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4.3 EXAMPLE SPACECRAFT EVENT FILE

PROJECT GALILEO	**NUMBER:** 625-610: 211-05 P2
SOFTWARE INTERFACE SPECIFICATION	**REVISION:** Rev. A Phase 2
Cover Sheet	**DATE:** 06/07/94

SIS NAME: Spacecraft Event File (SEF)

DOMAIN:

System	Subsystem	Program	Make/Use
MSS	Sequence Generation	SEQGEN	Make
MSS	Sequence of Events Gen	SEG	Use
MSS	Scan Platform Modeling	SCANOPS	Use
MSS	Command Generation	SEQTRAN	Use
SVC	Science VAX Cluster	C-Kernel	Use
	SNIPGEN	SNIPGEN	Use
OES	G&C Analysis	GCFS	Use
OES	Power Analysis	RSEF	Use
NAV	OMAS	OMAS	Use
DMS	Utilities	AQQC/SCEGEN	Use

Computer System: Unisys 2200, Varian

PURPOSE OF INTERFACE (SUMMARY): This interface provides a people-oriented form of sequence data at the individual event (i.e. command) level intended for use in the mission operations environment. The format for the following interface is fully defined by SIS 211-59, Ground Event File.

INTERFACE MEDIUM:
Disk File: [X]
Magnetic Tape: [ ] Tracks: _____ Density: _____ Data Code: _____
Other: [ ]:

SIS COORDINATOR: A. Amador

SIGNATURES:

Approval Position	Name		Date
Ground S/W System Engineer	W. Sible	_____	_____

Concurrence:

System: Program	Position	Name		Date
MSS:	SYS E	A. Amador	_____	_____
SEQGEN	COG E	V. Wang	_____	_____
SEQGEN	COG P	J. Dale	_____	_____
SEG	COG E	E. Erwin	_____	_____
SEG	COG P	K. Miller	_____	_____
SCANOPS	COG E/COG P	S. Javidnia	_____	_____
SEQTRAN	COG E/COG P	T. Loesch	_____	_____
MCHS	COG E/COG P	C. Sagoian	_____	_____
SVC:	SYS E	J. Anderson	_____	_____
C-Kernel	COG E	K. Deutsch	_____	_____
	COG P	N. Bachman	_____	_____
SNIPGEN	COG E/P	K. Deutsch	_____	_____

OES:	SYS	E	J. Hofman	_____	_____
RSEF	COG	E/COG P	B. Rein	_____	_____
NAV:	SYS	E	J. Ekelund	_____	_____
OMAS	COG	E	R. P. Davis	_____	_____
OMAS	COG	P	W.M. Owen	_____	_____
DMS:	SYS	E	C. Hidalgo	_____	_____
AQQC	COG	E/COG P	T. Specht	_____	_____
SCEGEN	COG	E/COG P	J. Schmidling	_____	_____

Custodian: V. Wang

625-610

PROJECT GALILEO

SOFTWARE INTERFACE SPECIFICATION

S/C Event File (SEF)

SIS #211-05 P2

June 07, 1994

ABSTRACT: This SIS describes the form and syntax of each S/C Event File (SEF) which is a product of the Mission Sequence System (MSS). Each SEF will contain a header that identifies and describes the scope of the file, plus a body which provides a time ordered list of events occuring in a particular sequence.

CHANGE CONTROL: The Galileo change control procedures specified in STAP 2.17 apply to this document.

Jet Propulsion Laboratory
California Institute of Technology

JPL D-296

DOCUMENT CHANGE LOG

Change	Date	Affected Portions
Original	07/24/81	All
Change 1	05/17/83	Indicated by change bars
Original Phase 2 Build C	2/5/85	All
Change 1	07/10/85	Indicated by change bars per SCR 749
Change 2	02/19/86	Indicated by change bars per SCR 693
Change 3	09/10/86	Indicated by change bars per SCR 919
Change 4	06/03/87	Indicated by change bars per SCR A298
Change 5	09/01/88	Indicated by change bars per SCRs 715A,881, A361 and A583
Change 6	1/09/89	Indicated by change bars per SCR A764
Rev. A, Phase 2	06/07/94	Indicated by change bars per SCR B400

List of TBD Items

Page	Resolution Date	Item
None		

SECTION 1

GENERAL DESCRIPTION

1.1 CONTENT OVERVIEW

This Software Interface Specification (SIS) provides a people-oriented form and syntax for displaying sequence data within the Mission Operation System (MOS) environment. The header section identifies the type of file, its creation date, scope and genealogical ancestry. The body section lists sequence components, special subsystem status summaries and other events.

1.2 SCOPE

The format and syntax specifications in this document apply to all phases of the Galileo Mission.

