DORIS Data Format
Version 1.0 (April 1992)
Standard Exchange Format for Range-Rate Observations

Columns	Subset	Description
1-7		Satellite identification
8-9		Measurement type 34 = USB doppler 38 = Tranet doppler 39 = DORIS doppler (up link, on-board receiver)
10-11		Time system indicators
	10	0 = ground received time 1 = satellite transponder/transmitter time 2 = ground transmitted time 3 = satellite received time
	11	0 = UT0 1 = UT1 2 = UT2 3 = UTC (USNO) 4 = A-1 (USNO) 5 = TAI (BIH) 6 = A-S (Smithsonian) 7 = UTC (BIH) 8 = GPS 9 = station dependent correction required
12-16		Station ID
17-32		Time observation (beginning of count)
	17-18	Year minus 1900
	19-21	Day of year (January 1 = Day 1)
	22-26	Seconds from midnight
	27-32	Fractional part of seconds (microseconds)

33-35		Preprocessing indicators
	33	0 = ionosphere correction applied 1 = ionosphere correction not applied
	34	0 = troposphere correction applied 1 = troposphere correction not applied
	35	0 = point considered to be good 1 = point edited during pre-processing 2 = point edited during post-processing
36-45		Count interval (0.1 microseconds)
46-56		Range-rate (micrometers/second)
57-66		Meteorological data
	57-60	Surface pressure (millibars)
	61-63	Surface temperature (degrees Kelvin)
	64-66	Relative humidity (percent)
67-72		Observation standard deviation (micrometers/second)
73-80		Ionospheric refraction correction (micrometers/second)
81-87		Tropospheric refraction correction (micrometers/second)
88-90		Meteorological data source, beacon type
91-96		Center-of-mass correction (micrometers/second) including both effects: satellite and beacon

Specifications on the DORIS data format:

- 299792458 meters/second should be used to convert frequency into meters.

- Time for DORIS = beginning of count interval

- Meteorological data source
    - 1 = measured parameter
    - 2 = pressure from a model
    - 3 = temperature from a model
    - 4 = pressure and temperature from a model
    - 5 = humidity from a model
    - 6 = pressure and humidity from a model
    - 8 = temperature and humidity from a model
    - 9 = pressure, temperature, and humidity from a model

- Beacon location
    - 1 = laboratory
    - 2 = field
    - 3 = other

- Beacon type
    - 2 = tracking beacon

  Only data from tracking beacons are provided.

- Range-rate has been computed using the following equation:

$$V(r) = c/f(bea)[(f(bea)-f(sat))-D/dt]$$

with V(r) = range-rate (meters/second)

dt = count interval (seconds)

D = cycle count

c = 299792458 (meters/second)

and our best estimate of the actual f(bea) (beacon frequency) and f(sat) (satellite frequency)

All corrections (ionosphere, troposphere, and center of mass) should be added to observed values or subtracted from computed values