC08	C07B4A23	C083B646	00000000	00000000	00000000
C252864C	C21B2E4F	C152FD22	41FE9A6B	4211EEE6	C2170134	C19F2C3D	C11D5F07	4161432D	416E17C2
40A978D5	4115E979	C036872B	4028A090	00000000	00000000	00000000	4173B717	C2118F83	413C2CA5
C2163EED	419228F6	4210244D	C1D4D3C3	C1ECE83E	C0D2A305	4116A36E	412463F1	411801A3	4050DED3
C0DED917	00000000	00000000	00000000	C214F113	41F79097	418A7D56	C1510000	C16D5A86	418FDB8C
419AD912	C15AC28F	4122F766	C150C227	413130BE	C0A0B0F2	C098E8A7	402C84B6	00000000	00000000
00000000	4113DB23	405A0903	412E5810	415CF909	C1440D84	C024AF4F	C1150B0F	4131EE63	C038D4FE
C1668FC5	C083404F	411E645A	C02B089A	C0164C30	00000000	00000000	00000000	40DA0275	411F3A93
C118B8BB	C13385F0	407CC63F	C04FAACE	C125B3D0	C041D14E	C117A9FC	C11E17C2	4111A71E	41383D71
40D02DE0	405346DC	00000000	00000000	00000000	40673190	409E2EB2	412483E4	C1163D71	406288CE
40260419	C041DE6A	401EA4A9	BF15B574	C1157660	4080902E	40ECF41F	BF25460B	C07D4FDF	00000000
00000000	00000000	C076A7F0	40424745	41135C29	C0351EB8	C0815B57	C0169AD4	40DC0EBF	40428F5C
40FA8C15	40353F7D	C01E703B	C05C3C9F	C0EB923A	40721965	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	42198027	C1AE97F6	C158F213	C0DDD97F	408CF41F	4118A027	411145A2	00000000	00000000
00000000	00000000	00000000	00000000	C2166DD9	41CC79A7	407FEC57	C169367A	411CC227	C11D4C30
412379A7	C1273BCD	00000000	00000000	00000000	00000000	00000000	00000000	C1CDEBEE	C214C8A1
41B17A78	C12DD97F	C16B8CE7	C03B8BAC	408E0DED	4026594B	00000000	00000000	00000000	00000000
00000000	00000000	413F295F	411404EA	C195CFAB	C075182B	40BFF2E5	C134EA4B	408F1412	40A617C2
00000000	00000000	00000000	00000000	00000000	00000000	C0685F07	C11BA512	415B6B51	C140CE70
C172CFAB	4118A858	40E5D639	C0B0EBEE	00000000	00000000	00000000	00000000	00000000	00000000
4111E2EB	4118096C	C11EE2EB	4138E3BD	40A00000	C1295B57	404B7803	C11A978D	00000000	00000000
00000000	00000000	00000000	00000000	C11892A3	C12B4C30	C0BDC5D6	41126A7F	409D566D	413D7732
C1156944	411664C3	00000000	00000000	00000000	00000000	00000000	00000000	C11476C9	40F10CB3
40FD844D	C03ED289	C0816F00	C0AF3B64	411CC77A	41176DC6	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000

5

VBS physical CW, logical word = 0674 (HEX) = 1652 (DEC) ÷ 40 bytes per line = 41
count down 41 lines to find stop time

D462266 (79-094A-01F,02J)

RECORD 2401 OF FILE 1
LENGTH = 19824 BYTES

4D700000	06740200	44AB9273	44AAEFD3	44AA4C20	44A9A71B	44A906A6	44A85D5D	44A7B5B0	44A7116E
44A66803	44A5BF60	44A51BCF	44A474B6	44A3CEED	44A325A0	44A27E27	44A1D762	44A12FCF	44A09436
449FE280	449F3CFC	449E9707	449DF1BF	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
4444CCB4	444523E2	4445A076	44461CCF	4446946A	44470960	444777FC	4447E9A5	44485807	4448C207
44492FC0	44499E22	444A02B2	444A688A	444ACB73	444B2EC6	444B8E03	444BEC0E	444C496B	444C9B6B
444CF7BE	444D4EDA	444DA5AB	444DF948	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
43FC9E8C	43FC5873	43FBFD85	43FB9F3A	43FB4CC7	43FAFC48	43FAAD51	43FA57E6	43FA024B	43F9B55F
43F941BC	43F8B4B2	43F87607	43F834D0	43F7FBB2	43F7BEC2	43F78D1F	43F73EEA	43F6D1BD	43F6B498
43F6A5F5	43F6823C	43F654BA	43F5FCAB	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
449D8D08	449CED12	449C0419	449B19C8	449A2F4E	4499438A	44985EB2	44976D7E	44967EBF	449594A8
4494A23C	4493AF80	4492C5C0	4491D649	4490E8AE	448FF5F4	448F064A	448E1700	448D2681	448C4853
448B4A07	448A5B83	44896BD7	44887DF8	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
C1652695	C1652D5D	C175368F	C1654011	C1554D29	C155545E	C1655B05	C1655C3A	C1755FEF	C15561D9
C155631B	C15561A4	C1656132	C1656685	C16567FC	C1556E6E	C1556B89	C16567D4	C165626D	C1356EFA
C156554A	C1556279	C1455CE9	C165603D	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
41A40356	41840F66	41A4091F	4153EBBE	4133D7FE	4133BF77	4133A9E4	413397F4	41338AF4	413375E3
42113B48	41736120	417350F2	41633FC5	41833BAB	41632450	41330EE2	421233D4	42232C7D	42142BF2
4182F21A	41C2C2DE	4182CB04	4142B8F7	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
C1702C42	C150294F	C1502EC9	C1402D46	C13029BC	C13027FF	C13028C8	C1302BC0	C1302BA6	C1302650
C2130751	C14024FA	C13024AB	C1401F21	C1401FE7	C1401AD6	C1301869	C2180616	C21C0127	C1D0197B
42120148	C19019A8	C18020FC	C14024C5	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
C1576B15	C1777822	C17786E1	C1678C71	C1579992	C147A3A7	C157AC24	C167A5D3	C167B12A	C167AD68
C197CC40	C177B623	C167B9D7	C157BDE5	C177C291	C167CB40	C147C770	C1A7D5F2	C2127A35	C1B7B7BA
C167D838	C197B5AC	C157C1F2	C177C3C6	44B07907	44AFDE14	44AF420C	44AEA519	44AE072B	44AD6850
44ACC89B	44AC2814	44AB86CD	44AAE4B8	44AA420E	44A99EC7	44A8FAF3	44A85684	44A7B1B1	44A70C74
44A666DF	44A5C0E1	44A51AB4	44A47458	44A3CDC5	44A3270D	44A28032	44A1D963	44A13290	44A08BC9
449FE508	449F3E80	449E9821	449DF1FC	4441AB2B	444234CE	4442BC5C	444341D1	4443C539	44444686
4444C5C0	444542F2	4445BE0D	44463721	4446AE30	44472346	44479658	44480773	4448769D	4448E3E4
44494F3D	4449B8B4	444A2058	444A8630	444AEA43	444B4C84	444BAD0D	444C0BE9	444C6922	444CC4AE
444D1EA1	444D770A	444DCDF3	444E2354	43FC72E7	43FC39CC	43FBFE0B	43FBC010	43FB7FD5	43FB3D5D
43FAF930	43FAB3A5	43FA6CC4	43FA248D	43F9DB9D	43F99227	43F94831	43F8FDBC	43F8B36D	43F86966
43F81FB1	43F7D649	43F78DE8	43F746A8	43F70087	43F6BB8B	43F67823	43F63696	43F5F6DD	43F5B8FF
43F57D6A	43F54460	43F50DD6	43F4D9D4	44A309B1	44A22A55	44A1499A	44A067B0	449F847F	449EA01F
449DBAA7	449CD420	449BECA1	449B0416	449A1AC3	4499309B	449845B7	44975A01	44966DB9	449580D5
44949370	4493A570	4492B713	4491C85B	4490D93B	448FE9CD	448EFA0C	448E0A2B	448D1A13	448C29DB
448B3976	448A4919	448958AD	4488684A	0000270F	0000270F	00001BA6	00001BA6	00001BA5	00001BA5
00001794	000007F4	000007F4	00001B9C	00001B9C	00001B9C	00001B9C	00001B9C	00001B9C	00001B9C
00001B9C	000003FE	000003FE	000003FE	000003FE	000003FE	00001B9C	00001B9C	000007F4	000007F4
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451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	0BD40000	00000002	00000002	0000AD5A	03BCCA87	00000C1F
44133372	422DEDAE	422D9AB4	422D47B3	422CF4B4	422CA1B1	422C4EA8	422BFBA2	422BA894	422B5589
422B0276	422AAF67	422A5C52	422A093E	4229B625	4229630E	42290FF0	4228BCD6	422869B7	42281698
4227C379	42277055	42271D31	4226CA0F	422676E5	422623C0	4225D09A	42257D6E	42252A45	4224D717
422483EC	C2AC1EE6	C2AC388E	C2AC51FA	C2AC6B2A	C2AC8421	C2AC9CE0	C2ACB567	C2ACCDBA	C2ACE5D7
C2ACFDC1	C2AD1578	C2AD2CFE	C2AD4453	C2AD5B7B	C2AD7273	C2AD893D	C2AD9FDD	C2ADB650	C2ADCC98
C2ADE2B7	C2ADF8AD	C2AE0E7A	C2AE2421	C2AE39A3	C2AE4EFD	C2AE6433	C2AE7946	C2AE8E35	C2AEA303
C2AEB7AE	4419F794	4419F7BC	4419F7E6	4419F810	4419F839	4419F864	4419F88F	4419F8BA	4419F8E5
4419F910	4419F93C	4419F969	4419F995	4419F9C2	4419F9EF	4419FA1D	4419FA4A	4419FA79	4419FAA7
4419FAD6	4419FB05	4419FB34	4419FB64	4419FB93	4419FBC4	4419FBF4	4419FC25	4419FC56	4419FC87
4419FCB8	41551370	41551FF0	41552C50	41553890	415544C0	415550C0	41555CA0	41556870	41557420

