

## C. UF Format

### C.1 Introduction

UF (short for “Universal Format”) is a radar data format originally proposed and documented in the “Report on a Meeting to Establish a Common Doppler Radar Data Exchange Format”, page 1401 of the November 1980 *Bulletin of the American Meteorological Society*.

### C.2 Single UF Ray Structure

The data consists of a single file for a complete volume scan. Within this file are a series of stand-alone rays (data acquired for a given pointing direction). All header information is duplicated for each ray. Within a ray, the data is basically all organized as 16-bit words, byte swapped in the big endian convention. The exception to this is that each ray starts and ends with a 32-bit record size indicating the number of bytes in the ray. All ASCII text is supposed to be left justified, space padded but some converter programs produce null terminated text, so the reader must be tollerant. The data format does support breaking a large ray into several records. In this case, the multiple records within the ray will have identical formats, they will have different field headers and data fields. The IRIS convertor programs do not support this feature, and will always place a ray in a single record.

Please look in our uf.h header file for additional documentation. These structure names generally end with a “2” to indicate that they are 2-byte aligned. The default is that all IRIS structures are 4-byte aligned unless they end in a 2 or 8.

ray size 4 Bytes
<uf_mandatory_header2> 45 Words
<uf_data_header2> 3 + 2N Words
<uf_field_header2>#1 25 Words
data from field #1 M Words
<uf_field_header2>#2 25 Words
data from field #2 M Words

...(repeats for each data type)...
ray size 4 Bytes

### C.3 uf\_mandatory\_header2 Structure

Source: **uf.h**

Byte	Size	Contents
0	char[2]	Text "UF"
2	SINT2	Record Size in 16-bit words
4	SINT2	Offset to start of optional header, origin 1
6	SINT2	Local-Use Header Position
8	SINT2	Data Header Position
10	SINT2	Record Number
12	SINT2	Volume number on tape, n/a for disk
14	SINT2	Ray number within the volume scan
16	SINT2	Record number within ray (origin 1)
18	SINT2	Sweep number within the volume scan
20	char[8]	Radar name
28	char[8]	site name
36	SINT2	Latitude degrees (North positive, South negative)
38	SINT2	Latitude minutes
40	SINT2	Latitude seconds*64
42	SINT2	Longitude degrees (East positive, West negative)
44	SINT2	Longitude Minutes
46	SINT2	Longitude Seconds
48	SINT2	Height of antenna above sea level in meters
50	SINT2	Year (time of data acquisition)
52	SINT2	Month
54	SINT2	Day
56	SINT2	Hour
58	SINT2	Minute
60	SINT2	Second
62	char[2]	Time zone, "UT" for universal
64	SINT2	Azimuth (degrees*64) of midpoint of sample
66	SINT2	Elevation (degrees*64)
68	SINT2	Sweep mode: 0:Cal 1:PPI 2:Coplane 3:RHI 4:Vertical 5:Target 6:Manual 7:Idle
70	SINT2	Fixed angle (degrees*64)
72	SINT2	Sweep rate ((degrees/second)*64)
74	SINT2	Year (generation data of UF format)
76	SINT2	Month

78	SINT2	Day
80	char[8]	Name of UF generator program
88	SINT2	Value stored for deleted or missing data (0x8000)

## C.4 uf\_optional\_header Structure

Source: **uf.h**

Byte	Size	Contents
0	char[8]	sProjectName[8]
8	SINT2	iBaselineAzimuth
10	SINT2	iBaselineelevation
12	SINT2	iVolumeScanHour /* Time of start of current volume scan */
14	SINT2	iVolumeScanMinute
16	SINT2	iVolumeScanSecond
18	char[8]	sFieldTapeName[8]
24	SINT2	iFlag

## C.5 uf\_data\_header2 Structure

Source: **uf.h**

Byte	Size	Contents
0	SINT2	Number of fields in this ray
2	SINT2	Number of records in this ray
4	SINT2	Number of fields in this record
6	SINT2	Data type of field #1 (SIGMET standard): VR:velocity                      SW:spectrum width      DR:ZDR CZ:Corrected dBZ      DZ:Total dBZ              RH:RhoHV PH:PhiDP                      KD:KDP                      LH:LdrH LV:LdrV
8	SINT2	Field #1 field header position
10	SINT2	Data type of field #2
12	SINT2	Field #2 field header position
...		

## C.6 uf\_field\_header2 Structure

Source: **uf.h**

Byte	Size	Contents
0	SINT2	Data offset from start of record, origin 1
2	SINT2	Scale factor, met units = file value/scale
4	SINT2	Start range km
6	SINT2	Start range meters

8	SINT2	Bin spacing in meters
10	SINT2	Bin count
12	SINT2	Pulse width in meters
14	SINT2	Horizontal beam width in degrees*64
16	SINT2	Vertical beam width in degrees*64
18	SINT2	Receiver bandwidth in Mhz*64 ?
20	SINT2	Polarization: 1:horz 2:vert 3:circular 4:ellip.
22	SINT2	Wave length in cm*64
24	SINT2	Sample size
26	char[2]	Type of data used to threshold
28	SINT2	Threshold value
30	SINT2	Scale
32	char[2]	EditCode
34	SINT2	PRT in microseconds
36	SINT2	Bits per bin, must be 16
38	12	<uf_fsi2>

## C.7 uf\_fsi2 Structure

Source: **uf.h**

Byte	Size	Contents
If velocity data:		
0	SINT2	Nyquist velocity
2	SINT2	<spare>
If DM data:		
0	SINT2	Radar Constant
2	SINT2	Noise Power
4	SINT2	Receiver Gain
6	SINT2	Peak Power
8	SINT2	Antenna Gain
10	SINT2	Pulse Duration (microseconds*64)