FORMAT.TXT Format Specification for STEP Data Exchange Files

1. File Organization

1.1 Single file per flight. If file exceeds disk size, the flight data should be continued on subsequent disks, repeating the header information, with incremented disk count. The file names in such cases should reflect that they are segments of the same flight file.

Note: If the flight data must extend over more than one disk, it will not be a single file in the PC or MS DOS sense, but the subsequent file names should be the same with an incremented file extension number.

1.2 The file naming convention will consist of a two character identifier (this could be initials of the measured quantity, or of the experimenter, the latter being best when there are duplicate instruments) and then the flight date. The extension should have a letter indicating the flight number for that day allowing for the possibility of multiple flights in a day. Finally there should be a number indicating the sequence number for that flight's data, to allow for multiple disks required for a single flight. In any event the extension should be added to each file; if there is only one flight and one disk the extension would be .A1. Examples:

```
SS870127.A1.........1st flight on Jan 27, disk no. 1
SS870129.B1.........2nd flight on Jan 29, disk no. 1
SS870205.A1.........1st flight on Feb  5, disk no. 1
SS870205.A2.........1st flight on Feb  5, disk no. 2
```

1.3 Required header info at the beginning of each file in specified format.

2. Header Format

2.1 Header should supply minimum required information in the format and order specified in section 2.4.

2.2 Additional information concerning the data may be added at the end of the header segment, after the required information.

Note: It has been requested that a note concerning the number of significant figures which are reliable(since we are recording scaled integers) be added. This note should be contained in the header segment, after the required information.

2.3 The number of lines specified in the header should include any blank lines up to the beginning of data.

2.4 Required header information should appear in the order outlined below.

Note: The line numbers are really record numbers since for a large number of variables the scale factors and/or missing values may require more than one line but are read as one record.

Line 1. Number of lines in the header (including any blank lines).
Line 2. Experimenter name (last name first).
Line 3. Disk number; total disks for this flight (separated by a blank).
Line 4. Mission name.
Line 5. Date, entered as: YY MM DD (separated by a blank).
Line 6. Mission flight number; Lockheed sortie number (separated by

a blank).
Line 7. Number of variables (Nv).
Line 8. Data sample interval, delta t, in seconds.
Line 9. Number of samples per time hack.
Line 10. Number of samples per line.
Line 11. Nv scale factor(s) for converting to engineering units (on one line separated by blanks). The scale factor is the number by which one multiplies the integers on the disk file to obtain actual engineering units.
Line 12. Nv missing value(s) for each recorded variable; this should be a number made up of as many 9's as it takes to fill the data field (on one line separated by blanks). The missing values should be larger than any good data values.
Line 13. Name var(1); eng units var(1).
Line 13+1 Name var(2); eng units var(2).
Line 13+2 Name var(3); eng units var(3).
.
.
.
Line 13+(Nv-1). Name var(Nv); eng units var(Nv).

Total number of required lines in the header = 13+(Nv-1). Additional comments may follow the required lines.

3. Data Format

3.1 All data recorded as integer; the time hack can be written as integer or real, depending on the experimenter's need for specifying the exact time of the measurement.

3.2 Time in GMT elapsed time, cumulative across midnight.

3.3 All data or data blocks are time tagged.

3.4 Time gaps have data field filled with 9's.

3.5 Data organization options.

3.5.1 Time hack on each line (record) followed by data values at that time, as follows:

```
time(1) A(1) [ B(1) C(1) ]
time(2) A(2) [ B(2) C(2) ]
time(3) A(3) [ B(3) C(3) ]
```

3.5.2 Time hack on separate line followed by block of samples whose first value pertains to time hack. If multiple variables in this option, the blocks are ordered by variable.

For single variable:

```
time(1)
A(1) A(2) A(3) A(4)
A(5) A(6) A(7) A(8)
time(9)
A(9)  A(10) A(11) A(12)
A(13) A(14) A(15) A(16)
```

For multiple variables:

```
time(1)
A(1) A(2) A(3) A(4)
A(5) A(6) A(7) A(8)
```

```
B(1) B(2) B(3) B(4)
B(5) B(6) B(7) B(8)
time(9)
A(9)  A(10) A(11) A(12)
A(13) A(14) A(15) A(16)
B(9)  B(10) B(11) B(12)
B(13) B(14) B(15) B(16)
```

4. Examples For File Headers

4.1 Two examples of file headers are given below. The line numbers enclosed by square brackets are only for comparison with the header specifications given in section 2.4 and should not be included in the exchange files. The second example shows that comments may be included, if desired, after the required information.

Header example 1:

```
[ 1]  14
[ 2]  Proffitt, Mike
[ 3]  1 1
[ 4]  STEP Cloud 9
[ 5]  87 01 31
[ 6]  9 101
[ 7]  1
[ 8]  1.0
[ 9]  100
[10]  10
[11]  1.0
[12]  999999
[13]  Ozone ppbv
[14]  This data is perfect.
            .
            .
            DATA
            .
            .
```

Header example 2:

```
[ 1]  15 lines in the header
[ 2]  Scott, Stan  NASA Ames Research Center
[ 3]  1 2  (disk 1 of 2)
[ 4]  STEP Cloud 9
[ 5]  87 01 31  (year month day)
[ 6]  9 101 (STEP flt no./Lockheed sortie no.)
[ 7]  3 variables per sample
[ 8]  1.0 sec data sample interval
[ 9]  1 sample per time hack
[10]  1 sample per line
[11]  0.1 0.1 0.1  (scale factors)
[12]  99999 9999 9999 (missing values)
[13]  Pressure mb
[14]  Temperature K
[15]  True Airspeed m/s
            .
            .
            DATA
            .
            .
```