D-43683
Investigator B Tape
11/2/79 - 1/19/80
79-094A-01G, 02J

RECORD 1 OF FILE 1
LENGTH = 30000 BYTES

AC93

75300000	08E80000	00000001	00000002	0000[redacted]	00000001	451869F0	451869F0	421E4795	413AF422
003E882C	0068F394	C1609A9F	415F6430	C268B22E	423CC557	00000021	00000021	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	C2200000	C2200000	421C0000	421C0000	42284CCD	42284CCD
42150000	42150000	424F8000	424F8000	C2492295	C2200011	40404040	D4C7E2F4	F8F17EF2	40404040
40404040	40404040	40404040	40404040	40404040	40404040	404040D4	C7E2E34D	F461F8F1	60F25D40
4040D5D6	40C5E7E3	40404040	C6D6D9D4	C1E34DF2	C9F36BF6	C6F1F14B	F45D4040	40404040	404040F1
F46BF85D	40C5D7D6	C3C840F1	F9F8F04B	40404040	40404040	0000000E	00000008	00000000	4378C000
4418E333	00000000	C4752333	C37CC2EF	434FFD71	433A9896	C2D93168	4230778D	42480EE3	42127FF3
4155D5D0	C132A5E3	41287D56	C11AA71E	3FAE5879	00000000	00000000	00000000	4415E4E3	C37A4D9A
438D3666	C3885029	4330E7D7	43166D37	42410396	C23B2830	41687AE1	41A722D1	C13CC6A8	C115161E
3F68DB8C	C06872B0	00000000	00000000	00000000	C38517D7	C2C79810	4367F785	434E363D	4318CE19
43105144	4229E25B	411A14E4	C03C63F1	41167AE1	4126CA51	C11C04EA	C0314E3C	40822681	00000000
00000000	00000000	C314E517	4310F204	C2FC3A1D	43340FE7	C21A372F	C24A4FEC	C2EFF6C9	4214E76D
C1AE58E2	C1C1FB16	C159DED3	41272546	C0268DE9	C0944D01	00000000	00000000	00000000	42C428B4
C3100837	42345E8C	C3129D37	42C61C29	C2A1FF3B	4137923A	C1C24C98	C1735984	4197CE92	C11D3127
4031BDA5	40CEF34D	C022617C	00000000	00000000	00000000	422DDBE1	42960873	C2969AE1	C24DB461
425C5884	C23013F1	41DD6E2F	406EECC0	41465C92	C13916F0	4147E426	C0E119CE	408A43FE	40CA3055
00000000	00000000	00000000	C1E99BA6	425D3B02	4246F558	C2280666	C1227B4A	4211464C	C2680021
41A48794	41280625	C11078D5	413517C2	C05CAC08	C07B4A23	C0838646	00000000	00000000	00000000
C252864C	C2182E4F	C152FD22	41FE9A6B	4211EEE6	C2170134	C19F2C3D	C11D5F07	4161432D	416E17C2
40A978D5	4115E979	C036872B	4028A090	00000000	00000000	00000000	4173B717	C2118F83	413C2CA5
C2163EED	419228F6	4210244D	C1D4D3C3	C1ECE83E	C0D2A305	4116A36E	412463F1	411801A3	4050DED3
C0DED917	00000000	00000000	00000000	C214F113	41F79C97	418A7D56	C1510000	C16D5A86	418FD88C
419AD917	C15AC28F	4122F766	C150C227	4131308E	C0A080F2	C098E8A7	402C84B6	00000000	00000000
00000000	4113C823	405A0903	412E5810	415CF989	C1440D84	C024AF4F	C1150B0F	4131EE63	C038D4FE
C1668FC5	C083404F	411E645A	C02B085A	C0164C30	00000000	00000000	00000000	40DA0275	411F3A93
C1188 8BB	C13385F0	407CC63F	C04FAACE	C125B3D0	C041C14E	C117A9FC	C11E17C2	4111A71E	41383D71
40D02DE0	405346DC	00000000	00000000	00000000	40673190	409E2EB2	412483E4	C1163D71	406288CE
40260419	C041CE6A	401EA4A9	BF158574	C1157660	4080902E	40ECF41F	BF25460E	C07D4F0F	00000000
00000000	00000000	C076A7F0	40424745	41135C29	C0351EE8	C0815B57	C0169AD4	40DC0EEF	40428F5C
40FA8C15	40353F7D	C01E703B	C05C3C9F	C0E8923A	40721965	00000000	00000000	00000000	00000000
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00000000	42198027	C1AE97F6	C158F213	C0DDD97F	402CF41F	4118A027	411145A2	00000000	00000000
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412379A7	C1273ECD	00000000	00000000	00000000	00000000	00000000	00000000	C1CDEEEE	C214C8A1
41B17A78	C12DD97F	C16E8CE7	C03B8BAC	408E0DED	4026554B	00000000	00000000	00000000	00000000
00000000	00000000	413F295F	411404EA	C155CFAB	C075182B	40BFF2E5	C134EA4B	408F1412	40A617C2
00000000	00000000	00000000	00000000	00000000	00000000	C0685F07	C11BA512	41586E51	C140CE70
C172CFAB	4118A858	40E5D639	C0B0EBEE	00000000	00000000	00000000	00000000	00000000	00000000
4111E2EB	4118096C	C11EE2EB	4138E3BD	40A00000	C1295B57	404B7803	C11A978D	00000000	00000000
00000000	00000000	00000000	00000000	C11892A3	C12B4C30	C0EDC5D6	4112CA7F	409D566D	413D7732
C1156944	411664C3	00000000	00000000	00000000	00000000	00000000	00000000	C11476C9	40F10CB3
40FD944D	C03EC289	C0816F00	C0AF3B64	411CC77A	41176DC6	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	451869F0	451869F0	451869F0	0ED40000
00000002	00000002	0000AC93	003BACE7	00000001	44133372	C1C7AB4A	C1C2CA46	C1BDE8D8	C189077E
C1B425E3	C1AF43EF	C1AA6217	C1A57EC6	C1A09D88	C19BBADA	C196D842	C191F539	C18D1246	451869F0
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451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	C2695A18	C2696919	C2697812	C2698707
C26955F8	C269A4E2	C269B3C8	C269C2AA	C269D186	C269E05F	C269EF34	C269FE04	C26A0CD0	451869F0
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451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	441B070A	441B069F	441B0634	441B05C8
441B055B	441B04EE	441B0480	441B0412	441B03A3	441B0333	441B02C2	441B0251	441B01CF	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	4211E8A4	4211E769	4211E62E	4211E4F3
4211E3B9	4211E27E	4211E142	4211E007	4211DECC	4211DC90	4211DC55	4211DB19	4211D9DD	451869F0
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42114696	421132FB	42112073	42110F03	4210FEE1	4210EF81	4210E179	4210D4B7	4210C928	451869F0
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451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	C153788A	C14EDBDA	C14A3082	C1459E02

418D3592	41CD92F6	41EBE438	4211EC6B	4210F217	4212608D	4213EC02	4217E631	4217E21D	421A4661
421C8BE6	421E632D	4221397E	42245 2BF	4227D037	42287230	422EE08F	4232609E	4236C459	4233D3E7
4240AADC	42458E7E	424C0D3D	424CCF21	425ACFE8	42591FD8	426C3F4A	426E5E02	427B4082	40F712F0
40E3729C	40929 97C	40A869AA	4111E3AA	405C622C	40A6CA7A	407B46C9	40A3AE91	409E2EE9	405F203A
40A52E2A	40E98F9B	40C83283	40EA6AE6	40EA64B6	41136786	41142B59	411E09ED	411A58C1	412D1D86
4122E038	40FECB28	4114A931	4116BC9A	4118345 3	411CAE8A	41297D77	4150B82F	417B090F	4148A55A
44A8A7B2	44 A8A9EC	44A8ABF5	44A8ADCE	44A8AF77	44A8B0F7	44A8B232	44AEE325	44 A8B3C2	44A8B43B
44A8B44D	44 A8E405	44A8B363	44A8B273	44AEB118	44A8AF4D	44A8AD12	44AEAA60	44 A8A728	44A8A375
44A89F3E	44 A89A84	44A89526	44A88F1F	44AE6E6F	44A88128	44A87934	44A87084	44 A86719	441A8CF5
441AD295	441B1D8D	441B6EF9	441BC652	441C23C4	441C67DC	441CF34F	441D6626	441DE054	441E626F
441EED32	441F80AD	44201CD0	4420C218	4421710A	44222 9AE	4422EBF2	4423B82C	44248DFF	44256D65
44265647	442748AB	44284284	4429435 1	442A4B2C	442B5580	442C69AA	442D7AA1	442E8C75	C43071AF
C4304940	C4301D87	C42FEDE3	C42FBA4F	C42F82CB	C42F46D6	C42F0554	C42E8E41	C42E71A2	C42E1EC0
C42DC402	C42D6152	C42CF6BA	C42C6350	C42C04EF	C42B7ADA	C42AE5B0	C42A4426	C4299328	C428D26D
C4280208	C42720D7	C4262B54	C4252 15E	C42402DB	C422CEDD	C421831E	C4201FD3	C41EA4E9	C49F5763
C49F5A7E	C49F5D60	C49F5FF5	C49FC23D	C49F6437	C49F65E3	C49F6726	C49F67FD	C49F686A	C49F686A
C49F67E5	C49F66D8	C49F6543	C49F6331	C49F607D	C49F5D22	C49F5920	C49F5470	C49F4EFF	C49F48CD
C49E41D9	C49E3A21	C49E317D	C49E27EA	C49E1D66	C49E1201	C49E059D	C49EEF82C	C49EE9AF	00001B9C
00001B9C	000003FE	000003FE	000003FE	000003FE	000003FE	00001B9C	00001B9C	00001E9C	00001B9C
00001B9C	00001B9C	00001B9C	00001B9C	00001B9C	00001B9C	00001B9C	00001B9C	00001E9C	00001B9C
000003FE	000003FE	000003FE	00000 3FE	000003FE	00001B9C	00001B9C	00001B9C	00001E9C	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
00000002	00000001	0000[redacted]	00147C95	000004E2	44133372	C252D54D	C252EDA7	C2530 29E	C2531416
C25321F1	C2532C1C	C2533286	C2533525	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	41859CD6	415DF6DE	41355699	40ED6B23
C11E60B2	C1492676	C1745A38	C19FC010	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	441A7798	441A7805	441A7871	441A78DE
441A794E	441A79B9	441A7A26	441A7A93	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	421560A4	42154ECD	42153D5F	42152C58
42151BB9	42150E80	4214FBAB	4214EC3A	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
4245FEFB	4245D62F	4245AC9E	42458250	451869F0	45186 9F0	4246CA34	4246 74A0	42464E39	42462 6FF
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	C236EC7C	C236E27F	C236D7EC	C236CCC2
C236C0FD	C236E49A	C236A795	C23699EE	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	44A86E93	451869F0	451869F0	451869F0
451869F0	451869F0	44A81EE8	44A80CE1	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	44A86DDA	44AE63FA	44 A857E8	44A84AD4
44A83D35	44 A81DF1	44A81DBF	44A80CB6	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	442F285B	44301922	4431436D	443274D0
4433BB6E	4434C1DB	4435BCAB	44368 37A	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451969F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	C41D2398	C4185 03A	C41991FC	C417B218
C415C6E7	C413E2C2	C41176CA	C3F71609	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	C49F0B9F	C49F0C02	C49EEDE9	C49ECAD1
C49E9996	C49E7885	C49E5638	C49E33D3	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	44A86DCC	44AE633B	44 A8578A	44A84A56
44A83D25	44 A82E10	44A81D8B	44A80C03	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	442F2763	443016C3	44313D56	44329297
4433B612	4434EF54	4435BD03	443678E5	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	C41D3433	C41863AC	C4198D62	C4178FDC
C415C8F3	C413E59C	C4117443	C3F733F5	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	C4 5F0890	C49F0855	C49EEFF8	C49EC5A9
C49E9AA8	C49E78C7	C49E55B3	C49E373F	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
4143B1DB	41495B40	414E6DC8	415315BE	451869F0	45186 9F0	41314442	41353F70	4139A76A	414346CF
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451865F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	424C25E1	4248B560	425C3943	425E5768
4251F151	424BF7EB	42435B95	422E68A7	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	42E4F1E2	427D0AAD	429D7188	42863661
42936336	42A21B65	42AA3FEC	4292C8C8	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	4159A085	41518991	41740CF0	41EF594A
41B08DCC	419FE202	4194340F	4173CFE0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0
451869F0	451869F0	451869F0	451869F0	451869F0	45186 9F0	44AE5CF5	44AE51FF	44A8462C	44A8397C
44A82BFA	44A81D98	44A80E42	44A7FDFB	451869F0	45186 9F0	451869F0	451869F0	451869F0	451869F0

