

PROJECT MAGELLAN
SOFTWARE INTERFACE SPECIFICATION
Cover Sheet

NUMBER: MGN-RES-104
REVISION: Original
DATE: 09/15/89

SIS NAME: Mapping Quaternion Polynomial Coefficient (MQPC) File

DOMAIN:

<u>System</u>	<u>Subsystem</u>	<u>Program</u>	<u>Make/Use</u>
MOS	RES	RMSS	Make
MOS	SGS	SEQGEN	USE
MOS	TPS	CDB/MHR	USE
MOS	SDPS	CONTROL	USE (ON EDR)
MOS	IDPS	RCBR	USE (ON EDR)
MOS	MSDS	ATTMON	USE
MOS	DMAS	DIRLOG	USE
MOS	Science	N/A	USE (ON EDR)

Computer System: MicroVax 3300/VAXSTATION 3100

PURPOSE OF INTERFACE (SUMMARY):

This document describes the data that are passed to the Sequence Generation Subsystem (SGS) and other subsystems/users of the Mapping Quaternion Polynomial Coefficients. The interface is between the Radar Engineering Subsystem (RES) and the SGS the Mission Sequence and Design Subsystem (MSDS), and the Telemetry Processing Subsystem (TPS).

INTERFACE MEDIUM:

Disk File: []
Magnetic Tape [] Tracks: Density: Data Code:
Other: [X] SFOC LAN (TPS, SGS, MSDS, DMAS)

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Affected Portions

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All

List of TBD Items

Page(PAR.)

Resolution

Item

NONE

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A-1

APPENDIX B SAMPLE MQPC FILE (for MSDS & TPS)

B-1

SECTION 1
GENERAL DESCRIPTION

1.1 CONTENT OVERVIEW

The Mapping Quaternion Polynomial Coefficients file contains the time scale factor and the polynomial coefficients to an eighth order polynomial function which describes the attitude of the Magellan Spacecraft during mapping.

1.2 SCOPE

The specifications in this document apply to the Mapping Quaternion Polynomial Coefficients file generated by the RES for use by: the SGS for generating the spacecraft command upload, MSDS for monitoring the spacecraft attitude, the DMAS for monitoring mapping coverage of each upload, the TPS for inclusion in the Science-Experiment Data Record (EDR) tapes from which the SAR Data Processing Subsystem (SDPS) will utilize the quaternion data to generate radar image data and the Image Data Processing Subsystem (IDPS) will generate altimetry data products.

1.3 APPLICABLE DOCUMENTS

PD630-300	MOS Design Requirements Document
2-100	Uplink Process, May 1988
3-200	Ground Data System, March 1989
4-130	Radar System Engineering Team, August 1989
4-230	Radar Engineering Subsystem, Draft Rev. Sept. 1989
SIS NAV-136	Average Orbital Elements, January, 1989 (Draft)
SIS SGS-107	Standard Sequence Data File, February 1988
DS32466-402	RMSS Software Requirements Document, October 1988 (Draft revision)
PD630-79	Planetary Constants and Models Document, Rev. C
HS513-034E	MGN Software Management Plan, April 1989
JJPL0006-01-00	JPL Standard Formatted Data Unit (SFDU) Usage and Description, Issue 5, March 7 1988
SFOC-5-SYS-*DU-NJPL	SFOC-SIS NJPL SFDU Global Definitions, 03-16-89

1.4 SUBSYSTEM SITING

1.4.1 Interface Location, Medium

This interface shall be implemented as a disk file element. It will be created on a VAX computer and transferred to the UNISYS 1100. On the UNISYS, it will appear as an element of a program file in UNISYS Standard Data File Format (SDF). The element shall be in ASCII.

1.4.2 Data Source, Destination, and Transfer Method

The MQPC file will be generated by the Radar System Engineering Team (RSET) for each set of mapping passes that is desired. It will be created on the VAX and transferred to the UNISYS via the SFOC Local Area Network or by tape for use by SGS. The MQPC file will also be transferred to the Space Flight Operations Center (SFOC) Central Data Base (CDB) via the SFOC Local Area Network (LAN) using the SFOC supplied File Transfer Protocol (FTP) software. The MSDS and DMAS will obtain the MQPC file from the RSET over the SFOC LAN.

