SOE: ASCII File Definition

For SOEEDT VB.20, May 20, 1995 (MGDS V22.0)
Last update: August 2, 1996
Still to do: Need a better sample file showing CHANNEL and KEYWORD records

General Format

The SOE file is a machine-readable ASCII document that completely describes the screen and hardcopy images of the formatted SOE. The SOE file is not intended to be read by humans without a special viewer. General features of the file are:

- The only characters in the file shall be the printable ASCII characters (33 through 126), the space character (32), and the linefeed or newline character (10). No other characters are permitted in the file.
- Lines of text shall be delimited by a single linefeed character ("\n" or <lf>). The delimiter appears at the end of the line, and is not included in the character count used to determine the maximum length of a legal line. The file must end with the delimiter. This is the true delimiter for ASCII files on UNIX systems.
- The maximum length of a line is 132 characters. This is so that the file may be edited in a large window and may be printed.

The file consists of four parts, which are:

- **SFDU Header** - SFDU labels and a catalog header for use with the central (project) database.
- **History Section** - A list of input files, programs used to generate this SOE, and users who have edited this SOE.
- **Format Section** - All time independent objects which appear on all pages: text, images, clocks, and mode bars (containers for mode changes).
- **Events Section** - All time dependent objects.

Except for the SFDU Header, all sections begin with a keyword record. A keyword record is a single line of text consisting of two dollar signs followed by the keyword. All keywords consist of upper case letter. The final record in the file is the keyword record: $$EOF.

SFDU Header

The SFDU header indicated that the SOE file is a nested LVO consisting of a catalog LVO and a data LVO. Here is a sample SFDU header:

```
CCSD3ZF0000100000001NJPL3KS0L015$$MARK$$
MISSION_NAME = GALILEO;
SPACECRAFT_NAME = GALILEO;
DSN_SPACECRAFT_NUM = 77;
DATA_SET_ID = SOE;
```

FILE_NAME = 071194-081594.soe;
APPLICABLE_START_TIME = 1994-192T00:00:00;
APPLICABLE_STOP_TIME = 1994-227T00:00:00;
PRODUCT_CREATION_TIME = 1994-166T16:31:10;
PRODUCER_ID = MCT;
CCSD3RE00000$$MARK$$NJPL3IF0028000000001

The first label (CCSD3ZF0000100000001) is the overall LVO label. The breakdown of characters in the label is:

CCSD - control authority identification (CAID).
3 - version.
Z - this is an overall nested LVO.
F - this LVO is delimited by an end-of-file.
0 - a filler character.
0001 - the data designator identification (DDID) for an overall nested LVO.
00000001 - must be 1 (number of end-of-files) for disk files.

The overall LVO contains two more LVOs: the catalog information and the data. The label for the catalog information (NJPL3KS0L015$$MARK$$ follows immediately.

NJPL - control authority identification (CAID).
3 - version.
K - this is an catalog LVO.
S - this LVO is delimited by a marker.
0 - a filler character.
L015 - the data designator identification (DDID) for a catalog LVO.
$$MARK$$ - the last 8 characters of the marker.

The marker is an obsolete JPL-only style marker: CCSD3RE00000$$MARK$$. At some point, this SIS should be updated to use the official CCSDS marker: CCSD$$MARKER$$MARK$$. For both marker styles, the first 12 bytes are constant, and the last 8 bytes are specified in the label for this LVO.

The catalog data is written in PVL. Each line is a parameter name followed by an equals sign, a value, and a semicolon. The nine parameters given in the example are required, but may be present in any order.

The data label follows the end-of-catalog marker.

NJPL - control authority identification (CAID).
3 - version.
I - this is a data LVO.
F - this LVO is delimited by an end-of-file.
0 - a filler character.
0280 - the data designator identification (DDID) for SOE data.
00000001 - must be 1 (number of end-of-files) for disk files.

Note that since both the overall and data LVOs are delimited by the same end-of-file, there are no markers at the end of the SOE file.

History Section

The History Section of the SOE file starts with the $$HISTORY keyword record and ends at the start of the next keyword delimited section. Each record in the History Section is a single line of text containing four space delimited words. There are three types of records:

- **File Records** are used to identify files that were input to create this SOE. File Records contain the following four words: FILE, the creation time of the file, the type of file (typically a MOSO data set id), and the name of the file.
- **Program Records** are used to identify programs that were used to create this SOE. Program Record contain the following four words: PRGM, the creation time of the program, the version of the program, and the name of the program.
- **Edit Records** are used to identify persons who edited this file. Edit Records contain the following four words: EDIT, the time of the edit, the user name of the person doing the edit, and the host name on which the edit was done.