MAGSAT

CONDENSED ORBIT/ATTITUDE, TAPE

79-094A-01H,02K SPMS-00615

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED SEVEN 9-TRACK, 6250 BPI TAPES WRITTEN IN BINARY. THERE ARE SEVEN 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 AND THEY WERE RESTORED ON THE MRS SYSTEM. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004659	DS004659	D043091	1	11/02/79 - 02/10/80
DR004660	DS004660	D048298	1	11/30/79 - 12/31/79
DR004661	DS004661	D048299	1	12/31/79 - 01/31/80
DR004662	DS004662	D048300	1	01/31/80 - 02/29/80
DR004663	DS004663	D048301	1	02/29/80 - 03/31/80
DR004664	DS004664	D048302	1	03/31/80 - 04/30/80
DR004665	DS004665	D048303	1	04/30/80 - 05/01/80

REQ. AGENT	RD NO.	ACQ. AGENT
DEW		HKH

MAGSAT

79-094A-01H/02K

CONDENSED ORBIT ATTITUDE

This data set consists of 7 COA data tapes. The tapes are 6250 with 1 file of data. The tapes were created on an IBM 360 computer.

D NO.	TIME SPAN
43091	11/02/79-02/10/80
48298,	11/30/79-12/31/79
48299	12/31/79-01/31/80
48300	01/31/80-02/29/80
48301	02/29/80-03/31/80
48302	03/31/80-04/30/80
48303	04/30/80-05/01/80

from CSC/TR-79/6015
"Magsat Data Processing System Program Reference ..."
August 1979

B 32553-000A

79-094A-01H/02K

APPENDIX E - CONDENSED ORBIT AND CONDENSED ORBIT/ ATTITUDE TAPE FORMAT

This appendix defines the record formats for the condensed orbit and condensed orbit/attitude tapes. The condensed orbit tape is a 9-track, 6250-bpi tape with the following attributes: RECFM = FB, LRECL = ~~3096~~ 3096, BLKSIZE = 15480, DEN = 4. It is made up of orbit records only. The condensed orbit/attitude tape is a 9-track, 6250-bpi tape with the following attributes: RECFM = VBS, LRECL = 3388, BLKSIZE = 16944, DEN = 4.

5 x 3096 = 15480

5 x 3388 + 4 = 16944

Record formats are as follows:

ORBIT RECORD: 3096 bytes of data + 4 bytes descriptor = 3100 (if VBS)

Displacement (bytes)	Parameter	Type	Units
0	Zero fill	I*4	
4	Modified Julian Day of first data value	I*4	MJD (See Glossary)
8	Milliseconds of day of first data value	I*4	Milliseconds
12	Time increment between observations	~~R*4~~ I*4	Milliseconds
16	Reference time of coordinate system (epoch) for GHA corresponding to date in byte 24, page C-1.	R*4	MJD at $0^h 0^m 0^s$ UTC
20	Greenwich hour angle (GHA) at epoch	R*4	Radians
24	Position vector X (128 values)	R*4	km
536	Position vector Y (128 values)	R*4	km
1048	Position vector Z (128 values)	R*4	km
1560	Invariant latitude (128 values)	R*4	Degrees

Displacement (bytes)	Parameter	Type	Units
2072	Geomagnetic time (128 values)	R*4	Hours
2584	Dip latitude (128 values)	R*4	Degrees

ATTITUDE RECORD: 3384 bytes of data + 4 bytes descriptor = 3388

Displacement (bytes)	Parameter	Type	Units
0	Attitude quality indicator = 1, intermediate = 2, fine = 3, quicklook	I*4	--
4	Modified Julian Day of first observation	I*4	MJD (See Glossary)
8	Milliseconds of day of first observation	I*4	Milliseconds
12	Time increment between observations	~~R*4~~ I*4	Milliseconds
16	Date data was processed and number of times re-processed	I*4	YYDDDHHNN
20	Number of sets of quaternions in the data record	I*4	
$^{1}_{24}$	First component of quaternion that transforms from sensor platform (A_V, B_V, C_V) coordinates to celestial true-of-date geocentric coordinates (CC) at start time (240 values)	R*4	--
$^{1}_{984}$	Second component of the quaternion defined above (240 values)	R*4	--
$^{1}_{1944}$	Third component of the quaternion defined above (240 values)	R*4	--

Displacement (bytes)	Parameter	Type	Units
2904	Attitude quality flags (240 values; see page D-5)	I*2	--

[1] In order to maintain fourth quaternion precision for fine attitude data (byte 0=2), all four components of a quaternion set are packed in 12-byte fields. The 12-byte field is defined by concatenating those bytes designated for the three components for a given quaternion set, (e.g., the first set is packed in bytes 24, 984, and 1944; the second set in bytes 28, 988, and 1948).

44181
−43873
308 days after day 1
= Day 308

THE ORBIT DATA RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: = 0, indicating satellite position data	*L*1
1	Data type of next record	**L*1
2	Spare	
4	Date of first observation (MJD)	I*4
8	Milliseconds of day for first observation	I*4
12	Time increment between observations (MS)	I*4
16	Greenwich hour angle at epoch	R*4
20	Reference time of coordinate system (MJD + fraction of day)	R*4
24	X inertial coordinate (km, 128 values)	R*4
536	Y inertial coordinate (km, 128 values)	R*4
1048	Z inertial coordinate (km, 128 values)	R*4
1560	Invariant Latitude (128 values)	R*4
2072	Geomagnetic time (128 values)	R*4
2584	Dipole latitude (128 values)	R*4

*8 bit binary value
** On investigator copy only

Definition of MJD:

Day number 1 of 1979 is (MJD −43873).

Thus MJD = 44181 denotes day 308, 1979, which is Nov. 4

THE VECTOR DATA (NEV COORDINATES) CHRONICLE RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: =5, 6, 7, indicating vector x,y, or z observations, respectively, generated from intermediate attitude data =8, 9, 10, for data generated from fine attitude data	*L*1
1	Data type of next record	**L*1
2	Spacecraft status (see record types 2-4)	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time Offset (ms)	R*4
20	Spare	-
24	Vector component observations (gammas; 1024 values)	R*4
4120	Number of points in this record that overlap with the next record of this type	I*2

*8 bit binary value
**On investigator copy only

THE VECTOR DATA (SENSOR PLATFORM COORDINATES) CHRONICLE RECORD [illegible] AS FOLLOWS:

Displacement (bytes)	Parameter
0	Data type: = 2, 3, 4, indicating vector a, b, or c observations, respectively
1	Data type of next record
2	Spacecraft status (5 digit integer - abcde) a = 1, calibration on b = 1, electronic flip on c = 1, x coil on d = 1, y coil on e = 1, z coil on
4	Modified Julian Day of first observation
8	Milliseconds of day of first observation
12	Time increment between observations (ms)
16	Time offset (ms)
20	Spares
24	Fine counts (1024 values, pad = 9999)
2072	Coarse counts (1024 values, pad = 255)
3096	Number of points in this record that overlap with the next record of this type

*8 bit binary value
**On investigator copy only

THE ATTITUDE QUALITY CHRONICLE RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameters	Type
0	Data type: =16, indicating attitude quality data	*L*1
1	Data type of next record	**L*1
2	Spare	I*2
4	Modified Julian Day of first observation	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observations (ms)	R*4
16	Time offset (ms)	R*4
20	Spare	I*4
24	Attitude processing flags (synchronized with every fourth vector observation starting with first observation of record)	I*2

*8 bit binary value
**On investigator copy only

PROCESSING FLAG DEFINITION

A five-character processing flag, ±abcde, is defined as follows:

Character	Description
a	Smoothing character (level of smoothing of final attitude): = 0, no smoothing = 1, linear smoothing = 2, nonlinear smoothing
b	Residual character: = 0, all residuals within boundaries = 1, QUEST* residual and SC1 acceptable, SC2 bad = 2, QUEST residual acceptable, SC1 bad, SC2 acceptable = 3, QUEST residual acceptable, SC1 and SC2 bad = 4, QUEST residual bad, SC1 and SC2 acceptable = 5, QUEST residual bad, SC1 acceptable, SC2 bad = 6, QUEST residual and SC1 bad, SC2 acceptable = 7, QUEST residual SC1, and SC2 bad
c	Gyro and ATS character: = 0, observed gyro point, observed ATS point = 1, observed gyro point, interpolated ATS point = 2, observed gyro point, default ATS value = 3, interpolated gyro data, observed ATS point = 4, interpolated gyro data, interpolated ATS point = 5, interpolated byro data, default ATS value = 6, gyro data point invalid, observed ATS point = 7, gyro data point invalid, interpolated ATS point = 8, gyro data point invalid, default ATS value

*QUEST refers to the attitude determination least squares program.

PROCESSING FLAG DEFINITION (cont'd)

Character	Description
d	Attitude computation character (method of final attitude computation): = 0, with QUEST, using three vectors = 1, with QUEST, using SC1 and SC2 = 2, with QUEST, using SC1 and FSS = 3, with QUEST, using SC2 and FSS = 4, using SC1 and gyro = 5, using SC2 and gyro = 6, using FSS and gyro = 7, not computed
e	Pattern matching character: = 0, SC1 and SC2 valid, identified = 1, SC1 valid, identified; SC2 valid, not identified = 2, SC1 valid, identified; SC2 not valid = 3, SC1 valid, not identified; SC2 valid, identified = 4, SC1 valid, not identified; SC2 valid, not identified = 5, SC1 valid, not identified; SC2 not valid = 6, SC1 not valid; SC2 valid, identified = 7, SC1 not valid; SC2 valid, not identified = 8, SC1 not valid; SC2 not valid

MAGSAT

CHRONICLE DATA TYPES

1. ORBIT

2. SCALAR

3. VECTOR (Spacecraft coordinates - data in counts)

   3.1 A

   3.2 B

   3.3 C

4. VECTOR (Topocentric coordinates - intermediate attitude)

   4.1 X

   4.2 Y

   4.3 Z

5. VECTOR (Topocentric coordinates - fine attitude)

   5.1 X

   5.2 Y

   5.3 Z

6. ATTITUDE QUALITY (For fine attitude only)

TYPE OF CHRONICLE TAPES

Types according to item numbers on previous page. There is a "record type" code in the data which is different from this.