1.4.3 Generation Method and Frequency

The MQPC file shall be generated by the RSET using the Radar Engineering Subsystem's Radar Mapping Sequencing Software (RMSS). It will be generated once for each spacecraft upload. During the mission, the MQPC file must be available on the UNISYS at least 8 hours prior to the generation of the spacecraft command upload by the SGS.

1.4.4 Pertinent Relationships with Other Interfaces

The process of generating the MQPC file will use the Average Orbital Elements file (described in SIS-NAV-136) from the NAVS. The MSDS and DMAS will receive the MQPC file in the same form as the SGS. The TPS will receive the file with a SFDU header.

The MQPC file generated for use by the SGS will conform to SSDF standard as described in SIS-SGS-107.

1.4.5 Labeling and Identification

The file name shall be assigned for external purposes to be consistent with the header records as defined in Section 4.0.

1.5 ASSUMPTIONS AND CONSTRAINTS

The MQPC file for SGS is a Standard Sequence Data File and as such is subject to the format and syntax requirements levied in SIS SGS-107 Standard Sequence Data File. The MQPC file shall be output in the J2000 inertial reference frame.

The quaternion terms described within this document are consistent with the definitions defined in PD630-79, Planetary Constants and Models document, Rev. C, 11 April 1988.

SECTION 2

INTERFACE CHARACTERISTICS

2.1 HARDWARE CHARACTERISTICS AND LIMITATIONS

2.1.1 Special Equipment and Device Interfaces

None.

2.1.2 Special Setup Requirements

None

2.2 VOLUME AND SIZE

The MQPC file that is to be used by the SGS, MSDS, and DMAS will be approximately 2.1K bytes in size. The MQPC file with a SFDU header that will be used by TPS will be approximately 2.5K bytes in size.

2.3 INTERFACE MEDIUM CHARACTERISTICS

The file shall be written as a disk image with one logical record per physical record. It will be transferred from the VAX to the SGS UNISYS via the SFOC LAN. The file can be transferred via a 1600 BPI tape from the VAX to the SGS UNISYS in the event of a failure in the SFOC LAN. The file shall also be transferred to the the CDB using FTP over the SFOC LAN.

2.4 FAILURE PROTECTION, DETECTION, AND RECOVERY FEATURES

2.4.1 File Backup Requirements

File backup and archiving will be handled by the RSET as part of the normal archiving of the upload radar control parameters generation process.

2.4.2 Security/Integrity Measures

These files have no inherent security because they are assumed to be produced by an RSET computer system which maintains its own data integrity checks. Moreover, the textual nature of the file contents makes it editable and thus easily changed. All such changes shall conform to the file structure given in this document.

2.5 END-OF-FILE (OR MEDIUM) CONVENTIONS

End-of-file conventions shall be in accordance with the SDFE UNISYS standard.

SECTION 3

ACCESS

3.1 PROGRAMS USING THE INTERFACE

The SGS receives the MQPC file for generating that portion of the upload command load that will control the attitude of the Magellan spacecraft during the mapping portions of each orbit.

The MSDS will use the MQPC file to help monitor the spacecraft attitude during mapping.

The DMAS will use the MQPC file to track what area of the planet has been mapped by each upload.

The TPS will include the MQPC file on the Science EDR tape. The MQPC file will be used by the SAR Data Processing Subsystem (SDPS) for processing of the SAR data. The Image Data Processing Subsystem (IDPS) will use the MQPC for generating altimetry data products.

3.2 SYNCHRONIZATION CONSIDERATIONS

3.2.1 Timing and Sequencing Characteristics

In the MQPC file, time is scaled by a time scale factor, with scaled time running from -1 (start of mapping) to +1 (end of mapping), with predicted time of periapsis = 0. Hence times should be divided by the scale factor before application to the mapping quaternions coefficients.

3.2.2 Effective Duration

There shall be an upload number and a BEGIN and CUTOFF time in the file header section as described in (see Section 4) which defines the relative time span the MQPC file covers. The quaternions coefficients generated will cover the duration of the upload.

3.2.3 Priority Interrupts

Not applicable.

3.3 INPUT/OUTPUT PROTOCOLS, CALLING SEQUENCES

The file transfer between the VAX computer and the SGS UNISYS computer will be done by the SGS pulling the file over via the SFOC LAN. The OPCT will pull the file over the SFOC LAN using FTP to the CDB where the TPS will retrieve the file for use. The MSDS and DMAS will pull the MQPC file from the RSET over the SFOC LAN.