1.3 APPLICABLE DOCUMENTS

625-640-211031	SEQGEN SRD
625-645-211031	SEQuence GENeration User's Guide
MOS-GLL-4-211	Functional Requirement, Galileo Mission Sequence System
625-640-211061	MCHS SRD
625-640-211101	SEG SRD
SIS 211-13	Standard Sequence Data File (SSDF)
625-540	Sequence Component Definition Document
Volume 2:	Profile Activity Catalog
Volume 3:	Block Dictionary
625-675-211031	Algorithm Dictionary
GLL-3-290	Command Structure and Assignments
MCCC1843-1	LIB*CLIB$ Special Feature Library, Sections 3.1 - 3.3
UP 4144.31	Sperry Univac 1100 Series Executive, Volume 3, Section 11.2.3, System Data Formats

UP 8478 Sperry Univac 1100 Series Processor Common Input/Output System (PCIOS), Section 5.2, System Data Format

1.4 SUBSYSTEM SITING

1.4.1 Interface Location, Medium

This interface shall be implemented in an ASCII element of a program file in Univac Standard Data File Format (SDFF). It will be in human-readable form and printouts will be generated.

1.4.2 Data Source, Destinations and Transfer Method

The S/C Event File (SEF) is generated by the CHECKER processor of the SEQGEN Program. It is read by the MCHS-SETUP Program (in SEQTRAN) which generates "PREDICTS" for sequences simulated in the MCHS. It is also read by SEG in order to create a Sequence Of Events (SOE). SNIP reads the SEF to obtain SSI shutter time and PWS event time, NIMS OBSTAB reads the SEF to obtain NIMS events, and, SNIP, OBSTAB and DMT AQQC all read the SEF for playback process predicts. C-KERNEL reads SCANOPS Predicts file. The SEF is read by E-Kernel generation software (name TBD), which is operated by GLL SDT.

1.4.3 Pertinent Relationships with Other Interfaces

N/A

1.4.4 Labeling and Identification (Internal/External)

The original file name will be written into the header in the form:

Qualifier*File.Element/Version

SECTION 2

INTERFACE CHARACTERISTICS

2.1 HARDWARE CHARACTERISTICS

2.1.1 Special Equipment and Device Interfaces

None.

2.1.2 Special Setup Requirements

None.

2.2 VOLUME AND SIZE

Each SEF shall be limited to 10000 parameter sets. A parameter set contains all the data necessary to invoke a given sequence component.

Parameter sets shall conform to the requirements of the Standard Sequence Data File, see SIS 211-13.

There shall be no more than 15 EPOCH header records (see 4.2-1).

2.3 INTERFACE MEDIUM CHARACTERISTICS

The file shall be written in Univac Standard Data File Format (SDFF). This is the format described in the Univac Executive manual and used by Univac Fortran V, Athena Fortran and LIB*CLIB$ routines ELT READ and ELT WRITE. It is <u>not</u> the format described in the Univac PCIOS manual and used by Univac FTN and PL/1.

2.4 FAILURE PROTECTION, DETECTION AND RECOVERY FEATURES

2.4.1 File Backup Requirements

This is handled by the individual software systems, e.g. the MSS ARCHIVE subsystem.

2.4.2 Security/Integrity Measures

These files have no inherent security because they are directly text editable using system routines.

2.5 END-OF-FILE (OR MEDIUM) CONVENTIONS

End-of-File conventions shall be in accordance with Univac Standard Data File Format (SDFF).

SECTION 3

ACCESS

3.1 PROGRAMS USING THE INTERFACE

It is required for SEQTRAN, SCANOPS and SEG to access this file.

3.2 SYNCHRONIZATION CONSIDERATIONS

3.2.1 Timing and Sequencing Characteristics.

There shall be a BEGIN and a CUTOFF time in the header section. Each event in the body of the file shall have a time which falls in between BEGIN and CUTOFF.

In this document "time" refers to Spacecraft Event Time, which is Universal Time (UT, also referred to as GMT) of execution on the spacecraft bus. Unless otherwise specified, "time" is expressed in the form "yy-ddd/hh:mm:ss.fff, i.e. years, days of year, hours, minutes, seconds and fractions of a second.

Within the body of the file the events shall be arranged in time order.

3.2.2 Effective Duration

The effective duration is the difference between the BEGIN and the CUTOFF times of the header section.

3.2.3 Priority Interrupts

N/A

3.3 INPUT/OUTPUT PROTOCOLS, CALLING SEQUENCES

N/A

SECTION 4

DETAILED INTERFACE SPECIFICATIONS

4.1 STRUCTURE AND ORGANIZATION OVERVIEW

The SEF file shall consist of an ASCII element of a program file. There will be exactly one file per element. The element shall consist of 132- character images. The file shall be organized into a header section and a body section as follows:

	Keyword	Data Content
	# $$GLL	SPACECRAFT EVENT FILE
	# *<Acronym>	<Qual*File.Element/Version>
	# *LEVEL	<Level>
	# *PREP	<Preparer's name and extension>
	# *RUNID	<Run ID of job generating file>
	# *PROGRAM	<Program name and version>
	# *CREATION	<Time the file was created>
	# *BEGIN	<Begin time of sequence>
	# *EPOCH	<EPOCH name>, <EPOCH time>
	# .	
	# .	
	# .	
Header	# *CUTOFF	<Cutoff time of sequence>
Section	# *TITLE	<Title of sequence>
	# *<Acronym>	<Q*F.E/V of file used by program
	#	generating this file>
	# *<Acronym>	<Q*F.E/V of ancestor file not
	#	directly used by program
	#	using this file>
	# .	
	# .	
	# .	
	# $$EOH	
	# Combinations of:	
	# Sequence Components	
Body	# Subsystem Status Summaries	
Section	# Other events	
	# .	

The Header Data content begins in column 13.