1. CHRONINT CONTAINS DATA TYPES 1, 2, AND 4 intermediate
2. CHRONFIN CONTAINS DATA TYPES 1, 2, 5, AND 6 ' have subtitle
3. CHRONINT/SC CONTAINS DATA TYPES 1, 2, 3, AND 4 ' spacecraft
4. CHRONFIN/INT SAME AS 2 BUT WITH DATA TYPE 4 WHEN 5 UNAVAILABLE

CHRONICLE TAPE FORMATS

INTERNAL FORMAT (IED DATA BASE)

6250 BPI BINARY
BLOCKED - MAX BLOCK SIZE 28,886 BYTES

INVESTIGATOR FORMATS

VARIOUS DENSITIES
BLOCKED AND UNBLOCKED

PAD DATA DENOTED BY 99999.0

THE CHRONICLE SCALAR DATA RECORD FORMAT IS AS FOLLOWS:

Displacement (bytes)	Parameter	Type
0	Data type: = 1, indicating scalar observations	*L*1
1	Data type of next record	**L*1
2	Spare	--
4	Date of first observation (MJD)	I*4
8	Milliseconds of day of first observation	I*4
12	Time increment between observation (ms)	R*4
16	Time offset (ms)	R*4
20	Spare	I*4
24	Scalar observations (gammas - 512 values	R*4
2072	Number of points in this record that overlap with the next scalar record	I*2

*8 bit binary value
**On investigator copy only

CHRONICAL TAPE FORMAT - BINARY

TIME ORDERED

FORTRAN READABLE

A. ORBIT DATA RECORD (128 minutes)

B. SCALAR DATA RECORD (512 values)

C. 3 VECTOR COMPONENT DATA RECORDS (1024 values each)

D. ATTITUDE QUALITY (If in fine topocentric coordinates 256-values)

E. ITEMS B-D REPEATED FOR TIME PERIOD OF ORBIT RECORD

F. SEQUENCE A-E REPEATED

G. EOF

D43091 COA
11/02/79 - 2/10/79
Condensed Orbit Attitude
79-094A-01H,02K

16944 3100

RECORD 1 OF FILE 1
LENGTH = 16944 BYTES

60,000

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441050B4	43FD85C8	43F4E0EA	43EB25AC	43E05E56	43D49672	43C7DAC2	43BA3935	43ABC0DB	439C81D4
438C8D40	437BF52E	436ACC87	435926FA	434718E5	4334B73E	4322177C	42F4F783	C238AA96	C3166095
C3291BE7	C33BA645	C340E97A	C35FCF9C	C371431D	C3822EF4	C3927EB0	C3A21E9A	C3B0FBCF	C3BF0458
C3CC2747	C3D854CC	C3E37E4B	C3ED9671	C3F69148	C3FE6441	C4105064	C410A6FD	C410E9AD	C411182E
C4113253	C4113808	C4112952	C4110650	C410CF3A	C410845E	C4102624	C3F850AA	C3F31A44	C3E9C99E
C3DF6A78	C3D409BC	C3C7B567	C3BA7C76	C3AC6ECE	C39D9D2A	C38E1904	C37DF47D	C36D4248	C35C1593
C34A81F3	C338984E	C32675C3	C3142599	C21BF2A7	4310A932	4322FF3B	43352ED7	43472426	4358CB95
436A11EF	437AE46F	438B30CE	439AE557	43A9F0F4	43B8433F	43C5CC91	43D27E0E	43DE49BA	43E9227E
43F2FC3E	43FBCBDC	44103875	4410A25A	4410F9F1	44113ED0	441170A1	44118F22	44119A25	44119192
44117566	441145B3	441102A1	4410AC6E	4410436C	43FC805F	43F3AB89	43E9C170	43DECCBC	4302D906
43C5F355	43B829CE	43A988B2	439A2952	438A13FE	43795DEF	43681A38	43568CB0	43443906	4331C6C1
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C3C17DF9	C3AF0E80	C39BD1C8	C387DDED	C37349FF	C35E2DEB	C348A262	C332C0B4	C31CA286	C2662A23
42FE50DE	4326198F	433C20D8	4351DFF2	43673CDC	437C1DDF	43906903	43A48041	43B6E106	43C8DEF4
43D9EAF4	43E9F11F	43F8DE5D	44106A0F	4411328C	4411E673	441284F4	4413005B	44137F11	4413D99C
44141C9D	441447D5	44145B22	4414567E	44143A01	441405E0	4413BA6C	44135810	4412DF53	441250D3
4411AD49	4410F583	44102A65	43F4CE81	43E5E168	43D5F0DC	43C50FAC	43B3518D	43A0C806	438D9156
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C35AA0C1	C36F3DE1	C3836180	C396F639	C3A9E619	C3BC1C96	C3CD8580	C3DE0E35	C3EDA301	C3FC3528
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C414A702	C414935A	C414687D	C4142688	C413CD8E	C4135E69	C412D8FB	C41230F8	C4118E0C	C410C9E9
C3FF264F	C3F086AB	C3E0CFD2	C3D0134A	C3BE03E6	C3ABD5B6	C3987DEF	C3847201	C36FC891	C35AA03A
C3450994	C32F2103	C319006B	C22C20D8	451869F0	451869F0	C3823F34	C39842D1	C37D9805	C3626D71
C346CF94	C32AE2C4	C2EC607B	42D67403	43298573	434574D6	436118B6	437C4887	4396E80F	43B0E782
43CA16AE	43E25E19	43F9A129	4410FC44	44124AD0	44138423	4414A6C1	44158148	4416A26F	4417790A
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C3AE1476	C393FA50	C3793C38	C35DF782	C3424A39	C32652FC	C2A30E47	4311FC9D	432E15E0	4349FB24
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4239EFF0	423C3B60	423E5BE5	42404E76	42420B5C	424385DD	4244AD70	42457076	4245C018	424593FA
4244EC78	42430208	424256AF	42408994	423E7BC9	423C3B2A	4239D315	42374CA1	4234AEB6	4231FE6E
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42153B84	4214BE0B	421459E6	42140778	4213C344	421389F7	42135912	42132E89	42130983	4212E862
4212CA83	4212AF45	42129627	42127EC0	4212688D	421253D6	42123FD0	42122C78	421219A0	4212071E
4211F4CB	4211E283	4211D021	4211BD7F	4211AA77	421196DE	42118285	42116D38	421156BA	42113EC1
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C22808E2	C22A18D0	C22B94B7	C22CA20F	C22D68B6	C22E0ABB	C22EA173	C22F3D0E	C22FEAAE	C230ADA4

C2318887	C2327925	C233794D	C2347DF7	C2357797	C236528D	C236F91D	C2378692	C2375823	C236FF2E
C236442D	C235325B	C233D4E0	C23235D5	C2308B9C	C22E4920	C228FEE1	C229701C	C226C596	C223DC77
C220C7F3	C21D8F7C	C21A3A94	C216CFBC	C213540B	C1FCB0EE	C1C36F33	C1898FFD	C14F20E5	C1142F0D
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4413E1F5	44142113	44144866	441457D0	44144F51	44142F07	4413F729	4413A80E	44134224	4412C5F6
44123428	44118D74	4410D2AD	441004B9	43F24940	43E334B9	43D31FF1	43C21DD9	43B04243	439DA1D0
438A51D3	4376683D	4361FB85	434D228E	4337F493	4322890B	42CF79AA	C28A00C0	C31E353A	C3338357
C348EFFD	C35D0009	C37263B1	C3846D99	C399E4E7	C3AC8456	C3BEC74B	C3D009EA	C3E06926	C3EFD2D6
C3FE35C6	C4108B1C	C4117A7D	C412298F	C412C487	C4134B10	C4138C89	C4141717	C4145BC7	C4148B8D
C414A0B7	C414A08A	C4148927	C4145A97	C41414FD	C4138898	C41346BF	C4128CE5	C4121E96	C4116879
C410A44A	C3FC9E3C	C3EDD328	C3D0F3D9	C3CD1201	C3B840AB	C3A89413	C3958198	C380FFA1	C36C4884
C3570B6A	C3416A31	C32B7B50	C3155889	41E34D3E	43171E44	432D3D99	434320C8	43588F80	436DEDC3
4382980E	4396A57A	43A9FDDC	43BC89EA	43CE3357	43DEE4F6	43EE8AD5	43FD1257	4410A6A5	44116832
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MAGSAT

SELECT DATA FOR MODEL W/ ADJ, TAPE

79-094A-01I, 02M SPMS-00614

THESE DATA SETS HAVE BEEN RESTORED. ORIGINALLY THERE WAS ONE 9-TRACK, 1600 BPI TAPE WRITTEN IN BINARY. THERE IS ONE RESTORED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 360 COMPUTER AND WAS RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND THE TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004911	DS004911	D045109	1-15	11/05/79 - 04/20/80

MAGSAT

SELECT DATA FOR FIELD MODEL, TAPE

79-094A-01J, 02N SPMS-00175

THESE DATA SETS HAVE BEEN RESTORED. ORIGINALLY THEY CONTAINED ONE 9-TRACK, 1600 BPI TAPE WRITTEN IN BINARY. THERE IS ONE RESTORED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 360 COMPUTER AND WAS RESTORED ON THE MRS COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBER AND TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR005284	DS005284	D045110	1-15	11/05/79 - 04/20/80

REQ. AGENT	REQ. NO.	ACQ. AGENT
DEW	V0140	HKH

MAGSAT

79-094A-01I/02M

79-094A-01J/02N

SELECT DATA FOR FIELD MODEL WITH AND WITHOUT ATTITUDE ADJUSTMENT

This data set consists of 2 tapes, one for each of the ids. The tapes are 1600 bpi, VBS, 9 track, Bin. Each tape has 15 files on it. The tapes were created on an IBM 360 computer. The D and C numbers are as follows:

79-094A-01I/02M

D#	C#	Files	Time Span
D-45109	C-22390	15	11/5/79-4/20/80

79-094A-01J/02N

D#	C#	Files	Time Span
D-45110	C-22391	15	11/5/79-4/20/80

5/29/81

MAGSAT FINE ATTITUDE DATA TAPE FOR SELECTED TIMES OF 15 QUIET DAYS CORRECTED FOR ATTITUDE BIASES AND EXTERNAL FIELDS

79-094A-01 I
-02 M

The data set consists of MAGSAT scalar and vector component data for 15 magnetically quiet days (November 5, 1979-April 20, 1980). The data for each day is further selected from specified time intervals (see Table 1) judged to be undisturbed. This data is identified in the format description with a flag (IA(22,I) through IA(25,I)) set to the value 2. Data for which the flag is set to 0 is either vector component data for which no fine attitude information was available or data which is outside of the specified time intervals. The data has been corrected for the attitude biases and the external fields identified in Table 2. The scalar data is no longer independent data, but is calculated from the vector component data after the corrections are applied. The attitude and external field correction values were obtained by least squares fitting a parametric magnetic field model to the fine data set for the given day. Data for each day is written on a separate file.