SECTION 4

DETAILED INTERFACE SPECIFICATIONS

4.1 STRUCTURE AND ORGANIZATION OVERVIEW

The MQPC file shall consist of an ASCII element of a program file. The file shall be organized into a header section and a body section as follows:

	<u>Keyword</u>	<u>Data Content</u>
	\$SMGN	<Descriptive File Name>
	*<acronym>	<Qual*File.Element/Version>
h	*LEVEL	<Level>
e	*PREP	<Preparer's name and extension>
a	*RUNID	<Run ID of job generating file>
d	*PROGRAM	<Program name and version>
e	*CREATION	<Time the file was created>
r	*BEGIN	<Begin time of sequence>
	*CUTOFF	<Cutoff time of sequence>
	*TITLE	<Title of sequence>
	\$SEOH	

body

.
.
.

4.2 STRUCTURE DEFINITION AND FORMAT

4.2.1 Header

The header structure for the MQPC file is detailed in Table 4-1 below. An example of the header is given in Appendix A.

For the MSDS, DMAS, and TPS, an additional header shall be placed at the beginning of the MQPC file. This header will be a SFDU header as defined in the JPL document JJPL00006-00-00 and described in Figure 4-1. An example of the MQPC file with a SFDU header is given in Appendix B.

Table 4-1 MQPC File Header

<u>RECORD</u>	<u>BYTES</u>	<u>DESCRIPTION</u>
1	0 - 4 5 - 11 12 - 58 59 - 60	\$\$MGN = MAGELLAN FILE KEYWORD BLANK MAPPING QUATERNION POLYNOMIAL COEFFICIENTS FILE = DESCRIPTIVE FILE NAME CR, LF
2	0 - 4 5 - 11 12 - 58 59 - 60	*MQPC = FILE ACRONYM KEYWORD BLANK MGN = QUALIFIER MQPC_XXXXXX.OUT = FILE NAME (XXXXXX = STANDARD MGN UPLOAD NAMING CONVENTION) STANDARD UNIVAC FILE NAMING CONVENTION (QUALIFIER*FILENAME) CR, LF
3	0 - 5 6 - 13 12 - 18 19 - 20	*LEVEL = SSDF FILE LEVEL KEYWORD BLANK PA2 = SSDF LEVEL OF MQPC FILE CR, LF
4	0 - 4 5 - 11 12 - ?? ?? - ??	*PREP = FILE PREPARER KEYWORD BLANK GIVES NAME OF FILE PREPARER & PHONE EXTENSION (length depends on length of prepare's name and phone extension) CR, LF (@ end of phone extension)
5	0 - 5 6 - 11 12 - 17 18 - 19	*RUNID = ID KEYWORD BLANK XXXXXX = UPLOAD NUMBER CR, LF
6	0 - 7 8 - 11 12 - 18 19 - 20	*PROGRAM = PROGRAM KEYWORD BLANK PROGRAM AND VERSION # THAT CREATED MQPC FILE CR, LF
7	0 - 8 9 - 11 12 - 30 31 - 32	*CREATION = TIME FILE CREATED KEYWORD BLANK TIME OF FILE CREATION IN UTC YY-DDD/HH:MM:SS.FFF CR, LF

Table 4-1 MQPC File Header --- cont.

8	0 - 5	*BEGIN = START TIME KEYWORD
	8 - 11	BLANK
	12 - 30	BEGINNING TIME LIMIT FOR FILE ALL SUBSEQUENT TIMES IN FILE ARE LATER THAN THIS TIME (UTC FORMAT = YY-DDD/HH:MM:SS.FFF)
	31 - 32	CR, LF
9	0 - 6	*CUTOFF = ENDING TIME KEYWORD
	7 - 11	BLANK
	12 - 30	ENDING TIME LIMIT FOR FILE --- ALL TIMES IN FILE SHALL BE NO LATTER THAN THIS TIME (UTC FORMAT = YY-DDD/HH:MM:SS.FFF)
	31 - 32	CR, LF
10	0 - 5	*TITLE = TITLE KEYWORD
	6 - 11	BLANK
	12 - 58	MAPPING QUATERNION POLYNOMIAL COEFFICIENTS & SCALE FACTOR = TITLE OF FILE
	59 - 60	CR, LF
11	0 - 4	\$\$EOH = END OF HEADER MARKER
	5 - 6	CR, LF