Format Section

The Format Section of the SOE file starts with the $$FORMAT keyword record and ends at the start of the next keyword delimited section. Each line in this part constitutes a self-contained record. The type of the record is determined by the first character on the line. The second character on the line is always a comma (,). All of the following fields in the record are also separated by commas.

Eight types of records are permitted in the Format Section:

- **Horizontal (H) Line Position Record** - defines the row positions for the three horizontal lines that appear on the SOE.
- **Title (T) Text Records** - define
- **Color (K) Definition Records** - define the color codes used when displaying the SOE.
- **Border (B) Definition Records** - define the borders used around special events.
- **Visible (V) Column Description Records** - define the visible columns in the SOE file.
- **Invisible (I) Column Description Records** - define the invisible columns in the SOE file.
- **Deleted (D) Item Marker Record** - define the SOE record that replaces a deleted item.
- **Sort (S) Code Definition Records** - define the filter codes and their definitions.

The SOE image has been defined to be fundamentally a fixed width text document with some graphics embellishments. It is also possible to produce a pure text version of the SOE for printing on high speed line printers or viewing in a text window. A single page is 132 columns by 55 rows. The row and column number of the character at the upper left corner of the page is (1, 1).

Horizontal (H) Line Position Record

There are three horizontal lines on the SOE image that span all of the columns.

Only one Horizontal Line Position record is permitted in the Format section. This record is a single line of text starting with the letter H followed by the following parameters:

1. **First Line** (integer) - location of the horizontal line between the Title Area and Column Labels.
2. **Second Line** (integer) - location of the horizontal line between the Column Labels and the Event Area.
3. **Last Line** (integer) - location of the horizontal line below the Event Area. This should be the last available line: 55.

The following example defines rows 1 to 4 as the title area, places column labels in rows 6 and 7, and gives 46 rows for events.

```
H,5,8,55
```

Title (T) Text Records

Title text is common text that appears on all pages of the SOE document. It should be located only in the title area, however this is not enforced. This record is a single line of text starting with the letter T followed by the following parameters:

1. **Row** (integer) - row location to place the text string.
2. **Column** (integer) - column location to place the first character in the text string.
3. **Text** (string) - the literal text that is to be placed on the form. There are several special codes that may be in the text field and which are replaced when printed. These are:

$T Day-of-year of last edit
$R Year of last edit
$M Month of last edit
$A Day of month of last edit
$C Clock time (hh:mm:ss) of last edit
$Z Time zone in use for edit times
$D Day-of-year of this page
$Y Year of this page
$P Current page number
$S Sequence id
$N Three digit spacecraft number
$F Filter codes active
$I First input file from history
$O The name of the current file
$$ A literal dollar sign

The following example shows how one could add a UTC day and a page number.

```
T,1,79,GENERATED ON YEAR-DAY: $R-$T PAGE $P
```

Color (K) Definition Records

A total of 18 colors may be displayed on the SOE page. These are the background color, the highlight color, and 16 foreground colors. If these are not specified in the format of the

SOE, the resources for the drawing area are consulted. A color record is a single line of text starting with the letter K followed by the following parameters:

1. **Index** (character or integer) this may be B for the background color, B for the highlight color, or a number from 0 through 15 to specify the foreground colors.
2. **Color** (string) - may be any valid color name in the X11 color database. See the file /usr/lib/X11/rgb.txt for a list of legal colors.

Border (B) Definition Records

A total of 31 borders may be defined to make certain SOE events stand out. The border appears above and below the description field of the event in the image of the SOE. The border is a graphics object, and adds two rows to the displayed item description. A border record is a single line of text starting with the letter B followed by the following parameters:

1. **Index** (integer) - is an integer from 1 through 31. The index 0 is predefined to mean no border, and therefore requires no definition in the format section.
2. **Label** (string) - is a short text mnemonic that will appear in the border menu of the editor.
3. **Export Character** (character) - is a single character that will be repeated above and below the description in the text-only (export) version of the SOE image. For example, if the graphic border were a pair of parallel horizontal lines, one might choose an equals sign (=).
4. **Line List** (string) - is a series of 4n comma separated integers, where each group of four integers specifies a line segment. This sequence defines a character wide pattern which is repeated over the width of the description field of the SOE image. The coordinates are defined so that the character width is 100 units and the origin is at the left center of the pattern area.