4.2 SUBSTRUCTURE DEFINITION AND FORMAT

4.2.1 Header

The descriptive name on the $$GLL record shall be "S/C EVENT FILE".

The remainder of the header shall conform to the Standard Sequence Data File conventions specified in section 4.2.1 of SIS 211-13.

4.2.2 Body

The body of the SEF file shall consist of event lines and continuation lines of up to 132 characters in length.

Event lines shall have a full Spacecraft CLocK (SCLK) time in decimal, followed by SpaceCraft Event Time (SCET), followed by event content in the following format:

Columns	Content
1 - 8	Major frame count
9	":"
10, 11	Minor frame count
12	":"
13	Real Time Interrupt (RTI)
14	Blank
15, 16	Year
17	"-"
18-20	Day of year
21	"/"

22-33	hh:mm:ss.fff (hours, minutes, seconds and fractions of seconds)
34	Blank
35-131 +	Event content

Continuations:

Continuation lines shall have columns 1 - 34 blank. Any number of continuation lines may follow an event line.

Event content starting in column 35, shall consist of one of the following:

a) A verbatim copy of a parameter set (see 211-13), followed by
' << ' title-of-parameter-set ' >> ', optionally followed by state-change-list, ';' .

There are always two semicolons: one at the end of the parameter set and one after everything else. The state-change-list is made up of state-changes separated by commas. A state-change is free form, except that it may not contain a comma or semi-colon.

State-changes are generated by SEQGEN Event Logic when some parameter set causes the value of a node having an SEF trigger to change value.

b) A Status-Event, consisting of a status-event-name ':', followed by a status-item-list ';' .

The status-item-list is made up of status-items, separated by commas. A status-item can be defined to have both fixed and variable content. An '*' before one of the variable parts shall indicate that it is a changed value.

The status-events that appear in the SEF shall be defined in this SIS document. In these definitions undefined columns shall be blank and strings shall be left justified.

As a rule, all status-events will appear at the start and end of the SEF, and when some value in a status-event changes.

c) A Comment, consisting of a ';' in column 35, followed by free form text.

d) A Status-Comment, consisting of ';' '<' state-description '>', followed in column 70 by the command that produces that state.

These commands can be continued in column 70 of a continuation line, but shall not exceed 80 characters in length or 20 fields, including the five standard parameters (Level, Name, ID, Prcsr, Time).

Status-comments are generated by SEQGEN (CHECKER) at the BEGIN and CUTOFF times of the sequence, and as instructed by the use of the SEQGEN *SCSTATE,E instruction. The selection of status-comments to be generated is specified in the S/C Status Criteria File (SCSC). See SEQGEN User's Guide section 4.2.

4.2.2.1 DMS Status Event. This event shall be generated each start and finish of a runup, rundown or reversal and any other 6DMSC/6DMSR commands.

Columns	Content
1-34	Times, see 4.2.2
35-38	"DMS:" Status Event Name
40	"*" if following is a change since last report
41-48	Choice of: "RUNUP," "RECORD," "RUNDOWN," "READY," "REWIND," "PLAYBACK," "SLEW," “SLEW-TIC,” “REVERSE,” “AUTOSTOP,” “RUNNING,” ”RESUME,”
51-54	Choice of: "RDY," "P7," "R7," "R28," "R115," "R403," "R806," "S7," "S28," "S115," "S403," "S806,"
57-61	"TRACK"
63	"*" if following is a change since last report
64	Choice of "0" "1" "2" "3" "4"
65	","
67	"*" if following is a change since last report

68-70	"FWD," or "REV,"
73-75	"TIC"
77	"*" if following is a change since last report
78-84	Tape Increment Count (TIC) in the format of NNNN.NN
86-88	"+/-"
91-96	Uncertainty TICs in the format of NNN.NN
97	";"

The DMS continuation line will show if there is any change in the DMS status event:

Continuation Line:

35-43	“DMS USED:”
45-52	Start stop cycles, real number with 1 decimal place (Format NNNNNN.N)
54-71	“START STOP CYCLES,”
73-76	Tape passes, integer (up to 4 digits)
78-89	“TAPE PASSES,”
91-97	Tracks of tape across the heads, real number with 2 decimal places (Format NNNN.NN)
99-129	“TRACKS OF TAPE ACROSS THE HEADS”
130	‘,’

Continuation Line:

35-40	Negator spring cycles, real number with 1 decimal place (Format NNNN.N)
42-62	“NEGATOR SPRING CYCLES”
63	“;”

4.2.2.2 TVSHUT Status Event. This event shall be in Post Expansion checks each time a shutter opens or for a 36IP command with an exposure of 29.