T	CCSD1Z000001		
L	LENGTH L1		
T	NJPL1KOOKLOO		
L	LENGTH L2		
V	UPLOAD_ID=XXXXXX		
A	PROCESS_TIME=YYYY-MM-DDTHH:MM:SS.FFF		
L	DATA_OBJECT_TYPE=QUATERNIONS	L2	L1
U	MISSION_ID=4		
E	SPACECRAFT_NAME=MAGELLAN		
	DATA_SET_NAME=MQXXXXXX.OUT		
	MISSION_NAME=MAGELLAN		
	SPACECRAFT_ID=18		
T	CCSD1R000003		
L	LENGTH L3		
V	DELIMITER=SMARKER		
A	PRODUCT_NAME=MQXXXXXX.OUT		
L	TYPE=NJPL1I000127	L3	
E	PROTOCOL=NONE		
Q U A T E R N I O N S D A T A (See Section 4.2.1 & 4.2.2)			
T	CCSD1R000003		
L	LENGTH L4		
V	DELIMITER=EMARKER		
L	PRODUCT_NAME=MQXXXXXX.OUT	L4	

Figure 4-1 SFDU-Mapping Quaternion Polynomial Coefficients File Structure

<u>BYTES</u>	<u>CONTENTS</u>
00-11	CCSDS SFDU Label (12 bytes)
12-19	Length Field L1 = length of Keyword Header & SMARKER Header (8 bytes)
20-31	NJPL Control Authority ID for Keyword Header (12 bytes)
32-39	Length Field L2 = length of Keyword value data (8 bytes)
40-55	Upload ID = Upload Number the Processed Bandwidth file data covers (XXXXXX = Magellan Upload Number convention where the first X = type of upload (C = cruise, I = IOC, M = Mapping, T = test the 2nd - 5th X = 4 digit upload number the 6th X = Revision Letter (A,B, ... Z) (16 bytes)
56-57	Carriage Return, Line Feed (CR, LF)
58-93	PROCESS_TIME = creation time of the MQPC file in UTC (YYYY-MM-DDTHH:MM:SS.FFF) (36 bytes)
94-95	CR, LF
96-123	DATA_OBJECT_TYPE = Unique keyword id name to identify the Mapping Quaternion Polynomial Coefficients file (28 bytes)
124-125	CR, LF
126-137	MISSION_ID = Designated DSN Mission Number for Magellan = 4 (12 bytes)
138-139	CR, LF
140-163	SPACECRAFT_NAME = Magellan (24 bytes)
164-165	CR, LF
166-191	DATA_SET_NAME = Unique id name to identify upload quaternions are valid for. XXXXXX = upload number per Magellan standard (26 bytes)
192-193	CR, LF
194-214	MISSION_NAME = Magellan (21 bytes)

Figure 4-1 SFDU-Mapping Quaternion Polynomial Coefficients File Structure --- cont.

<u>BYTES</u>	<u>CONTENTS</u>
215-216	CR, LF
217-232	SPACECRAFT_ID = designated DSN Spacecraft Number for Magellan = 18 (16 bytes)
233-234	CR, LF
235-246	Type Label Aggregation start (12 bytes)
247-254	Length Field L3=length of value field (8 bytes)
255-271	DELIMITER = SMARKER start marker, indicates that a collection of data structures follow the value field of this label (17 bytes)
272-273	CR, LF
274-298	PRODUCT_NAME = id this collection by a unique name, where XXXXXX=the upload number (25 bytes)
299-300	CR, LF
301-317	TYPE - identifies the 12 byte type field assigned to data structure (17 bytes)
318-319	CR, LF
320-332	Protocol id = NONE (13 bytes)
333-334	CR, LF
335-eod (end-of-data)	Mapping Quaternion Polynomial Coefficients File data
eod+1-eod+2	CR, LF
eod+3-eod+14	Fixed NJPL1 Control Authority ID for End Marker Header (12 bytes) (End Marker for end of data)
eod+15-eod+22	Length L4 = length of EMARKER Header (8 bytes)
eod+23-eod+39	End of data Marker (= EMARKER) (17 bytes)
eod+40-eod+41	CR, LF
eod+42-eod+66	PRODUCT_NAME = unique id identifying this collection of data, where XXXXXX = the upload number. (25 bytes)
eod+67-eod+68	CR, LF