   The four integers that define each line segment are: the horizontal (x) coordinate of the start of the line, the vertical (y) of the start of the line, the horizontal (x) coordinate of the end of the line, and the vertical (y) of the end of the line.

   The sizes of these patterns have been exaggerated, and in fact, the patterns will be scaled so that 100 units is equal to the width of the font.

Visible (V) Column Description Records

The various text fields in the SOE file may map onto columns in the SOE image. These are described by visible column records. A visible column record is a single line of text starting with the letter V followed by the following parameters:

1. **Index** (integer) - is given by the table in the section on Event Records, and specifies he position of the field in the SOE file. Two special character indices are permitted: a T is used to select the time value, and an N is used to select the item number.
2. **Column** (integer) - is an integer starting from 0 which specifies the column number on the SOE image.
3. **Width** (integer) - is the width of this column. The sum of all the widths plus the total number of columns minus one should be less than or equal to 132. If there are n

columns in the SOE image, then there should be visible column records for each one from zero through n - 1.

4. **Flag** (character) - is one of three characters.

S
: Single line text that is limited to the specified character width.

M
: Multiline text that has a given character width in the SOE image. Only the description field should
generally permit multiline text.

W
: Wrapped single line text that is too long to display in the popup. The width of the field specifies only the width of the popup, and does not limit the length of the text field. This option is meant to be used with the invisible column descriptions discussed in the next section.

5. **Label** (string) - is used to define the column header and is also used in the edit popup to identify the field. The label field may contain a literal newline which is encoded as \n as in C. This newline will correctly format the column header on the SOE image, but will be converted to a space in the popup label.

Invisible (I) Column Description Records

Invisible Column Description Records are the same as the visible ones except that no Column field is present. These are used to identify fields that are needed in the SOE file for further processing, but are not to be displayed on the SOE image. The DSN Keyword information falls into this category. An invisible column record is a single line of text starting with the letter I followed by the following parameters:

1. **Index** (integer) - is given by the table in the section on Event Records, and specifies the position of the field in the SOE file. Two special character indices are permitted: a T is used to select the time value, and an N is used to select the item number.
2. **Width** (integer) - is the width of this column. The sum of all the widths plus the total number of columns minus one should be less than or equal to 132. If there are n columns in the SOE image, then there should be visible column records for each one from zero through n - 1.
3. **Flag** (character) - is one of three characters.

S
: Single line text that is limited to the specified character width.

M
: Multiline text that has a given character width in the SOE image. Only the description field should generally permit multiline text.

W
: Wrapped single line text that is too long to display in the popup. The width of the field specifies only the width of the popup, and does not limit the length of the text field. This option is meant to be used with the invisible column descriptions discussed in the next section.

4. **Label** (string) - is used to define the column header and is also used in the edit popup to identify the field. The label field may contain a literal newline which is encoded as \n as in C. This newline will correctly format the column header on the SOE image, but will be converted to a space in the popup label.

Deleted (D) Item Marker Record

When an item is deleted in the SOE editor after that SOE has been officially released, it is useful to leave a marker in place of the deleted item for future reference. The delete record specifies this marker. The delete record is a single line of text starting with the letter D followed by fields which are identical to those in the text fields of the event records. Note that no time field is necessary, since the delete marker will be inserted at the same time as the deleted record. If this record is not included in the SOE file, a default delete record is used

D,ERT,,,0,0,0,1,,DELETED ITEM

Sort (S) Code Definition Records

A sort code is a single character appearing in the sort code field of an event record. These records are used to create the sort code popup in the SOE editor. An event may contain any number (up to the number specified in the column definition for the sort code) of sort characters. The more correct name for a sort code is a filter code, but sort code is used for historical reasons. A sort code record is a single line of text starting with the letter S followed by the following parameters:

1. **Code** (character) - is any printable character but should not be a comma (,).
2. **State** (integer) - is a 1 or a 0. A 1 indicated that events with that filter code are to be included in the filtered SOE.
3. **Definition** (string) - is a brief description of the filter code that will appear in the popup.

Event Records

In the current version of the SOE file format, there are three legal types of event records. These are:

1. **time-tagged event** records,
2. **channel** records, and
3. **keyword** records.