Columns	Content
1-34	Times, see 4.2.2
35-41	"TVSHUT:" Status Event Name
43-46	"FILT"
48	Choice of "0" thru "7" Filter Number modeled in response to the 36IP command
50-52	Filter Name corresponding to the Filter Number: 0-CLR, 1-GRN, 2-RED, 3-VLT, 4-NIR, 5-1MC, 6-MT1, 7-MT2
53	","
55-57	"EXP"
59-60	Choice of " 0" thru "31" Exposure Number in response to the 36IP command, right justified.
61	","
63-66	"GAIN"
68	"*" if following is a change since last report
69	Choice of "1" thru "4"
70	","
72-75	"XTND"
77	"0" "1" "2" Extension code
78	","

80-82	"TLM" Telemetry
84	"*" if following is a change since last report
85-90	Left justified 6TMREC command parameter (23 values defined)
91	","
93-99	"PICOUNT" Cumulative picture count
101-106	Six digit integer
107	"," Picture Number
109-113	"PICNO" Picture identification number
115-116	Orbit number, numeric
117	Target designation
118-121	Frame No. (SSICNTRL will generate consecutive frame numbers for consecutive shutters.)
122	","

TVSHUT
Continuation Line:

42-47	“FL/ERS” FLOOD/ERASE
49	“*” If following is a change since last report
50-52	Choice of “ENA" “DIS”
53	“,”
55-59	“RDOUT” READ OUT
61	“*” If following is a change since last report

62-64	Choice of “ENA” “DIS”
65	“;”

4.2.2.3 SSIMODE Status Event. This event shall be generated for each 36IM command. Note: The last field RFMT (RECORD FORMAT) in the SSI Mode Status Event is derived from 3 params (The Imaging Rate, OP mode and Compressor Mode) of the 36IM CMD. If the 3 params are not coherent, the RFMT will show a “???”.

Columns	Content
1-34	TIMES, See 4.2.2
35-42	“SSIMODE:” Status Event Name
44-55	"IMAGING RATE"
57	"*" if following is a change since last report
58-62	Choice of “LOW” “INTER” “HIGH” “RAD” “FAST”
63	","
65-74	"COMPRESSOR"
76	"*" if following is a change since last report
77-79	Choice of "ON" or "OFF"
80	","
82-90	"COMP MODE" Compression mode
92	"*" if following is a change since last report
93-102	Choice of "INFO PRES" or "RATE CNTRL"
103	","

105-115	"LIGHT FLOOD"
117	"*" if following is a change since last report
118-120	Choice of "ON" or "OFF"
121	","

SSIMode
Continuation Line:

42-46	“RDOUT” Read Out
48	“*” If following is a change since last report
49-52	Choice of “CONT” or “SAMP”
53	“,”
55-58	“MODE”
60	“*" If following is a change since last report
61-63	Choice of “LGA” or “HGA”
64	“,"
66-69	“RFMT” Record Format
71	“*” If following is a change since last report.
72-74	Choice of “HIM” “HMA” “IM8" “HCA” “IM4" “HIS” “AI8" “???”
75	“;”

4.2.2.4 RFS Status Event This event is affected by the following commands: 2E, 2ER, 2LGA1, 2LGA2, 2KP, 2KPR, 2KS, 2KSR, 2N, 2D, 2H, 2DHR, 2T, 3TLM, 2A, 2ANPTR, 2P,42AP, 42APR, 42AS, 42ASR, 2GP, 2GPR, 2GS and 2GSR. This event shall also be generated at 12 hours before the cutoff time, in addition to the occasions described in 4.2.2b.

Columns	Content
1-34	Times, see 4.2.2
35-38	"RFS:" Status-Event Name
40	"*" if following is a change since last report
41-43	"LG1", "LG2", or "HGA"
44	","
46-49	"STWT" S-Band Travelling Wave Tube
50	"*" if following is a change since last report
51-54	One of "OFF" "LOW" "HIGH" Power
55	","
57-59	"SMI" S-Band Modulation Index
60	"*" if following is a change since last report
61-62	Numerical value of modulation index from 3TLM command, right justified.
63	","
65-68	"XTWT" X-Band Travelling Wave Tube
69	"*" if following is a change since last report
70-73	One of "OFF" "LOW" "HIGH" Power
74	","

76-78	"XMI" X-Band Modulation Index
79	"*" if following is a change since last report
80-81	Numerical value of modulation index from 3TLM command, right justified.
82	","
84-87	"SRNG" S-Band Ranging
88	"*" if following is a change since last report
89-91	"ON" or "OFF"
92	","
94-97	"XRNG" X-Band Ranging
98	"*" if following is a change since last report
99-101	"ON" or "OFF"
102	","
104-106	"DOR" Delta Oneway Ranging
107	"*" if following is a change since last report
108-110	"ON" or "OFF"
111	","
113-116	"TWNC" Two Way Non Coherent mode
117	"*" if following is a change since last report
118-120	"ON" or "OFF"
121	","

123-126	"XSDC" X to S Down Converter
127	"*" if following is a change since last report
128-130	"ON" or "OFF"
131	";"

4.2.2.5 MDS Status-Event. The SEG Program will use the information from this status-event plus that from 4.2.2.4 to create several DSN SOE keywords.