Table 1: Selected Time Intervals

File	Date	Time Intervals (HHMMSS)
1	Nov 5, 79	5000-10400; 105753-112920; 115300-121700; 232820-240000
2	Nov 6, 79	3000-92000; 102450-110350; 112000-114300; 115843-123000; 131000-240000
3	Dec 13, 79	0-54000; 105200-120000
4	Dec 25, 79	0-4800; 13000-61000; 103600-110000; 121000-123300
5	Jan 9, 80	2500-55000; 114835-121140; 155000-165000; 173000-182000
6	Jan 10, 80	11500-34000; 72500-95500; 110000-112100; 115200-130000; 223600-234000
7	Jan 18, 80	3000-6000; 13800-53000; 112800-115100
8	Jan 19, 80	22700-70000; 103600-110700; 112500-124000; 224000-235500
9	Feb 12, 80	0-64000; 101000-112100; 150000-190000; 231300-240000
10	Feb 13, 80	4600-11700; 20000-90000; 130000-152000
11	March 3, 80	3700-10800; 14600-71800; 111000-115600; 122000-140000
12	March 15, 80	3200-73000; 110500-121400; 160000-202000
13	April 18, 80	43000-90000; 171000-181000
14	April 19, 80	4600-10900; 15500-54500; 114400-115900
15	April 20, 80	53500-91500; 12000-130500; 180500-190500

Table 2: Attitude and External Field Corrections

Date	External Field Correction (e_1, e_2, e_3) nT	Attitude Correction (Roll, Pitch, Yaw) arc sec.
Nov 5, 79	25.9; -1.5; -.6	4.; -4.; -14.
Nov 6, 79	20.9; -1.5; -.6	4.; -4.; -14.
Dec 15, 79	13.0; -1.7; -3.1	-11.; -9.; 18.
Dec 25, 79	8.5; -.5; -.3	4.; -22.; 21.
Jan 9, 80	22.5; 2.4; -4.	7.; -9.; 35.
Jan 10, 80	22.5; 2.4; -4.	7.; -9.; 35.
Jan 18, 80	23.2; 2.7; .2	5.; -20.; 53.
Jan 19, 80	23.2; 2.7; .2	5.; -20.; 53.
Feb 12, 80	17.0; 1.5; -2.9	-26; -7; 94
Feb 13, 80	17.0; 1.5; -2.9	-26; -7; 94
March 3, 80	14.2; -.7; -2.8	-22; -8; 94
March 15, 80	9.3; -1.4; -1.5	-35; -3; 79
April 18, 80	22.2; .3; -4.3	-67; -14; 87
April 19, 80	22.2; .3; -4.3	-67; -14; 87
April 20, 80	22.2; .3; -4.3	-67; -14; 87

File 1, line 1 of the data and the FORTRAN source which produced it are shown below.

```
      WRITE(6,100)(IA(L,1),L=1,2),(A(L,1),L=3,7),(A(L,1),L=11,14),
     *  (A(L,1),L=16,18),(IA(L,1),L=22,25),(A(L,1),L=26,27),IA(28,1)
100   FORMAT(1),I5,I10,F6.0,2X,F7.1,F8.3,F10.5,F9.4,F8.0,4F7.0,2X,
     *  2F7.3,/1X,4I7,2F7.3,I7)
```

```
44313        4320 -987.    -665.6  79.900 -79.88026  41.2176    2426.-10572. 41920. 43301. -6671.     0.778  0.6
      2         2        2         2 -0.112  0.037     999-
```

SPECIAL MAGSAT DATA TAPE FORMAT

FOR CORRECTED DATA

15 FILES--ONE DAY ON EACH FILE

The following FORTRAN source reads the unformatted IBM binary data in blocks of 100 entries.

```
REAL*4 A(28,100)
DIMENSION IA (28,100)
EQUIVALENCE (A(1,1),IA(1,1))
READ (Unit) A
```

Array element definitions:

IA(1,I) = MJD
IA(2,I) = Milliseconds of day
A(3,I) = x position in celestial coordinates } Km x is toward vernal equinox
A(4,I) = y position in celestial coordinates }
A(5,I) = time in years from 1900
A(6,I) = geocentric latitude (degrees)
A(7,I) = longitude (degrees) −180 to +180
A(8,I) = not used (reserved for D data)
A(9,I) = not used (reserved for I data)
A(10,I) = not used (reserved for H data)
A(11,I) = N (north component corrected for quaternian bias and external field)
A(12,I) = E (east component corrected for quaternian bias and external field)
A(13,I) = V (vertical component corrected for quaternian bias and external field)
A(14,I) = B (scalar component computed for vector components)
IA(15,I) = altitude in meters (above ~~6321.0~~ km) (6371.0 km)
A(16,I) = Z position in celestial coordinates
A(17,I) = quaternian q_1 (not corrected)
A(18,I) = quaternian q_2 (not corrected)
IA(19,I) = not used
IA(20,I) = not used
IA(21,I) = not used
IA(22,I) = flag for N component 0-non-selected data, 2-selected data
IA(23,I) = flag for E component 0-non-selected data, 2-selected data
IA(24,I) = flag for V component 0-non-selected data, 2-selected data
IA(25,I) = flag for B component 0-non-selected data, 2-selected data
A(26,I) = quaternian q_3 (not corrected)
A(27,I) = quaternian q_4 (not corrected)
IA(28,I) = not used

045109
79-094A-01I/02m
11/05/79 - 04/20/80
Select Field Model
w/o Attitude Adj.