When an SOE file is loaded into a program, the time-tagged event records should be loaded into a simple ordered list. Each time-tagged event record may contain an optional list of channel records, and an optional list of keyword records. The channel and keyword records may appear in any order, but the order within records of the same type, channel or keyword, is preserved.

Each of these records consists of a SFOC standard time code (for event records) or an identifying keyword plus up to 32 comma separated text fields. The total length of the text (including commas) must be less than or equal to 4095 characters. Since lines are limited to 132 characters, continuation lines are necessary.

The SFOC standard time code with a resolution of one second is: yyyy-dddThh:mm:ss and requires 17 characters. The time code appears at the start of the first line of the record, and is followed by a single space. Channel records start with the word CHANNEL followed by eleven spaces. Keyword records start with the word KEYWORD followed by eleven spaces. Continuation lines always begin with 18 space characters. In all cases, the text fields begin in column 19.

Linefeeds between lines of continued records are ignored, and the last character of the previous line will be joined to the character in column 19 of the continuation line. Lines do not have to be the maximum 132 characters. This is useful if records are generated by hand, but most software will always cut the record at 132 characters.

Since the comma is used as a text field separator, it must be escaped when used in a text field. The two character sequence \, represents a literal comma in a text field. Literal newlines may be embedded in the fields using the C standard (\n). The reason for this is that a field should be thought of as the basic component of an event rather than a line. A literal backslash is represented by \\. Since linefeeds are ignored in a single record, it is possible to have the backslash of a two character sequence appear at the end of one line, and have the second character appear at the start of the next line.

Time-tagged Event Records

The only required events are the time-tagged event records. The fields are defined by the following tables. Note that the field number is the count of the fields in the SOE record. The index is the number used in the SOE editor to identify simple text fields. This is the number identified in the formatting information. Some fields are not stored internally by the SOE Editor as text, and thus do not have index numbers.

The first nine fields are defined and treated specially by the SOE editor.

Field	Index	Name	Description
1	T	Time Type	Required field. A code to identify the type of time (relative to the spacecraft). The following three character codes are defined: SCE (Spacecraft event time), ERT (Earth received time), TRM (Transmit time), and GEV (Ground event time).
2	1	S/C ID	Required field. Spacecraft identification number. The spacecraft identification number. For a single mission printout, this field need not appear in the printout or display, but it must appear in the file. The spacecraft id shall be the assigned number such as 31 and 32 for the Voyagers or 94 for Mars Global Surveyer.
3	2	Load No.	Required field. Identification for this load. Currently this may be empty, however in a multimission SOE, three fields uniquely identify each event: the spacecraft, the load, and the item number.
4	N	Item No.	Supplied by SOE Editor. Should be null (two commas in a row) in the initial SOE file from the Generator. A unique index number always increasing with time will identify the event. In the initial release of an SOE, integers shall be used. Additional events added to the

			SOE after its official release will be identified by fractional index numbers. For example event 238.1 lies between event 238 and event 239. The item number may have a maximum of three digits to the right of the decimal point (e.g.: 238.001 below 238.01). Item numbers must be greater than zero and less than 4,294,967.
5	-	Page No.	Supplied by SOE Editor. Should be null (two commas in a row) in the initial SOE file from the Generator. Valid page numbers may contain up to three places to the right of the decimal point. Page numbers must be greater than zero and less than 4,294,967.
6	-	Set No.	Optional. Items that are to be thought of as belonging to a particular set have the same set number. This is to be stored as an unsigned 32 bit number. An item may be contained in only one set. This field may be empty, in which case it should be be null (two commas in a row) or zero.
7	-	Display Flags	Required. This is a bit field represented as a decimal integer, and specifies the color of the text (4 bits), whether to highlight (1 bit), border information for the description field (5 bits), and whether to display change bars. The value of the flag is thus: 1024 change + 32 border + 16 highlight + color. It should be set to zero if not used.
8	3	Sort Code	Optional. This is a string of characters where each character represents a class of item. For example, C might represent command and P might represent the power subsystem. The character codes are user defined and may appear in any order.
9	4	Description	Optional. If this field is empty (two commas in a row), the event will appear only in the DSN Keyword File. This is generally the only multiline field where embedded newlines (\n) are permitted. Either this field or the Keyword Name field (or both) must be used.

The remaining fields are treated simply as text by the SOE editor, however must be defined consistently for other SEG programs. The following are the field definitions used by Mars Global Surveyer.

