2022 HFP: Updates

- **8 Sept: Harris-ELTA provided "lab files" attempting to address deficiencies HRD identified in 20220719I1 CfRadials**
  - **Conclusion: Most important request still not implemented properly** *X*

HWX

```
byte DBZ(time, range) ;
        DBZ:long_name = "DBZ" ;
        DBZ:_fillValue = -9999.f ;
        DBZ:units = "dB" ;
        DBZ:coordinate = "time range" ;
        DBZ:grid_mapping = "grid_mapping" ;
```

NAW

```
byte DBZ(time, range) ;
        DBZ:_fillValue = -9999.f ;
        DBZ:sampling_ratio = 1.f ;
        DBZ:units = "dB " ;
        DBZ:long_name = "DBZ" ;
        DBZ:add_offset = 0.f ;
        DBZ:scale_factor = 0.375f ;
        DBZ:coordinate = "time range" ;
        DBZ:grid_mapping = "grid_mapping" ;
```

CfRadial 1.3 requires scale_factor and add_offset attributes if values stored in byte format:

Float DBZ = (byte DBZ value) * scale_factor + add_offset

1) Scale_factor, add_offset should be attributes of DBZ
2) Scale_factor = 1.0, add_offset = 0.0 would seem to be the appropriate values based on a look at 20220719I1 data

Because MMR processing doesn't appear to flag low SNR regions (as other research radars do), instead reporting a min value of 0 dB for weak (<0 dB) echo and noise (<<0 dB), we requested (for HWX & NAW):

DBZ:comment = "**Reflectivity less than 0 dB has been assigned a value of 0 dB**"

2022 HFP: Updates

➢ MMR "lab file" Update

- **Were other requests implemented properly?**

```
float radar_beam_width_h ;
        radar_beam_width_h:long_name = "half_power_radar_beam_width_h_channel" ;
        radar_beam_width_h:units = "degrees" ;
        radar_beam_width_h:_fillValue = -9999.f ;
        radar_beam_width_h:meta_group = "radar_parameters" ;
float radar_beam_width_v ;
        radar_beam_width_v:long_name = "half_power_radar_beam_width_v_channel" ;
        radar_beam_width_v:units = "degrees" ;
        radar_beam_width_v:_fillValue = -9999.f ;
        radar_beam_width_v:meta_group = "radar_parameters" ;
```

Requested: horizontal/vertical beam width variables with proper values

- radar_beam_width_v = 5.6 ✓
- radar_beam_width_h = 1.4 ✓
- radar_beam_width_v/h attributes are now correct ✓

Requested: standard variable names DBZ and VEL ✓

Note: NAW reflectivity variable is now also called DBZ (but it has 4 values within 1-deg azimuth, then a .5-deg jump)

Requested: Nyquist velocity variable contain proper value

- nyquist_velocity = 6.8703645 ✓

Requested: beam azimuth and elevation clarified as aircraft-relative or earth-relative ✓ →

```
float rotation(time) ;
        rotation:long_name = "ray_rotation_angle_relative_to_platform" ;
        rotation:units = "degrees" ;
        rotation:_FillValue = -9999.f ;
float tilt(time) ;
        tilt:long_name = "ray_tilt_angle_relative_to_platform" ;
        tilt:units = "degrees" ;
        tilt:_FillValue = -9999.f ;
float azimuth(time) ;
        azimuth:standard_name = "ray_azimuth_angle" ;
        azimuth:long_name = "azimuth_angle_from_true_north" ;
        azimuth:units = "degrees" ;
        azimuth:axis = "radial_azimuth_coordinate" ;
        azimuth:_FillValue = -9999.f ;
float elevation(time) ;
        elevation:standard_name = "ray_elevation_angle" ;
        elevation:long_name = "elevation_angle_from_horizontal_plane" ;
        elevation:units = "degrees" ;
        elevation:axis = "radial_elevation_coordinate" ;
        elevation:_FillValue = -9999.f ;
```

Requested: clarification on why _FillValue = -9999.f if that value is never used! ✗

2022 HFP: Updates

➢ MMR "lab file" Update

- **Cannot assess remaining issues below w/o in-flight data**

Requested: variables northward_wind, etc. be populated with correct values from the INU

- northward_wind, eastward_wind, vertical_wind empty *X*
- heading_rate, pitch_rate, roll_rate populated (need to verify values) ?

Requested: proper range and range to center of first gate information ?

```
float range(range) ;
        range:standard_name = "projection_range_coordinate" ;
        range:long_name = "Range_from_instrument_to_center_of_gate" ;
        range:units = "meters" ;
        range:spacing_is_constant = "true" ;
        range:axis = "radial_range_coordinate" ;
        range:meters_to_center_of_first_gate = 40 ;
        range:meters_between_gates = 119 ;
        range:num_of_range_cells = 1312 ;
```

```
range = 40.47, 160.38, 280.29, 400.2, 520.11, 640.02, 759.93, 879.84,
   999.75, 1119.66, 1239.57, 1359.48, 1479.39, 1599.3, 1719.21, 1839.12,
   1959.03, 2078.94, 2198.85, 2318.76, 2438.67, 2558.58, 2678.49, 2798.4,
```

HWX

Try: Compare distance to cell in image with reported range

```
float range(range) ;
        range:standard_name = "projection_range_coordinate" ;
        range:long_name = "Range_from_instrument_to_center_of_gate" ;
        range:units = "meters" ;
        range:spacing_is_constant = "true" ;
        range:axis = "radial_range_coordinate" ;
        range:meters_to_center_of_first_gate = -29 ;
        range:meters_between_gates = 149 ;
        range:num_of_range_cells = 1296 ;
```

```
range = -29.5, 120.39, 270.28, 420.17, 570.06, 719.95, 869.84, 1019.73,
   1169.62, 1319.51, 1469.4, 1619.29, 1769.18, 1919.07, 2068.96, 2218.85,
   2368.74, 2518.63, 2668.52, 2818.41, 2968.3, 3118.19, 3268.08, 3417.97,
```

NAW

X Final FYI: Something is *wrong* with **VEL**! Values are mostly 0 with **pos. integer** values [1,2,3,4,5,6] up to the Nyquist velocity.