DUMP OF TAPE D01

INPUT TAPE D01 ON MT1
DATA INPUT H9 NF 15 FL 1 1 1 SR 15 1 1 SR 15 LAST 1

FILE 1 RECORD 1 LENGTH 22404BYTES

(0)	57840000	2BC40000	0000AC96	00000056	C398BE07	436214FE	424FD80C	42406A88	4267AA09	00000000
(40)	00000000	00000000	44245BE5	C227434A	44C5986E	44C8E9AC	00056968	4417B23E	40363708	BF5DBB29
(80)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0E28EBA	4069FD4B	000003E7
(120)	0000AC96	0000F14E	C3A9C09A	4376BC04	424FD80C	423C7A2E	42652439	00000000	00000000	00000000
(160)	442CC35C	423F783C	44C30B8E	44C81DB1	00056BCF	4416DCF1	403E50F8	BF93C3C4	00000000	00000000
(200)	00000000	00000000	00000000	00000000	00000000	C0E0719E	4069CB44	000003E7	0000AC96	0001E1CD
(240)	C3B9E3A5	438AC24D	424FD80C	4238844E	42631D91	00000000	00000000	00000000	4435C40B	4295095C
(280)	44BEA169	44C61182	00057D5D	4415EB03	40461F20	BFD3457F	00000000	00000000	00000000	00000000
(320)	00000000	00000000	00000000	C0DE39E1	40692AD7	000003E7	0000AC96	0002D52C	C3C94895	439E530A
(360)	424FD80C	42347D5F	4261684C	00000000	00000000	00000000	443F543D	42C5FFD4	44BE211E	44C2B79B
(400)	0005772C	4414D9E4	404DA754	C011A6C8	00000000	00000000	00000000	00000000	00000000	00000000
(440)	00000000	E0DB7A7D	4068FE46	000003E7	0000AC96	0003C5A9	C3D77ED1	43B0DF1D	424FD80C	42307F72
(480)	425FF5B7	00000000	00000000	00000000	4448F736	42CAD0A2	44AFA560	44BE3344	00057FFD	4413B163
(520)	40559317	C014DC48	00000000	00000000	00000000	00000000	00600000	00000000	00000000	C0D8A7A2
(560)	40681BB5	000003E7	0000AC96	0004B628	C3E4A4C1	43C28BBC	424FD80C	422C7F7A	425EAFEB	00000000
(600)	00000000	00000000	44528F91	42AC323D	44A51535	44B89400	00058AD9	44126FE9	405CDB43	C0193FA6
(640)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0D583EA	40676140	000003E7
(680)	0000AC96	0005A79C	C3F0B582	4303531C	424FD80C	42287A3D	425D8AA9	00000000	00000000	00000000
(720)	445BEFB7	4268D1A1	44986386	44B1F963	000597BB	441115A9	406445E6	C01D01EA	00000000	00000000
(760)	00000000	00000000	00000000	00000000	00000000	C0D1FC71	4066B140	000003E7	0000AC96	0006981A
(800)	C3FB899E	43E2FE33	424FD80C	42247B8B	425C8059	00000000	00000000	00000000	4464C259	4174D1E3
(840)	4489BC2D	44AAA7DA	0005A674	43FA71E8	406BB9BC	C0207408	00000000	00000000	00000000	00000000
(880)	00000000	00000000	00000000	C0CE6C33	40655461	000003E7	0000AC96	00078897	C4105209	43F18B1C
(920)	424FD80C	422076CC	425B89FC	00000000	00000000	00000000	446CB2DA	C277806A	44792DF2	44A2DF37
(960)	0005B6F3	43E24CB0	40729E5B	C024C30A	00000000	00000000	00000000	00000000	00000000	00000000
(1000)	00000000	C0CA5BEA	40647D18	000003E7	0000AC96	00087A86	C410D7AB	43FEFB98	424FD80C	421C6F39
(1040)	425AA1E7	00000000	00000000	00000000	4473D71E	C3113C4C	4466DEE2	449AED6B	0005C946	4308E220
(1080)	4079DA6E	C027FBA4	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0C62DE8
(1120)	406310F1	000003E7	0000AC96	00096B04	C4114746	4410B163	424FD80C	42186E79	4259C781	00000000
(1160)	00000000	00000000	4479A606	C31B160B	44532B96	44935F3F	0005DD11	43AEA04F	4080B558	C02BC3D2
(1200)	00000000	00000000	00000000	00000000	00000000	00000000	C0C1C401	4061847E	000003E7	0000AC96
(1240)	0000AC96	000A5B82	C411A135	44115E1C	424FD80C	42146EAE	4258F6BB	00000000	00000000	00000000
(1280)	447DEFC8	C3261A03	443E547B	448C898F	0005F259	439382CE	40874B52	C02F919E	00000000	00000000
(1320)	00000000	00000000	00000000	00000000	00000000	C0BCE795	40605A26	000003E7	0000AC96	000B4C00
(1360)	C411E513	4411F519	424FD80C	42107016	4258 2D6D	00000000	00000000	00000000	44808CAF	C332C563
(1400)	4428B495	4486E0AF	00060903	4377AC1C	408E285C	C032A11A	00000000	00000000	00000000	00000000
(1440)	00000000	00000000	00000000	C0B80C56	405E499D	000003E7	0000AC96	000C3DEF	C41212CB	4412765A
(1480)	424FD80C	41C6CCDC	425768AA	00000000	00000000	00000000	44815DB6	C340EC77	4412A979	4482C4A6
(1520)	00062109	435B1385	40946BB9	C0367C51	00000000	00000000	00000000	00000000	00000000	00000000
(1560)	00000000	C0B2C8AC	405C99CF	000003E7	0000AC96	000D2E6D	C41229A9	4412DFC6	424FD80C	41871409
(1600)	4256A93E	00000000	00000000	00000000	448058AF	C351571A	C3318B11	44807C00	00063A10	433E3453
(1640)	409AA1F2	C039AF24	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0AD5820
(1680)	405AD30C	000003E7	0000AC96	000E20D6	C41229DE	4413324C	424FD80C	4146F600	4255EB22	00000000
(1720)	00000000	00000000	447D7F63	C36521A2	C41864B4	448000A3	00065444	4320CBD3	40A0C720	C03CBBD2
(1760)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0A7E07D	40586767	000003E7
(1800)	0000AC96	000F1154	C412137C	44136C4A	424FD80C	40778E87	4255301A	00000000	00000000	00000000
(1840)	4478FF11	C37CB3C4	C42C6188	44811D4B	00066F23	42375DD3	40A64D6E	C0403BCB	00000000	00000000
(1880)	00000000	00000000	00000000	00000000	00000000	C0A20442	4056A069	000003E7	0000AC96	001003BE
(1920)	C411E653	44138E78	424FD80C	C1386478	425473F4	00000000	00000000	00000000	4472FDD3	C3992B2C
(1960)	C43EF72D	44837370	00068AF7	C31A205E	40AC1643	C042F7DA	00000000	00000000	00000000	00000000
(2000)	00000000	00000000	00000000	C09C0A70	405431A6	000003E7	0000AC96	0010F43B	C411A365	44139832
(2040)	424FD80C	C1779CA4	42538889	00000000	00000000	00000000	446BDF4C	C3BA4F6D	C44F87EF	44868698
(2080)	0006A727	C3375A2B	40B1770E	C046057F	00000000	00000000	00000000	00000000	00000000	00000000
(2120)	00000000	C095ECD4	40519E63	000003E7	0000AC96	0011E534	C4114A9E	44138902	424FD80C	C1B6D037
(2160)	4252FAC6	00000000	00000000	00000000	4463EBB8	C3E01BE6	C45E0B6F	4489EE24	0006C3DA	C3545EB4
(2200)	40B67B9E	C0490FF7	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C08F7480
(2240)	404F7D44	000003E7	0000AC96	0012D5B3	C410DCD8	44136380	424FD80C	C1F5BCEB	42523A2D	00000000
(2280)	00000000	00000000	44589602	C410A03E	C46A54AF	448D514B	0006E0D2	C37BED01	40BB8363	C04B8163

```
( 21720)  00000000  00000000  00000000  41100000  000003E7  0000AD3D  0068A07F  C3451641  432CA721  42504D19
( 21760)  C24EB54E  C259C187  00000000  00000000  00000000  43D8D8E4  C4444D13  44A44D72  44B272F1  00055A92
( 21800)  C419BFC0  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 21840)  00000000  41100000  000003E7  0000AD3D  006918FC  C349F2C9  433A758B  42504D19  C24D0985  C25F563E
( 21880)  00000000  00000000  00000000  4410F0F3  C443AFF8  44A4968B  44B2C47B  00056176  C4199849  00000000
( 21920)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  41100000
( 21960)  000003E7  0000AD3D  00699178  C34EB7C9  43483147  42504D19  C24B478F  C263A97A  00000000  00000000
( 22000)  00000000  441480A7  C442F521  44A47B53  44B2C48C  00056870  C41968AB  00000000  00000000  00000000
( 22040)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  41100000  000003E7  0000AD3D
( 22080)  006A09F4  C35363CE  4355D61A  42504D19  C2497694  C2671858  00000000  00000000  00000000  4418281B
( 22120)  C441D67D  44A41791  44B2732E  00056F7A  C41930F6  00000000  00000000  00000000  00000000  00000000
( 22160)  00000000  00000000  00000000  00000000  00000000  41100000  000003E7  0000AD3D  006A8270  C357F561
( 22200)  43635FB2  42504D19  C2479B1D  C269E1FE  00000000  00000000  00000000  441BD2DD  C4405E63  44A36A4D
( 22240)  44B1D608  00057695  C418F13E  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 22280)  00000000  00000000  00000000  41100000  000003E7  0000AD3D  006AFAED  C35C6B1E  4370C9E8  42504D19
( 22320)  C245B81C  C26C318F  00000000  00000000  00000000  442D483C  442C3112  C4A5263B  44B0DAE0  00057DBD
( 22360)  C418A997  408A9269  40D2B171  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 22400)  4012F9E3

FILE     15  RECORD      13  LENGTH      1488YTES
(     0)  00940000  00900200  00000000  00000000  00000000  00000000  402AA624  4048E0AC  000003E7  0000AD3D
(    40)  05078E59  C3866514  43EDD59A  42504D19  C231A886  C251503A  00000000  00000000  00000000  4447579E
(    80)  4418CB69  C45A9023  4475ECA3  0005D04F  C4141A5D  407E5AED  40CC3FC3  00000000  00000000  00000000
(   120)  00000000  00000000  00000000  00000000  402CE454  404C6728  000003E7
```

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
15	13	14	22404	0	0	0	0	0	0

EOJ DUMP STOPPED AFTER FILE 15 # OF PERMANENT READ ERRORS 0

START TIME 05/25/82 14:11:44 STOP TIME 05/25/82 14:12:32

File 15
First Record

```
$$ /
$ASS IN TD3
$EXEC TPDUPC BS
```

D 45110
79-094A-01J/02N
11/05/79 - 04/20/80
Select Field Model
w/ Att. ADJ.