Field	Index	Name	Description
10	5	Command	Optional. Used when the event is a S/C

			command. Contains the second PEF field (following "CMD," in column 38 of PEF.
11	6	Action By and To	Optional for project SOE. Required for Keyword file.
12	7	Telemetry Format	Optional. Unknown whether MGS will use this field. Will be required every time format changes, if any.
13	8	S/C Subsystem	Optional. Used when the event is a S/C command.
14	9	S/C Clock field.	Optional. Unknown whether MGS will use this Columns 1-14 of EPEF.
15	10	S/C Event Time field.	Optional. Unknown whether MGS will use this Columns 16-36 of EPEF.
16	11	DSS ID	Two digit DSN Station Identifier. Required when Keyword Name is used.
17	12	Relative Time	Optional. Event time expressed relative to an epoch time (such as Launch) instead of absolute time. If used for ordering file
18	13	Keyword Name	Optional. Must be used if event is to be included in DSN Keyword File. Must be one of the valid DSN keywords listed in OPS-6-13.
19	14	Keyword Var. 1	Optional. Used whenever Keyword Name field is used and has an associated variable.
20	15	Keyword Var. 2	Optional. Used whenever Keyword Name field is used and has an associated variable.
21	16	Keyword Var. 3	Optional. Used whenever Keyword Name field is used and has an associated variable.
22	17	Keyword Var. 4	Optional. Used whenever Keyword Name field is used and has an associated variable.
23	18	Keyword Free Text	Optional. Used whenever Keyword Name field is used and has associated free text.
24	19	Trace	Optional. Unique ID for each event.

Channel Records

In the early versions of SEG, two SOE files were produced. One showing all of the channels affected by a spacecraft command, and one without the channel information. The channel record was added so that this channel information could be displayed optionally from a single SOE file.

These records have the word CHANNEL in place of the the time-tag. These records are an extension of the the previous time-tagged record, and all Channel Records up to the next time-tagged record are appended to a list owned by the previous time-tagged record.

The current Channel Records have the word CHANNEL, followed by 11 spaces, then 8 commas, and finally the free text. The free text can be optionally displayed by the SOE editor in the decsription column below the actual description. The 8 commas actually delimit fields which are currently unused. If a real comma were needed in the free text field, it should be escaped with a backslash. Channel Records may be continued by following them with a record starting with 18 spaces.

Keyword Records

Keyword Records were introduced to permit a single SOE event to generate multiple events in the DSN Keyword File (DKF). The current version of the dkfgen program which reads the SOE and writes out a DSN Keyword File understands keyword information in both the time-tagged record, and in the Keyword Records. Eventually, all keyword data should be placed in these Keyword Records rather than in the invisible fields of the time tagged records.

Keyword Records all begin with the word KEYWORD followed by 11 spaces instead of a time-tag. The remaining fields are comma separated and are predefined based on the required fields in the DSN Keyword File:

1. **Time Offset** - This is an integer indicating the number of seconds this DKF Event should be offset from the parent SOE Event. Typically, this value is 0.
2. **Spacecraft Number** - Numerical S/C identifier per module OPS-6-7 or OPS-6-8.
3. **Station** - Two-character station identifier for facility affected by the DKF Event; right-justified with remaining spaces filled with zeros.
4. **Action** - The facilities or personnel involved in the SOE event; (see Table 5 of reference document OPS-6-13). In cases of multiple facilities (maximum of two permitted, separated by a blank) the left-most indicates "Action by" and the right-most indicates "Action to".
5. **Keyword** - The keyword parameter (up to 16 characters).
6. **Keyword Variable 1** - An associated keyword variable (up to 12 characters).
7. **Keyword Variable 2** - An associated keyword variable (up to 12 characters).
8. **Keyword Variable 3** - An associated keyword variable (up to 12 characters).
9. **Keyword Variable 4** - An associated keyword variable (up to 12 characters).
10. **Keyword Free Text** - Free text text may consist of up to 300 characters (including blanks). Do not delineated by open and closed brackets ('[',']'). These will be added by the dkfgen program when generating the DSN Keyword File.