Columns	Content
1-34	Times, see 4.2.2
35-38	"MDS:" Status-Event Name
40-42	"FMT" Telemetry Format
43	"*" if following is a change since last report
44-46	Any real-time (i.e. down link) telemetry format that can be in the first three characters of the 6th parameter of the 6TMSED command (e.g.,"BL3"). The most recently specified value shall be used. In addition 'ESS' will be printed when 40 b/s coded or 40 b/s uncoded data has been selected via the 3TLM or 6CS commands.
47	","
49-52	"SBIT" S-Band Bit Rate
53	"*" if following is a change since last report
54-59	One of " 0", " 10", " 40 CD", " 40 UC", " 1200", " 7680", " 28800", " 67200", " 80640", "115200", "134400"
60	","
62-66	"STYPE" S-Band Data Type
67	"*" if following is a change since last report

68-73	One of "HIFHIR", "HIFLOR", "LOFHIR", "LOFLOR" the SUB-CARR parameter of the 3TLM command, left justified, specified together with a value of "S" for the BAND parameter.
74	","
76-79	"SDRV" S-Band Driver
80	"*" if following is a change since last report
81-83	One of "OFF", "1", "2", "BTH". This consists of all after the first three characters ("DRV") of the DRIVER parameter of the 3TLM command specified together with a value of "S" for the BAND parameter.
84	","
86-89	"SEXC" S-Band Exciter
90	"*" if following is a change since last report
91-93	"ON" or "OFF"
94	","
96-99	"XBIT" X-Band Bit Rate
100	"*" if following is a change since last report
101-106	One of " 0", " 10", " 40 CD", " 1200", " 7680"," 28800", " 80640", "115200", "134400"
107	","
109-113	"XTYPE" X-Band Data Type
114	"*" if following is a change since last report
115-120	Value of SUB-CARR parameter of 3TLM command specified together with value of "X" for the BAND parameter.

121	","
123-126	"XDRV" X-Band Driver
127	"*" if following is a change since last report
128-130	One of "OFF" "1" "2" "BTH". This consists of all after the first three characters of the DRIVER parameter of the 3TLM command specified together with a value of “X” for the BAND parameter.
131	","

MDS
Continuation Line

42-47	“RTFILL” R/T Fill
48	“*”
49-53	Choice of “FILL,” “NORM”
55-62	“DLKCAP_S” D/L capability s-band
63	“*”
64-66	“0,” “8,” “10,” “20,” “32,” “40,” “60,” "80", "120," “160,”
69-76	“DLKCAP_X” D/L Capability x-band
77	“*”
78-80	“0,” “8”, “10,” “20,” “32,” “40,” “60,” “80,” “120,” “160,”
81	“;”

4.2.2.6 AACS Status Event. This event is affected by the following commands: 7MODE 7SRDB 7PTDB 7SUN 7BIGZ 7NEGZ 7TURN 7BURN. Prior to expansion the 7MODE command will normally be encountered.

Columns	Content
1-34	Times, see 4.2.2
35-39	"AACS:" Status-Event Name
41-44	"MODE"
45	"*" if following is a change since last report
46-53	One of "CRUISE" "INERTIAL" "ALL_SPIN"
54	","
56-59	"TASK"
60	"*" if following is a change since last report
61-72	One of "LAUNCH" "DEPLOYMENT" "ENTRY" "AXIAL-10-N" "SPIN-UD""SPIN-HIGH" "BURN-400-N" "HI-RATE-CORR" "SPIN-CORR" "HGA-CORR" "SUN-ACQ" "TRANSITION" "TURN-BURN"
73	","
75-79	"ACCEL"
80	"*" if following is a change since last report
81-83	"ON" or "OFF"
84	","
86-89	"LBA1" Linear Boom Actuator 1
90	"*" if following is a change since last report

91-96	[-]ddddd Position change as a result of command Range: -32768 to 32767
98-101	dddd Absolute position of LBA1 Range: 0 to 1023
103-104	"DN"
105	","
107-110	"LBA2" Linear Boom Actuator 2
111	"*" if following is a change since last report
112-117	[-]ddddd Position change as a result of command Range: -32768 to 32767
119-122	dddd Absolute position of LBA2 Range: 0 to 1023
124-125	"DN"
126	";"

Continuation Line:

41-45	"GYROS"
46	"*" if following is a change since last report
47-49	"ON" or "OFF"
50	","
52-55	"PTDB"
56	"*" if following is a change since last report
57-63	Value from 0.96 to 785.299 with at least one digit before and after the decimal point.
64	","
66-69	"TMOT"

70	"*" if following is a change since last report
71-73	One of "RTH" "MVR" "SUN" "BB1" "BB2" "TMC"
74	";"

4.2.2.7 PB (Playback) STATUS EVENT. This event shall be generated by 6TMREC, 6BUFHI, 6BUFLO CMDs & Low Rate Playback (LRPB) Model

Columns	Content
1-34	Times, see 4.2.2
35-37	"PB:" Status Event Name
39	"*" if following is a change since last report
40-46	Choice of: "INIT," "PAUSE," "RESUME," "TERM,"
48-50	"PRB" Priority buffer
51	"*" if following is a change since last report
53	Water level of PRB in VCDU (1 digit)
54-58	", MUB" Multi-use Buffer
59	"*" if following is a change since last report
60-62	Water level of MUB in VCDU (up to 3 digits)
63-69	", TRACK"
70	"*" if following is a change since last report
71	Choice of "0" "1" "2" "3" "4"
72-76	", TIC"
77	"*" if following is a change since last report

78-84	Tape Increment Count (TIC) of up to 4 digits, a decimal point, and 2 digits to the right of the decimal point.
85-91	", BUFHI"
92	"*" if following is a change since last report
93	the commanded high water level limit (choice of 1 thru 9), representing tenths of buffer size. Effective limit is integer product of buffer size in VCDUs times limit divided by ten.
94-100	", BUFLO"
101	"*" if following is a change since last report
102	the commanded low water level limit (choice of 1 thru 9), representing tenths of buffer size. Effective limit is integer product of buffer size in VCDUs times limit divided by ten.
103	";"

4.2.2.8 BITS STATUS EVENT. This event provides the number of bits that were packetized during the past interval. The interval is user specified. By default, it is an 12 hour interval. (Please refer to *PBTINT Instruction in the SEQGEN User's Guide.)