DUMP OF TAPE DO-2

INPUT TAPE DO-2 ON MT4
DATA INPUT H9 NF 15 FL 1 1 1 SR 15 1 1 SR 15 LAST 1

FILE 1 RECORD 1 LENGTH 22404BYTES

(0)	57840000	2BC40000	0000AC96	00000056	C398BE07	436214FE	424FD80C	42406A88	4267AA09	00000000
(40)	00000000	00000000	442451B9	C228CE7D	44C5AF70	44C8FDEC	00056968	4417B23E	403637DB	BF5DBB29
(80)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0E28EBA	4069FD4B	000003E7
(120)	0000AC96	0000F14E	C3A9C09A	4376BC04	424FD80C	423C7A2E	42652439	00000000	00000000	00000000
(160)	442CB783	423E0E33	44C321A6	44C83010	00056BCF	4416DCF1	403E50F8	BF93C3C4	00000000	00000000
(200)	00000000	00000000	00000000	00000000	00000000	C0E0719E	4069CB44	000003E7	0000AC96	0001E1CD
(240)	C3B9E3A5	438AC24D	424FD80C	4238844E	42631D91	00000000	00000000	00000000	4435B699	4293C6E6
(280)	44BEB678	44C62260	0005705D	4415EB03	40461F20	BFD3457F	00000000	00000000	00000000	00000000
(320)	00000000	00000000	00000000	C0DE39E1	40692AD7	000003E7	0000AC96	0002D52C	C3C94895	439E530A
(360)	424FD80C	42347D5F	4261684C	00000000	00000000	00000000	443F4544	42C4EB9B	44B83504	44C2C653
(400)	0005772C	4414D9E4	404DA754	C011A6C8	00000000	00000000	00000000	00000000	00000000	00000000
(440)	00000000	C0DB7A7D	4068FE46	000003E7	0000AC96	0003C5A9	C3D77ED1	43B0DF1D	424FD80C	42307F72
(480)	425FF5B7	00000000	00000000	00000000	4448E6C6	42C9EE8E	44AFB808	44BE3F5F	00057FFD	4413B163
(520)	40559317	C014DC48	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0D8A7A2
(560)	40681BB5	000003E7	0000AC96	0004B628	C3E4A4C1	43C28BBC	424FD80C	422C7F7A	425EAFEB	00000000
(600)	00000000	00000000	44527DC4	42AB827F	44A52682	44B89C0F	00058AD9	44126FE9	405CDB43	C0193FA6
(640)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0D583EA	40676140	000003E7
(680)	0000AC96	0005A79C	C3F0B582	43D3531C	424FD80C	42287A3D	425D8AA9	00000000	00000000	00000000
(720)	445BDCA1	4268573D	44987361	44B1FCF3	000597BB	441115A9	406445E6	C01D01EA	00000000	00000000
(760)	00000000	00000000	00000000	00000000	00000000	C0D1FC71	4066B140	000003E7	0000AC96	0006981A
(800)	C3FB899E	43E2FE33	424FD80C	42247B8B	425C8059	00000000	00000000	00000000	4464AE0E	41708CF0
(840)	4489CA85	44AAA740	0005A674	43FA71E8	406BB9BC	C0207408	00000000	00000000	00000000	00000000
(880)	00000000	00000000	00000000	C0CE6C33	40655461	000003E7	0000AC96	00078897	C4105209	43F18B1C
(920)	424FD80C	422076CC	425B89FC	00000000	00000000	00000000	446CBD7B	C27792C8	44793AB2	44A2DAEB
(960)	0005B6F3	43E24CB0	40729E5B	C024C30A	00000000	00000000	00000000	00000000	00000000	00000000
(1000)	00000000	C0CA5BEA	40647D18	000003E7	0000AC96	00087A86	C410D7AB	43FEFB98	424FD80C	421C6F39
(1040)	425AA1E7	00000000	00000000	00000000	4473C0BD	C3113A52	4466E9FB	449AE38E	0005C946	43C8E220
(1080)	4079DA6E	C027FBA4	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0C62DE8
(1120)	406310F1	000003E7	0000AC96	00096B04	C4114746	4410B163	424FD80C	42186E79	4259C781	00000000
(1160)	00000000	00000000	44798EC4	C3181140	445334FE	44935036	0005DD11	43AEA04F	4080B558	C02BC3D2
(1200)	00000000	00000000	00000000	00000000	00000000	00000000	C0C1C401	4061847E	000003E7	0000AC96
(1240)	0000AC96	000A5B82	C411A135	44115E1C	424FD80C	42146EAE	4258F6BB	00000000	00000000	00000000
(1280)	447DD7C2	C32612C1	443E5C23	448C765F	0005F259	439382CE	40874B52	C02F919E	00000000	00000000
(1320)	00000000	00000000	00000000	00000000	00000000	C0BCE795	40605A26	000003E7	0000AC96	000B4C00
(1360)	C411E513	4411F519	424FD80C	42107016	42582D6D	00000000	00000000	00000000	44807401	C332BC00
(1400)	4428BA7D	4486C9C0	00060903	4377AC1C	408E285C	C032A11A	00000000	00000000	00000000	00000000
(1440)	00000000	00000000	00000000	C0B80C56	405E499D	000003E7	0000AC96	000C3DEF	C41212CB	4412765A
(1480)	424FD80C	41C6CCDC	425768AA	00000000	00000000	00000000	44814480	C340E175	4412AD93	4482AAE4
(1520)	00062109	435B1385	40946BB9	C0367C51	00000000	00000000	00000000	00000000	00000000	00000000
(1560)	00000000	C0B2C8AC	405C99CF	000003E7	0000AC96	000D2E6D	C41229A9	4412DFC6	424FD80C	41871409
(1600)	4256A93E	00000000	00000000	00000000	44803F14	C3514AE4	C331662D	448061E4	00063A10	433E3453
(1640)	409AA1F2	C039AF24	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0AD5820
(1680)	405AD30C	000003E7	0000AC96	000E20D6	C41229DE	4413324C	424FD80C	4146F600	4255EB22	00000000
(1720)	00000000	00000000	447D6583	C36514B1	C4186432	447FE4DE	00065444	4320CBD3	40A0C720	C03CBBD2
(1760)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C0A7E07D	40586767	000003E7
(1800)	0000AC96	000F1154	C412137C	44136C4A	424FD80C	40778E87	4255301A	00000000	00000000	00000000
(1840)	4478E510	C37CA6C6	C42C62D4	44810264	00066F23	42375DD3	40A64D6E	C0403BCB	00000000	00000000
(1880)	00000000	00000000	00000000	00000000	00000000	C0A20442	4056A069	000003E7	0000AC96	001003BE
(1920)	C411E653	44138E78	424FD80C	C1386478	425473F4	00000000	00000000	00000000	4472E3D6	C3991E70
(1960)	C43EFA41	44835D6B	00068AF7	C31A205E	40AC1643	C042F7DA	00000000	00000000	00000000	00000000
(2000)	00000000	00000000	00000000	C09C0A70	405431A6	000003E7	0000AC96	0010F43B	C411A365	44139832
(2040)	424FD80C	C1779CA4	4253B889	00000000	00000000	00000000	446BC579	C3BA4367	C44F8CC3	4486731C
(2080)	0006A727	C3375A2B	40B1770E	C046057F	00000000	00000000	00000000	00000000	00000000	00000000
(2120)	00000000	C095ECD4	40519E63	000003E7	0000AC96	0011E534	C4114A9E	441389D2	424FD80C	C1B6D037
(2160)	4252FAC6	00000000	00000000	00000000	4463D230	C3E01103	C45E11FF	4489E008	0006C3DA	C3545EB4
(2200)	40B67B9E	C0490FF7	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C08F7480
(2240)	404F7D44	000003E7	0000AC96	0012D5B3	C410DCD8	4413638D	424FD80C	C1F5BCEB	42523A2D	00000000
(2280)	00000000	00000000	445B7CEB	C4109FA4	C46A5CEF	448D468E	0006E0D2	C370ED01	40B88363	C04B8753

```
( 21720)  00000000  00000000  00000000  41100000  000003E7  0000AD3D  0068A07F  C3451641  432CA721  42504D19
( 21760)  C24EB54E  C259C187  00000000  00000000  00000000  43D8D8E4  C4444D13  44A44D72  44B272F1  00055A92
( 21800)  C419BFC0  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 21840)  00000000  41100000  000003E7  0000AD3D  006918FC  C349F2C9  433A758B  42504D19  C24D0985  C25F563E
( 21880)  00000000  00000000  00000000  4410F0F3  C443AFF8  44A4968B  44B2C47B  00056176  C4199849  00000000
( 21920)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  41100000
( 21960)  000003E7  0000AD3D  00699178  C34EB7C9  43483147  42504D19  C24B478F  C263A97A  00000000  00000000
( 22000)  00000000  441480A7  C442F521  44A47B53  44B2C48C  00056870  C41968AB  00000000  00000000  00000000
( 22040)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  41100000  000003E7  0000AD3D
( 22080)  006A09F4  C35363CE  4355D61A  42504D19  C2497694  C2671858  00000000  00000000  00000000  44182818
( 22120)  C441D67D  44A41791  44B2732E  00056F7A  C41930F6  00000000  00000000  00000000  00000000  00000000
( 22160)  00000000  00000000  00000000  00000000  00000000  41100000  000003E7  0000AD3D  006A8270  C357F561
( 22200)  43635FB2  42504D19  C2479B1D  C269E1FE  00000000  00000000  00000000  441BD2DD  C4405E63  44A36A4D
( 22240)  44B1D608  00057695  C418F13E  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 22280)  00000000  00000000  00000000  41100000  000003E7  0000AD3D  006AFAED  C35C6B1E  4370C9E8  42504D19
( 22320)  C245B81C  C26C318F  00000000  00000000  00000000  442D48CE  442C36E2  C4A53464  44B0E9A9  00057DBD
( 22360)  C418A997  408A9269  40D2B171  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 22400)  4012F9E3
```

File 15 First Record

```
FILE      15  RECORD      13  LENGTH     148BYTES
(      0)  00940000  00900200  00000000  00000000  00000000  00000000  402AA624  4048E0AC  000003E7  0000AD3D
(     40)  05078E59  C3866514  43EDD59A  42504D19  C231A886  C251503A  00000000  00000000  00000000  44474ABA
(     80)  4418CB98  C45A9A97  4475EEF8  0005D04F  C4141A5D  407E5AED  40CC3FC3  00000000  00000000  00000000
(    120)  00000000  00000000  00000000  00000000  402CE454  404C6728  000003E7
```

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
15	13	14	22404	0	1	0	0	1	1

```
EOJ        DUMP STOPPED AFTER FILE   15        # OF PERMANENT READ ERRORS  0

START TIME 05/25/82  14:22:41        STOP TIME 05/25/82  14:24:22
```

```
$$
$ASS IN MT2
$EXEC TPDUMP BS
```

MAGSAT

INVESTIGATOR-B QUIET TIME DATA

79-094A-01K, 020 SPMS-00415

THESE DATA SETS HAVE BEEN RESTORED. THERE WERE ORIGINALLY THREE 9-TRACK, 6250 BPI TAPES, BLOCKED, WRITTEN IN BINARY. THE FIRST TWO D TAPES HAD 3 C TAPES THAT WERE UNBLOCKED AND THE THIRD D TAPE HAD JUST ONE C TAPE, UNBLOCKED. THE C TAPES WERE 9-TRACK, 1600 BPI. ALL OF THE D AND C TAPES WERE RESTORED. THERE ARE FIVE 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 AND WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D OR C NUMBER AND TIME SPAN IS AS FOLLOWS:

DR#	DS#	D,C#	FILES	TIME SPAN
DR005339	DS005339	D045320	1	11/02/79 - 01/19/80
DR005340	DS005340	D046637	1	01/19/80 - 03/26/80
DR005341	DS005341	D046638	1	03/27/80 - 05/19/80
DR005342	DS005342	C021758	1	11/02/79 - 12/03/79
		C021759	2	12/03/79 - 01/08/80
		C021760	3	01/08/80 - 01/19/80
DR05343	DS005343	C021761	1	01/19/80 - 02/21/80
		C021762	2	02/21/80 - 03/19/80
		C021763	3	03/19/80 - 03/26/80
		C021764	4	03/27/80 - 05/19/80

REQ. AGENT	RD #	ACQ. AGENT
DEW		HKH

MAGSAT

79-094A-01K/020

INVESTIGATOR B QUIET TIME DATA

This data set consists of 3 tapes. The tapes were created on an IBM 360 computer, and are 9 track, BIN, with 1 file of data. The 'D' tapes are 6250 BPI and the 'C' tapes are 1600 BPI. The 'D' and 'C' numbers and time spans follow:

D#	C#	Time Span
D-45320	C-21758 C-21759 C-21760	11/02/79 - 01/19/80
D-46637	C-21761 C-21762 C-21763	01/19/80 - 03/25/80
D-46638	C-21764	03/27/80 - 05/19/80