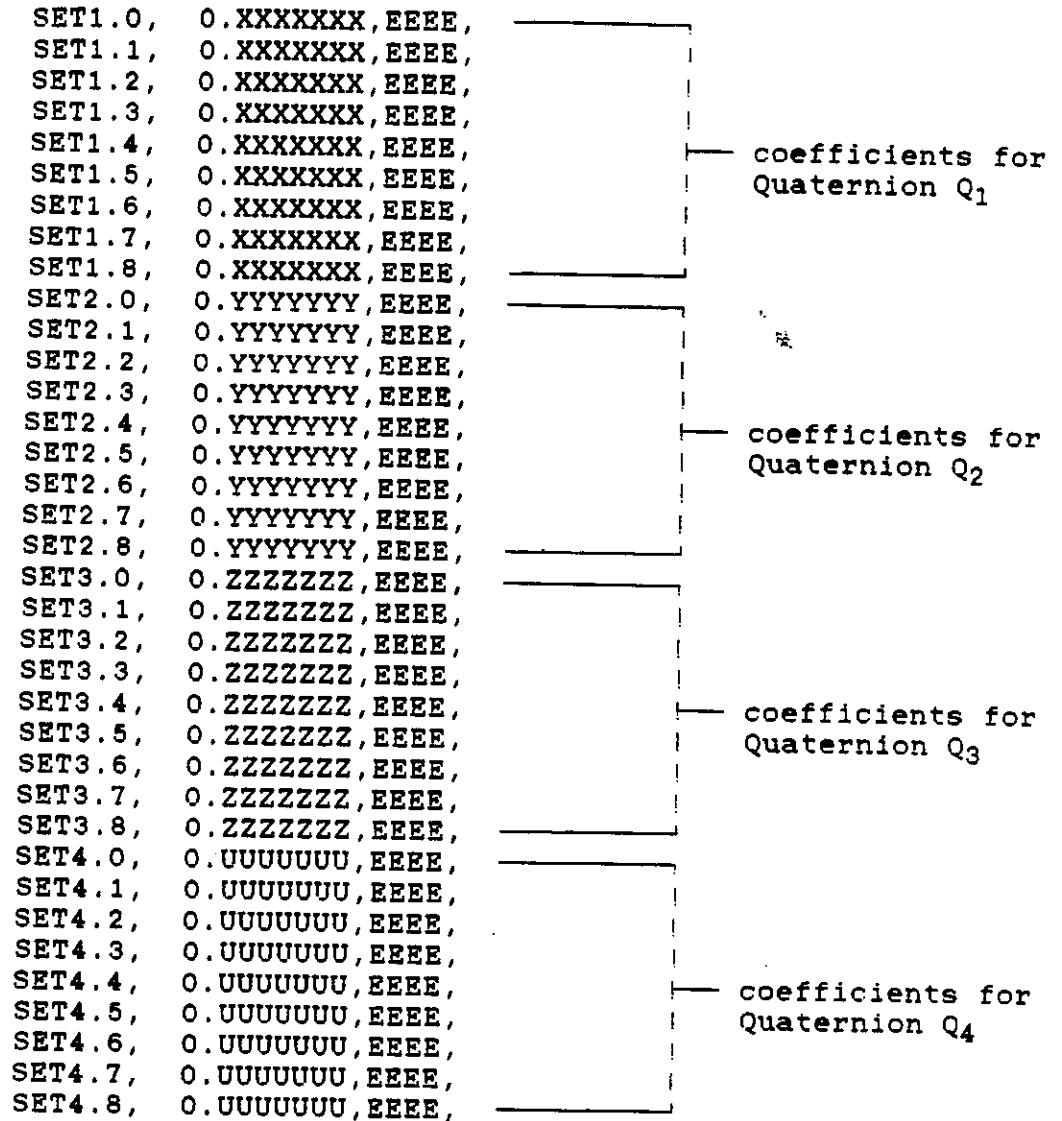
Figure 4-1 SFDU-Mapping Quaternion Polynomial Coefficients File Structure --- cont.

4.2.2 Body

The body of the MQPC file will consist of four groups of data (corresponding to the 4 mapping quaternions). Figure 4-2 describes the content of the four groups. An example of the file for SGS is given in Appendix A. An example of the file for MSDS and TPS is given in Appendix B.