Interval measurements will be in integer bits. Cumulative measurements will be reset at low rate playback initiation and termination. Cumulative values will be expressed as megabit floating point numbers with six digits to the right of the decimal point.

The BITS status event will be printed before and after low rate playback is initiated and terminated, and at the end of each incremental interval from such juncture.

Columns	Content
1-34	Times, see 4.2.2
35-39	"BITS:" Status Event Name
41-47	"INTRVL+" time interval
48-55	Time interval in the format of hh:mm:ss

68-70	"PRB"
72	"+"
73-81	Priority buffer data packetized during the past interval
82	"="
83-92	Accumulated priority buffer data
93	","
95-97	"RTS" Real Time Science Data
99	"+"
100-108	Real time science data packetized during the past interval
109	"="
110-119	Accumulated real time science data
120	","

Continuation Line:

41-42	"PB" Playback Data
45	"+"
46-54	Playback data packetized during the past interval
55	"="
56-65	Accumulated playback data
66	","
68-71	"RRCC" Record Rate Change Coverage
72	"+"
73-81	RRCC data packetized during the past interval

82	"="
83-92	Accumulated RRCC data
93	","
95-96	"DL" Downlink data
99	"+"
100-108	Downlink data framed during the past interval, including coding, overhead and fill
109	"="
110-119	Accumulated downlink data
120	","

Continuation Line:

41-43	"BDT" Buffer Dump to Tape data
45	"+"
46-54	BDT data recorded during past interval
55	"="
56-65	Accumulated BDT data
66	“,”
68-71	“CFIL” Commanded fill data (6TMSED Command)
72	“+”
73-81	Commanded fill data downlinked during the past interval
82	“=”
83-92	Accumulated commanded fill data
93	“,”

95-98	“AFIL” Autonomous fill data
99	“+”
100-108	Autonomous fill downlinked during the past interval
109	“=”
110-119	Accumulated autonomous fill data
120	“,”

Continuation Line:

41-44	“LOST” Bits lost due to PRB or MUB overflow
45	“+”
46-54	Lost bits during the past interval
55	“=”
56-65	Accumulated lost bits
66	“;”

4.2.2.9 INST_REC_SEL STATUS EVENT. This event shall be triggered by the commands 6RCSEL, 6RCDSL for selecting or deselecting instruments from record.

Columns	Content
1-34	Times, see 4.2.2
35-47	"INST_REC_SEL:" Status Event Name
49-51	"DDS"
52	"*" if following is a change since last report
53-56	Choice of: "SEL," "DSL,"
58-60	"EPD"

61	"*" if following is a change since last report
62-65	Choice of: "SEL," "DSL,"
67-69	"EUV"
70	"*" if following is a change since last report
71-74	Choice of: "SEL," "DSL,"
76-78	"HIC"
79	"*" if following is a change since last report
80-83	Choice of: "SEL," "DSL,"
85-87	"PLS"
88	"*" if following is a change since last report
89-91	Choice of: "SEL" "DSL"
92	";"

4.2.2.10 INST_RT_SEL STATUS EVENT. This event shall be triggered by the commands 6RTSL1, 6RTDS1, 6RTSL2, 6RTDS2 for selecting or deselecting instruments and real time engineering from the R/T downlink.

Columns	Content
1-34	Times, see 4.2.2
35-46	"INST_RT_SEL:" Status Event Name
48-50	"DDS"
51	"*" if following is a change since last report
52-55	Choice of: "SEL," "DSL,"
51-59	"EPD"
60	"*" if following is a change since last report

61-64	Choice of: "SEL," "DSL,"
66-68	"EUV"
69	"*" if following is a change since last report
70-73	Choice of: "SEL," "DSL,"
75-77	"HIC"
78	"*" if following is a change since last report
79-82	Choice of: "SEL," "DSL,"
84-86	"MAG"
87	"*" if following is a change since last report
88-91	Choice of: "SEL," "DSL,"
93-96	"NIMS"
97	"*" if following is a change since last report
98-101	Choice of: "SEL," "DSL,"

Contination Line:

48-50	"PLS"
51	"*" if following is a change since last report
52-55	Choice of: "SEL," "DSL,"
57-59	"PWS"
60	"*" if following is a change since last report
61-64	Choice of: "SEL," "DSL,"
66-68	"UVS"
69	"*" if following is a change since last report

70-73	Choice of: "SEL," "DSL,"
75-77	"RTE"
78	"*" if following is a change since last report
79-82	Choice of: "SEL," "DSL,"
84-87	"AACS"
88	"*" if following is a change since last report
89-91	Choice of: "SEL," "DSL,"
92	";"

4.2.2.11 RRCC STATUS EVENT. This event shall be generated when there is a change from one record rate to another while RRCC is set to > 0 minor frame. It will report the actual gap and the number of RRCC minor frames.