D 46637
Inves B Quiet time
1/19/80 - 3/26/80
79-094A-01K,020

FECCFD 1 CF FILE 1
LENGTH = 30000 BYTES


```
75300000 08E80000 00000001 00000002 C00CACE1 C00004E3 422034C7 41291C50 421462E2 C11DED0C
002A8CA8 00554ECD C1651241 415AED1B C26A5FCF 423DF3A9 00000011 C0000011 451869F0 451869F0
451869F0 451869F0 451869F0 451869F0 41300000 41300000 41900000 41E00000 C299E666 C2E1E666
41E00000 41C00000 C2116666 C2333333 42105C62 415AC5C5 40404040 D4C7E2F4 F8F17EF2 40404040
40404040 40404040 40404040 40404040 40404040 40404040 404040D4 C7E2E34C F461F8F1 60F25C40
4040D5D6 40C5E7E3 40404040 C6D6D9C4 C1E34CF2 C9F3C6F6 C6F1F14B F45D4040 40404040 40404CF1
F46BF65D 40C5C7D6 C3C840F1 F9F6F04B 40404040 40404040 0000000E C000000E 00000000 437BC000
4418E333 00000000 C4752333 C37CC26F 434FFD71 433A9E96 C2D9316E 4230778C 42480EE3 42127FF3
4155D5D0 C132A5E3 41287D56 C11AA71E 3FA6E679 C0000000 00000000 C0000000 4415E4E3 C37A4D9A
43ED3666 C3885029 4330E7C7 4316ED37 42410396 C23B2E30 416B7AE1 41A722C1 C13CC6A8 C115161E
3F68C88C C06872E0 00000000 00000000 00000000 C3E517E7 C2C79810 4367F7E5 434E363C 4318CE19
43105144 4229E25E 411A14E4 C03C63F1 41167AE1 4126CA51 C11C04EA C0314E3C 408226E1 00000000
00000000 00000000 C314E517 4310F204 C2FC3A1D 43340FE7 C31A372F C24A4FEC C2EFF6C9 4214E7ED
C1AE58E2 C1C1FE16 C159DED3 41272546 C0268DE9 C0944DC1 00000000 C000C000 00000000 42D428E4
C3100B37 42345E8C C3129D37 42C61C29 C2A1FF3B 4137923A C1C24C96 C17399E4 4197CE92 C11D3127
4031BDA5 40CEF34D C022617C 00000000 00000000 00000000 422DDBE1 4296CE73 C2969AE1 C24CE461
425C56E4 C23013F1 41CD6E2F 406EECCC 41465C92 C13916F0 4147E426 C0E119CE 408A43FE 40CA3055
00000000 00000000 00000000 C1E99EA6 425D3B62 4246F65E C22B0666 C1227B4A 4211464C C26B9021
41A48794 41280625 C11078C5 413517C2 C05CAC6E C07E4A23 C0E3B646 C0000000 00000000 00000000
C252E64C C21E2E4F C152FD22 41FE9A6E 4211EEE6 C2170134 C19F2C3D C11D9F07 4161432D 416E17C2
40A978D5 4115E979 C036872E 4028A050 00000000 00000000 00000000 4173E717 C2118F83 413C2CA5
C2163EED 419228F6 4210244C C1D4C3C3 C1ECE83E C0D2A3C5 4116A36E 412463F1 411801A3 4050DEC3
C0DED917 00000000 00000000 00000000 C214F113 41F79C97 416A7D56 C1510000 C16D5A86 418FDE8C
419AD917 C15AC28F 4122F766 C150C227 413130EE C0A0E0F2 C69EEEA7 402CE4BE 00000000 00000000
00000000 4113CE23 405A0903 412E5810 415CF9C9 C1440CE4 C024AF4F C1150B0F 4131EE63 C038D4FE
C166EFC5 C083404F 411E645A C02B0E9A C0164C30 00000000 00000000 00000000 40DA0275 411F3A93
C118E8EE C13385F0 407CC63F C04FAACE C125B3D0 C041C14E C117A9FC C11E17C2 4111A71E 41383D71
40D02DE0 405346DC 00000000 00000000 0000006C 40673150 409E2EB2 412483E4 C1163D71 406288CE
4026C419 C041DE6A 401EA4A9 BF15B574 C1157E60 40809C2E 40ECF41F EF25460E C07D4FCF 00000000
00000000 00000000 C076A7F0 40424745 41135C29 C0351EBE C0E15B57 C0169AD4 400C0EEF 40428F5C
40FA8C15 40353F7D C01E703E C05C3C9F C0EB923A 40721965 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 42198027 C1AE97F6 C15EF213 C0DDD97F 40ECF41F 4118A027 411145A2 00000000 00000000
00000000 00000000 00000000 00000000 C2166DC9 41CC79A7 407FEC57 C169367A 411CC227 C11D4C30
412379A7 C1273ECD 00000000 00000000 00000000 00000000 00000000 00000000 C1CDEEEE C214C8A1
41E17A78 C12DC97F C16E8CE7 C03E8EAC 40EE0DED 4026594B 00000000 00000000 00000000 00000000
00000000 00000000 413F295F 411404EA C195CFAE C075182B 40BFF2E5 C134EA4E 408F1412 40A617C2
00000000 00000000 00000000 00000000 00000000 00000000 C0685F07 C11EA512 415E6E51 C140CE70
C172CFAB 4118A858 40E5C639 C0E0EBEE 00000000 00000000 00000000 00000000 00000000 00000000
4111E2EE 4118096C C11EE2EE 4138E3ED 40A00000 C1295E57 40487E03 C11A97EC 00000000 00000000
00000000 00000000 00000000 00000000 C11E92A3 C12B4C30 C0EDC5D6 41126A7F 409D566C 413D7732
C1156944 411664C3 00000000 00000000 00000000 00000000 00000000 00000000 C11476C9 40F10CB3
40FDE44D C03EC289 C0816F00 C0AF3B64 411CC77A 4117ECC6 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
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00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 451869F0 451869F0 451869F0 0EC40000
00000002 00000002 0000ACE1 0015106E 000004E3 44133372 C25334B7 C25330DD C253293C C2531DE0
C2530EDD C252FC49 C252E642 C252CCE7 C252E05C C25290C6 C2526E49 C2524910 C252213E C251F6FF
C251CA73 C2519EC4 C2516B11 C2513E60 C251042C C250CE39 C25096BE C2509DDA C25023A0 C24FE82F
C24FAB98 C24F6DEC C24F2F44 C24EEFAA C24EAF36 C24E6DEF C1BE2969 C1E96211 C21148EF C213F277
C21691C6 C21924BB C21EABF0 C21E1CD6 C2207E60 C222CD75 C2250E67 C2272EEC C2294060 C22B3D0C
C22D2518 C22EF89C C230B83A C232644E C233FDA2 C235E4BB C236FA79 C2389F74 C239E490 C23AFA6A
C23C31D2 C23D5E90 C23E7838 C23F6696 C2408D34 C2416ECB 441A7AE0 441A7E4F 441A7EEC 441A7C2E
441A7C9A 441A7D08 441A7D77 441A7DE6 441A7E55 441A7EC4 441A7F34 441A7FA3 441A8014 441A8084
441A80F4 441A8165 441A81D5 441A8246 441A82B6 441A8327 441A8399 441A840A 441A847B 441A84ED
441A855F 441A85D0 441A8642 441A86B4 441A8726 441A8799 4214E1A1 4214D2B2 4214C41E 4214B5E4
4214A804 42149A7A 42148D46 42148066 421473CE 4214679A 42145BAA 4214500E 421444AA 4214398E
42142EA3 42142402 421419A1 42140F7F 4214059A 4213FEFC 4213F27F 4213E947 4213E044 4213D777
4213CEDC 4213C670 4213BE32 4213B622 4213AE40 4213A6EE 42456444 42453EC5 42450C96 4244DFE8
4244B233 42448406 4244553C 424425D2 4243F5D3 4243C53F 4243941E 42436266 4243302E 4242FC76
4242CA3D 4242968A 4242625E 42422CEE 4241F8A6 4241C325 42418D37 424156E5 4241202E 4240E913
4240E19D 424079CA 424041A2 42400922 423FD052 423F9731 C2366FFB C2366129 C23671AD C2366184
```

42410396	C23E2B30	416E7AE1	41A722D1	C13CC6A8	C115161E	3F6EDBEC	C06E72E0	00000000	00000000
00000000	C38517D7	C2C79810	4367F785	434E363D	4318CE19	43105144	4229E25E	411A14E4	C03C63F1
41167AE1	4126DA51	C11C04EA	C0314E3C	40822681	00000000	00000000	00000000	C314E517	4310F204
C2FC3A1D	43340FE7	C31A372F	C24A4FEC	C2EFF6C9	4214E76D	C1AE58E2	C1C1FE16	C159DED3	4127254E
C0268DE9	C0944D01	00000000	00000000	00000000	42D42EE4	C3100B37	42345EEC	C3129D37	42C61C29
C2A1FF3B	4137923A	C1C24C98	C17359B4	4197CB92	C11D3127	4031BDA5	40CEF34D	C022617C	00000000
00000000	00000000	422DDBE1	42960873	C2969AE1	C24DE461	425C5EB4	C23013F1	41DD6E2F	406EECC0
41465C92	C13916F0	4147E426	C0E119CE	408A43FE	40DA3055	00000000	00000000	00000000	C1E99EA6
425D3B02	4246F858	C22B0666	C1227B4A	4211464C	C26B9021	41A48794	41280625	C11078D5	413517C2
C05CAC08	C07B4A23	C083B646	00000000	00000000	00000000	C252864C	C21B2E4F	C152FD22	41FE9A6B
4211EEE6	C2170134	C19F2C3D	C11D5F07	4161432D	416E17C2	40A978D5	4115E579	C036872B	4028A090
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C1ECE83E	C0D2A305	4116A36E	412463F1	411801A3	4050DED3	C0DED917	00000000	00000000	00000000
C214F113	41F79097	418A7D56	C1510000	C16D5A86	418FDBEC	419AD917	C15AC28F	4122F766	C150C227
413130EE	C0A0E0F2	C098E8A7	402C84E6	00000000	00000000	00000000	4113DB23	405A0903	412E5810
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C0164C30	00000000	00000000	00000000	40DA0275	411F3A93	C118B8BB	C13385F0	407CC63F	C04FAACE
C125E3D0	C041D14E	C117A9FC	C11E17C2	4111A71E	41383D71	40D02DE0	40534EDC	00000000	00000000
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C1157660	4080902E	40ECF41F	EF25460E	C07D4FDF	00000000	00000000	00000000	C076A7F0	40424745
41135C29	C0351EB8	C0815B57	C0169AD4	40DC0EBF	40428F5C	40FA8C15	40353F7D	C01E703B	C05C3C9F
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00000000	00000000	451869F0	451869F0	451869F0	C8E80000	00000001	00000001	00001C24	000008C2
424A10EE	41E3C57E	42218441	41E67939	C4DEDCC0	C5C6E9D0	421183F3	41583EF0	C24CECFE	425B743F
00000025	00000025	451869F0	451869F0	451869F0	451869F0	451869F0	451869F0	C2220000	C21A0000
41600000	41400000	C2683333	42776666	41900000	41F00000	429F3333	427C999A	C2250271	C22998C7
40404040	C4C7E2F4	F8F17BF2	40404040	40404040	40404040	40404040	40404040	40404040	40404040
404040D4	C7E2E34D	F461F8F1	60F25D40	4040D5D6	40C5E7E3	40404040	C6D6D9D4	C1E34DF2	C9F36EF6
C6F1F14E	F45C4040	40404040	40404DF1	F46BFE5D	40C5D7D6	C3C640F1	F5E8F04E	40404040	40404040
0000000E	00000008	00000000	437BC000	4418E333	00000000	C4752333	C37CC28F	434FFD71	433A9B96
C2D93168	4230778D	42480BE3	42127FF3	4155D5D0	C132A5E3	41287D56	C11AA71E	3FA85879	00000000
00000000	00000000	4415E4E3	C37A4D9A	43ED3666	C3E85C29	4330E7D7	43165D37	42410396	C23E2B30
416B7AE1	41A722D1	C13CC6A8	C115161E	3F6EDBEC	C06E72B0	00000000	00000000	00000000	C38517D7
C2C79810	4367F785	434E363D	4318CE19	43105144	4229E25E	411A14E4	C03C63F1	41167AE1	4126DA51
C11C04EA	C0314E3C	40822681	00000000	00000000	00000000	C314E517	4310F204	C2FC3A1D	43340FE7
C31A372F	C24A4FEC	C2EFF6C9	4214E76D	C1AE58E2	C1C1FE16	C159DED3	4127254E	C0268DE9	C0944D01
00000000	00000000	00000000	42D42EE4	C3100B37	42345EEC	C3129D37	42C61C29	C2A1FF3B	4137923A
C1C24C98	C17359B4	4197CB92	C11D3127	4031BDA5	40CEF34D	C022617C	00000000	00000000	00000000
422DDBE1	42960873	C2969AE1	C24DE461	425C5EB4	C23013F1	41DD6E2F	406EECC0	41465C92	C13916F0
4147E426	C0E119CE	408A43FE	40DA3055	00000000	00000000	00000000	C1E99BA6	425D3E02	4246F858
C22B0666	C1227B4A	4211464C	C26B9021	41A48794	41280625	C11078D5	413517C2	C05CAC08	C07B4A23
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