Note that the quaternion coefficient values are real numbers split into a mantissa parameter value and a corresponding exponent parameter value.

PA2, MAPPLYPRM, 153A, , YY-DDD/HH:MM:SS.FFF,
 UPCEFFLAG, TRUE,



TSF, SSSS.FFF;
 \$\$EOF

where

XXXXXXX, YYYYYYY,
 ZZZZZZZ, UUUUUUU = mantissa values

EEEE = exponent values

Figure 4-2. MQPC File Body Structure

Figure 4-2. MQPC File Body Structure--- cont.

<u>RECORD</u>	<u>BYTES</u>	<u>DESCRIPTION</u>
1	0 - 2	PA2 = PARAMETER SET LEVEL
	3	COMMA
	4 - 12	MAPPLYPRM = PARAMETER SET NAME
	13	COMMA
	14 - 17	153A = UNIQUE ID FOR MAPPING QUATERNION POLYNOMIAL COEFFICIENTS
	18	COMMA
	19	COMMA
	20 - 38	BEGIN TIME (SAME AS BEGEN TIME IN HEADER)
	39	COMMA
	40 - 41	Carriage Return, Line Feed (CR, LF)
2	0 - 9	UPCOEFFLAG = UPDATE MAPPING QUATERNIONS FLAG PARAMETER NAME
	10	COMMA
	11 - 14	FLAG always set to TRUE
	15	COMMA
	16 - 17	CR, LF
3-38	0 - 15	BLANK
	16 - 21	SETI.J = COEFFICIENT ID where I = 1,2,3,4 (corresponding to quaternions Q ₁ , Q ₂ , Q ₃ , & Q ₄), J = 0, 1, 2, ..., 8 (corresponding coefficient index)
	22	COMMA
	23 - 33	MANTISSA VALUE FOR J-th COEFFICIENT VALUE FOR QUATERNION I
	34	COMMA
	35 - 38	EXPONENT VALUE FOR J-th COEFFICIENT VALUE FOR QUATERNION I
	39	COMMA
		Note: 1. Both mantissa and coefficients are signed and are right justified within each field.
		2. J=0 should be multiplied with t ⁰ , J=1 should be multiplied with t ¹ , J=8 should be multiplied with t ⁸ .
	40 - 41	CR, LF

Figure 4-2. MQPC File Body Structure--- cont.

39	0 - 2	TSF = TIME SCALE FACTOR PARAMETER NAME
	3	COMMA
	4	BLANK
	5 - 12	SSSS.FFF = TIME SCALE FACTOR VALUE (in seconds and fractions of seconds) SEQGEN converts this to STM = (1/TSF)* (sec/clock cycle). The TSF will take into account the total time the spacecraft is required to trace out the mapping attitude profile. The Spacecraft Engineering Team will provide the necessary data on the time needed by the spacecraft to trace out the mapping attitude profile. This scale factor will scale time from periapsis to run from -1 to +1 with predicted time of periapsis equal to 0. (Right justified field).
	13	Semi-colon
	14 - 15	CR, LF
40	0 - 4	S\$EOF = END OF FILE MARKER
	5 - 6	CR, LF

APPENDIX A
SAMPLE MQPC FILE

\$\$MGN MAPPING QUATERNION POLYNOMIAL COEFFICIENTS FILE
 *MQPC MGN*MQPC_M0002A.OUT
 *LEVEL PA2
 *PREP F. MAGELLAN , x1234
 *RUNID M0002A
 *PROGRAM RMSS
 *CREATION 88-081/13:45:48.000
 *BEGIN 91-001/15:51:12.000
 *CUTOFF 91-006/11:38:00.000
 *TITLE MAPPING QUATERNION POLYNOMIAL COEFFICIENTS & SCALE FACTOR
 \$\$EOH