Columns	Content
1-34	Times, see 4.2.2
35-39	"RRCC:" Status Event Name
41-63	"Minor Frames Collected:" controlled by 6RCSET & 6RCCLR commands
65-66	Number of mf collected (2 digits)
67	","
69-82	"VCDUs created:"
84-85	2 digit #VCDUs
86	";"

4.2.2.12 PBSELVECT STATUS EVENT per ECR 35566, Table 4.3.2. This event displays the current location in the current segment, record time, together with the integrated PBT selection status of all selectable "instruments". When several PBT entries have the same record time, this event will be issued only after the last such entry is encountered. Therefore several instruments could be marked as changed. This event will be generated by the Low Rate Playback process.

Columns	Content
1-34	Times, see 4.2.2
35-44	PBSELVECT: Status Event Name
46-50	"SEGNO"
51	"*" if following is a change since last report
52-54	Number of current segment, 1 to 255
55	","
57-61	"ENTRY"
63-64	Entry number in the current segment of the current PBT entry. Always changes. (1-62)
65	","
67-70	"RECT"
72-90	Record time from current PBT entry.
91	","
93-98	"RECFMT"
99	"*" if following is a change since last report
100-102	Record format from most recent SINGLE, RECFMT entry. While this does not match record format of the corresponding ECMD RECREC the effect will be that nothing is selected. 3 chars.
103	","

105-109	"AACS2"
110	"*" if following is a change since last report
111-114	"Choice of "SEL," or "DSL,"
116-119	"DDS2"
120	"*" if following is a change since last report
121-124	"Choice of "SEL," or "DSL,"

Contination Line:

41-44	"ENG2"
45	"*" if following is a change since last report
46-49	"Choice of "SEL," or "DSL,"
51-54	"EPD2"
55	"*" if following is a change since last report
56-59	"Choice of "SEL," or "DSL,"
61-64	"EUV2"
65	"*" if following is a change since last report
66-69	"Choice of "SEL," or "DSL,"
71-74	"HIC2"
75	"*" if following is a change since last report
76-79	"Choice of "SEL," or "DSL,"
81-84	"MAG2"
85	"*" if following is a change since last report
86-89	"Choice of "SEL," or "DSL,"

91-95	"NIMS2"
96	"*" if following is a change since last report
97-100	"Choice of "SEL," or "DSL,"
102-105	"PLS2"
106	"*" if following is a change since last report
107-110	"Choice of "SEL," or "DSL,"

Contination Line:

41-44	"PPR1"
45	"*" if following is a change since last report
46-49	"Choice of "SEL," or "DSL,"
51-54	"PPR3"
55	"*" if following is a change since last report
56-59	"Choice of "SEL," or "DSL,"
61-64	"PWH2"
65	"*" if following is a change since last report
66-69	"Choice of "SEL," or "DSL,"
71-74	"PWH5"
75	"*" if following is a change since last report
76-79	"Choice of "SEL," or "DSL,"
81-84	"PWL3"
85	"*" if following is a change since last report
86-89	"Choice of "SEL," or "DSL,"

91-94	"SSI1"
95	"*" if following is a change since last report
96-99	"Choice of "SEL," or "DSL,"
101-104	"UVS2"
105	"*" if following is a change since last report
106-108	"Choice of "SEL" or "DSL"
109	";"

4.2.2.13 TLMFRAME STATUS EVENT. This event provides the count of telemetry frames since the previous TLMFRAME event, the number of VCDU from each type of data and the water levels of the priority buffer and the multi-use buffer. The sum of the VCDU counts will always be exactly 4 (the number of VCDUs in a telemetry frame) times the number of frames in the reporting interval (*TLMFRM command).

Columns	Content
1-34	Times, see 4.2.2
35-43 "	TLMFRAME:" Status Event Name
45-49	Count of telemetry frames from sequence start (up to 4 digits) or PB init.
50	","
52-54	"PRB"
56-59	Number of VCDUs from the Priority buffer
60	","
62-63	“PB”
65-68	Number of VCDUs from the playback data
69	","
71-73 "	BDT"

75-78	Number of VCDUs from the buffer dump to tape data
79	","
81-83	"PAD"
85-88	Number of PAD VCDUs originating from the SET_BUF ECMD
89	","
92-95	"RRCC"
97-100	Number of VCDUs from the RRCC data
101	","
103-105	"RTS"
107-110	Number of VCDUs from the Real time science data
111	","
113-116	"FILL"
118-121	Number of VCDUs from the fill data
122	","

Contination Line:

35-51	"WATER LEVEL: PRB" Priority buffer
53-55	Water level of PRB in VCDU (up to 3 digits)
56	","
58-60	"MUB" Multi-use Buffer
62-64	Water level of MUB in VCDU (up to 3 digits)
65	";"

4.2.2.14 INST_RT_DATA EVENT. This event shall accompany each BITS EVENT (See 4.2.2.8). It presents cumulative values of bits packetized for each instrument or engineering source.

Cumulative values will be reset at low rate playback initiation and termination. Cumulative values will be expressed as megabit floating point numbers with six digits to the right of the decimal point.

The INST_RT_DATA status event will be printed before and after low rate playback is initiated and terminated, and at the end of each incremental interval from such juncture.