A Sample SOE File

CCSD3ZF0000100000001NJPL3KS0L015$$MARK$$
MISSION_NAME = MARS_OBSERVER;
SPACECRAFT_NAME = MARS_OBSERVER1;
DSN_SPACECRAFT_NUM = 094;
DATA_SET_ID = SOE;
FILE_NAME = c4.mosc.soe;
APPLICABLE_START_TIME = 1992-316T16:01:48;

```
APPLICABLE_STOP_TIME = 1992-316T16:01:48;
PRODUCT_CREATION_TIME = 1992-003T18:49:32;
PRODUCER_ID = MCT;
CCSD3RE00000$$MARK$$NJPL3IF0028000000001
$$HISTORY
FILE 1991-347T16:55:23 SEQ_PREDICTED_EVENTS c4.mosc.epef.1
FILE 1991-178T14:09:31 LIGHTTIME owlt9295.txt
EDIT 1992-003T02:43:10 kevin nell
EDIT 1992-003T03:50:09 kevin nell
EDIT 1992-003T18:49:32 kevin nell
$$FORMAT
T,1,35,SOE YEAR-DAY: $Y-$D
T,1,79,PRINTED ON DAY: $T PAGE $P
T,2,2,MARS OBSERVER SOE FOR EPEF C4
T,3,2,CMD DESCRIPTIONS FROM SEG TRANSLATION TABLE
H,5,8,55
V,N,0,5,S,ITEM\nNO
V,T,1,12,S,GROUND TIME\nDDD HH:MM:SS
V,0,2,4,S,TIME\nBASE
I,1,3,S,S/C\nID
I,2,4,S,LOAD\nNO
I,3,8,S,SORT\nCODE
V,4,4,65,M,EVENT DESCRIPTION
V,5,3,7,S,COMMAND
I,6,7,S,ACTION
V,7,5,6,S,TLM\nFMT
V,8,7,4,S,SUB\nSYS
I,9,14,S,S/C CLK
V,10,8,16,S,S/C EVENT TIME
V,11,6,3,S,DSN
I,12,16,S,REL TIME
I,13,16,S,DSN KEYWORD
I,14,12,S,KEYWD VAR 1
I,15,12,S,KEYWD VAR 2
I,16,12,S,KEYWD VAR 3
I,17,12,S,KEYWD VAR 4
I,18,12,W,DSN FREE TXT
I,19,30,S,TRACE ID
K,0,black
K,1,red
K,2,brown
K,3,green
B,1,START BLOCK,@,0,0,100,0,0,50,100,50,0,-50,100,-50,50,50,50,-50
B,2,END BLOCK,=,0,20,100,20,0,-20,100,-20
D,ERT,,,0,0,0,17,DELETED ITEM
S,A,0,RFSAGC/CDUSNR
S,B,0,EPEF Note
S,C,0,Command
S,D,0,DSN
S,E,0,Error
$$EVENTS
1992-316T16:01:48 ERT,094,C4,1,1,0,32,N,PEF NOTE: START MOTFIG
                  BLOCK,,,,,0406051008:000,3
                  16 15:56:48.000
```

```
1992-316T16:01:48 ERT,094,C4,2,1,0,0,C,ENABLE ---> TRANSPONDER 1 2-WAY
                  NON-COHERENT MODE, TCM12E,,,TCOM,0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,3,1,0,0,C,ENABLE ---> TRANSPONDER 2 2-WAY
                  NONCOHERENT,TCM22E,,,TCOM,0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,4,1,0,0,C,TURN OFF -> TRANSPONDER 1
                  RANGING MODULATION,TCM1R F,,,TCOM,0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,5,1,0,0,C,TURN OFF -> TRANSPONDER 2
                  RANGING MODULATION,TCM2R F,,,TCOM,0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,6,1,0,0,C,TURN OFF -> TRANSPONDER 1
                  DIFFERENTIAL 1-WAY RANGING,TCM1DF,,, TCOM,
                  0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,7,1,0,0,C,TURN OFF -> TRANSPONDER 2
                  DIFFERENTIAL 1-WAY RANGING,TCM2DF,,,TCOM,
                  0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,8,1,0,0,C,TURN OFF -> TRANSPONDER 1
                  TELEMETRY MODULATION,TCM 1MF,,,TCOM,0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,9,1,0,0,C,TURN OFF -> TRANSPONDER 2
                  TELEMETRY MODULATION,TCM 2MF,,,TCOM,0406051008:000,316
                  15:56:48.000
1992-316T16:01:48 ERT,094,C4,10,1,0,64,N,PEF NOTE: END MOTFIG
                  BLOCK,,,,,0406051008:000,316
                  15:56:48.000
$$EOF
```

Note that in this example, the line limit has been set to less than 132 characters per line.

Operations Engineering Laboratory / Section 391 / Kevin.J.Miller@Jpl.Nasa.Gov