PA2,MAPPLYPRM,153A,,91-001/15:51:12.000,
 UPCOEFFLAG,TRUE,

SET1.0,	0.7330383,	0,
SET1.1,	-0.4427131,	0,
SET1.2,	-0.2289293,	0,
SET1.3,	-0.9446220,	-1,
SET1.4,	0.1564624,	0,
SET1.5,	0.3014160,	0,
SET1.6,	-0.1987941,	0,
SET1.7,	-0.1590305,	0,
SET1.8,	0.1026197,	0,
SET2.0,	-0.1549295,	-1,
SET2.1,	-0.1901418,	0,
SET2.2,	0.6462808,	0,
SET2.3,	-0.7933342,	-1,
SET2.4,	-0.1568259,	1,
SET2.5,	0.3242564,	0,
SET2.6,	0.1751690,	1,
SET2.7,	-0.1769548,	0,
SET2.8,	-0.7052533,	0,
SET3.0,	-0.1359040,	0,
SET3.1,	0.4653614,	0,
SET3.2,	0.5590689,	0,
SET3.3,	-0.1042830,	1,
SET3.4,	-0.7248137,	0,
SET3.5,	0.1418364,	1,
SET3.6,	0.3243825,	0,
SET3.7,	-0.6552103,	0,
SET3.8,	0.0000000,	0,
SET4.0,	0.6666295,	0,
SET4.1,	0.5617887,	0,
SET4.2,	-0.2123092,	0,
SET4.3,	-0.3418831,	-1,
SET4.4,	-0.1163322,	0,
SET4.5,	-0.1486579,	0,
SET4.6,	0.3375760,	0,
SET4.7,	0.8709243,	-1,
SET4.8,	-0.1787577,	0,

TSF, 1279.267;
 \$\$EOF

APPENDIX B

SAMPLE MQPC FILE WITH SFDU HEADERS

```

CCSD1Z00000100000315NJPL1KOOKL0000000195UPLOAD_ID=M0002A
PROCESS_TIME=1988-03-21T13:45:49.000
DATA_OBJECT_TYPE=QUATERNIONS
MISSION_ID=4
SPACECRAFT_NAME=MAGELLAN
DATA_SET_NAME=MQM0002A.OUT
MISSION_NAME=MAGELLAN
SPACECRAFT_ID=18
CCSD1R00000300000080DELIMITER=SMARKER
PRODUCT_NAME=MQM0002A.OUT
TYPE=NJPL1I000127
PROTOCOL=NONE
$SMGN      MAPPING QUATERNION POLYNOMIAL COEFFICIENTS FILE
*MQPC      MGN*MQPC_M0002A.OUT
*LEVEL     PA2
*PREP      F. MAGELLAN      , x1234
*RUNID     M0002A
*PROGRAM   RMSS
*CREATION  88-081/13:45:48.000
*BEGIN     91-001/15:51:12.000
*CUTOFF    91-006/11:38:00.000
*TITLE     MAPPING QUATERNION POLYNOMIAL COEFFICIENTS & SCALE FACTOR
$$EOH
PA2,MAPPLYPRM,153A,,91-001/15:51:12.000,
UPCOEFFLAG,TRUE,
      SET1.0,  0.7330383,  0,
      SET1.1, -0.4427131,  0,
      SET1.2, -0.2289293,  0,
      SET1.3, -0.9446220, -1,
      SET1.4,  0.1564624,  0,
      SET1.5,  0.3014160,  0,
      SET1.6, -0.1987941,  0,
      SET1.7, -0.1590305,  0,
      SET1.8,  0.1026197,  0,
      SET2.0, -0.1549295, -1,
      SET2.1, -0.1901418,  0,
      SET2.2,  0.6462808,  0,
      SET2.3, -0.7933342, -1,
      SET2.4, -0.1568259,  1,
      SET2.5,  0.3242564,  0,
      SET2.6,  0.1751690,  1,
      SET2.7, -0.1769548,  0,
      SET2.8, -0.7052533,  0,
      SET3.0, -0.1359040,  0,
      SET3.1,  0.4653614,  0,
      SET3.2,  0.5590689,  0,
      SET3.3, -0.1042830,  1,
      SET3.4, -0.7248137,  0,
      SET3.5,  0.1418364,  1,
      SET3.6,  0.3243825,  0,

```

SET3.7,	-0.6552103,	0,
SET3.8,	0.0000000,	0,
SET4.0,	0.6666295,	0,
SET4.1,	0.5617887,	0,
SET4.2,	-0.2123092,	0,
SET4.3,	-0.3418831,	-1,
SET4.4,	-0.1163322,	0,
SET4.5,	-0.1486579,	0,
SET4.6,	0.3375760,	0,
SET4.7,	0.8709243,	-1,
SET4.8,	-0.1787577,	0,

TSF, 1279.267;

\$SEOF

CCSD1R00000300000046DELIMITER=EMARKER
PRODUCT_NAME=MQM0002A.OUT