Columns	Content
1-34	Times, see 4.2.2
35-47	"INST_RT_DATA:" Status Event Name
49-51	FMT
52	"*" if following is a change since last report
53-55	<Current realtime format> e.g. DL4
56-61	", DDS"
62	"*" if following is a change since last report
64-73	Accumulated data
74-78	", EPD"
79	"*" if following is a change since last report
81-90	Accumulated data
91-95	", EUV"
96	"*" if following is a change since last report
98-107	Accumulated data
108-112	", HIC"

113	"*" if following is a change since last report
115-124	Accumulated data
125	","

Continuation Line:

42-44	"MAG"
45	"*" if following is a change since last report
47-56	Accumulated data
57-62	", NIMS"
63	"*" if following is a change since last report
64-73	Accumulated data
74-78	", PLS"
79	"*" if following is a change since last report
81-90	Accumulated data
91-95	", PWS"
96	"*" if following is a change since last report
98-107	Accumulated data
108-112	", UVS"
113	"*" if following is a change since last report
115-124	Accumulated data
125	","

Continuation line:

42-45 "AACS"

46	"*" if following is a change since last report
47-56	Accumulated data
57-61	", RTE"
62	"*" if following is a change since last report
64-73	Accumulated data
74-85	", LRPB state"
87-89	"IPB", "TPB", "PPB", or "RPB"
90	";"

4.2.2.15 INST_PB_DATA EVENT per ECR 35566, Table 4.3.2. This event presents cumulative values of bits packetized for each kind of instrument or engineering data that can be selected in a playback table (PBT).

Cumulative values will be reset at low rate playback initiation and termination. Cumulative values will be expressed as megabit floating point numbers with six digits to the right of the decimal point.

The INST_PB_DATA status event will be printed after low rate playback is initiated, before it is terminated, and any time the ACT_NAME in an expiring RECREC ECMD is about to be replaced by an new ACT_NAME in the next RECREC.

The cumulative data values will be zero in the first INST_PB_DATA event after playback initialization. They will contain the accumulations from initialization through the end of the named ACT_NAME, or for the entire playback at playback termination.

Columns	Content
1-34	Times, see 4.2.2
35-47	"INST_PB_DATA:" Status Event Name
50-68	<record time at playback initiation, at playback termination, or when ACT_NAME in RECREC ECMD is about to be replaced>

71-84	<PB_INITIATION or PB_TERMINATION or ACT_NAME in RECREC ECMD that is about to be replaced by another ACT_NAME in another ECMD>
96-100	"AACS2"
101	"*" if following is a change since last report
102-111	Accumulated data
112-117	", DDS2"
118	"*" if following is a change since last report
120-129	Accumulated data
130	","

Continuation Line:

42-45	"ENG2"
46	"*" if following is a change since last report
48-57	Accumulated data
58-63	", EPD2"
64	"*" if following is a change since last report
66-75	Accumulated data
76-81	", EUV2"
82	"*" if following is a change since last report
84-93	Accumulated data
94-99	", HIC2"
100	"*" if following is a change since last report
102-111	Accumulated data

112-117	", MAG2"
118	"*" if following is a change since last report
120-129	Accumulated data
130	","

Continuation line:

42-46	"NIMS2"
47	"*" if following is a change since last report
48-57	Accumulated data
58-63	", PLS2"
64	"*" if following is a change since last report
66-75	Accumulated data
76-81	", PPR1"
82	"*" if following is a change since last report
84-93	Accumulated data
94-99	", PPR3"
100	"*" if following is a change since last report
102-111	Accumulated data
112-117	", PWH2"
118	"*" if following is a change since last report
120-129	Accumulated data
130	","

Continuation line:

42-45	"PWH5"
46	"*" if following is a change since last report
48-57	Accumulated data
58-63	", PWL3"
64	"*" if following is a change since last report
66-75	Accumulated data
76-81	", SSI1"
82	"*" if following is a change since last report
84-93	Accumulated data
94-99	", UVS2"
100	"*" if following is a change since last report
102-111	Accumulated data
112-117	", BDTT"
118	"*" if following is a change since last report
120-129	Accumulated data
130	";"

4.2.2.16 BDTT EVENT. This event presents the duration of the RECREC, the net VCDUs and the gross VCDUs from the MUB. It appears in the SEQGEN SEF at the completion of a Buffer Dump to Tape. It is coincident with the creation of a BDT RECREC.

Columns	Content
1-34	Times, see 4.2.2
35-40	"BDTT: " Status Event Name
41-51	"Lasted for"
52-60	Duration in the format of +hh:mm:ss (i.e., duration of the RECREC)
61-74	", Net VCDUS = " Net VCDUs are from the formula MAX(0, <Gross> <MUB>), where <MUB> represents the current contents of the MUB, which consists of the sum of the types of VCDUs that can occupy the MUB (such as Playback, Pad, RRCC, RTS), except for PWS fill.
75-TBD	Net VCDUS in integer, not in fixed format
TBD	", Gross VCDUS = " Gross VCDUs are computed from the duration, using 7680 bits per second and 446 bytes per VCDU.
TBD	Gross VCDUS in integer, not in fixed format
TBD	";"

4.3 EXAMPLE SPACECRAFT EVENT FILE

(Please see your local library for hard copy of this section)