Experimental Wind Compression Decision Support Graphic

Part 1 – Mission Connection

1. Product Description: Compression is an Air Traffic Control (ATC) phenomena that occurs when aircraft flying Standard Terminal Arrivals (STARS), usually following one behind the other (nose to tail or in air traffic known as Miles in Trail (MIT)), lose adequate horizontal separation from each other. The phenomenon that creates this is usually a change in wind direction and speed between the two aircraft. Compression can occur when an aircraft, during descent, transitions from a tailwind, or a weak headwind, to a stronger headwind over a small change in altitude. This change could also occur with a heading change of the aircraft during its approach.

2. Purpose/Intended Use: The purpose of the Experimental Wind Compression Graphic is to calculate the likelihood of ATC compression due high wind within the DFW (D10) TRACON for an individual runway on DFW airport. After feedback, the Wind Compression Graphic will be evaluated for National Scope.

3. Audience/Users: Users include: personnel at the Air Traffic Control System Command Center (ATCSCC), FAA ARTCC TMU, TRACON, airline dispatchers, flight service specialists, CWSU meteorologists, airline, corporate, and general aviation pilots.

4. Presentation Format: The product is in a PNG format viewed via as a web page at the following URL: http://www.srh.noaa.gov/images/rtimages/zfw/DFW_Compression.png.
The graphic is annotated highlighting the area of impacted compression shaded red to indicate the altitudes being affected by compression. The next page provides an example of the graphic.

5. Feedback Method/Period: Comments will be compiled and evaluated by the appropriate NWS Aviation Team. Feedback will be obtained through the ZFW web page: sr-zfw.webmaster@noaa.gov and an electronic Survey (http://www.nws.noaa.gov/survey/nws-survey.php?code=WCDSG)

Feedback period will extend from March 2015 through March 2016. After evaluation, feedback, and training, this product may be approved for operational implementation as a national product.

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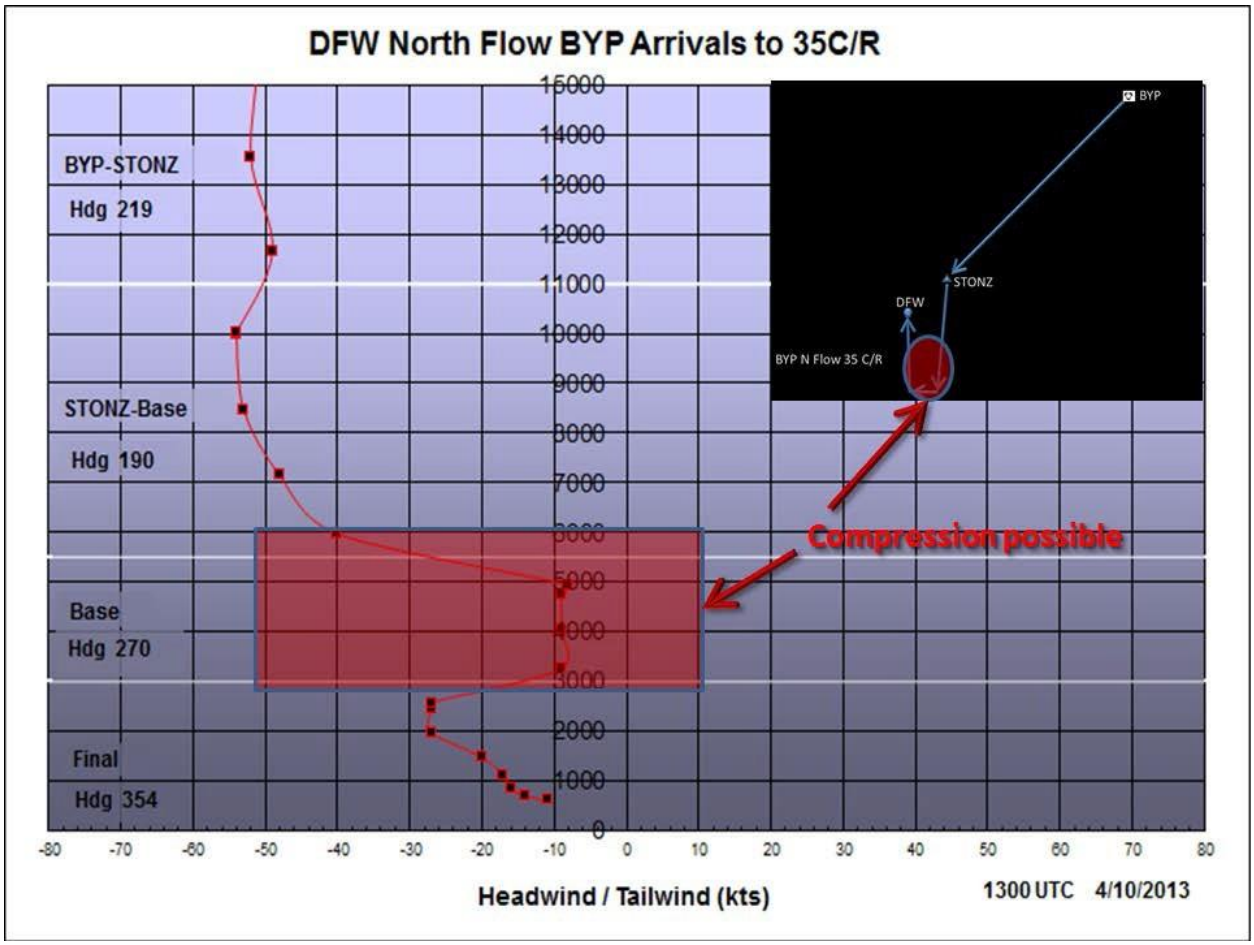

Part 2 – Technical Description

1. Format and Science Basis: Compression values that may impact one TRACON might be different for another TRACON. For DFW TRACON D10, compression becomes a factor when the compression is generally well above 60 kts between reporting points. Compression is as much a function of air traffic as wind. In some cases there may be tremendous compression numbers based on wind only, but without significant air traffic, there is no compression impact and might be irrelevant to ATC. In general this type of situation is encountered overnight when there is generally very little air traffic demand. Compression in the TRACON environment can occur with strong low level winds, possibly associated with a strong low level jet, when there are large changes in wind speed with relatively small changes in altitude. Additionally, it can occur with shallow frontal boundaries, when there are both large changes in wind direction and speed across the frontal boundary. Significant compression values between these different synoptic events may vary.

Compression is limited to aircraft within the TRACON environment. The Wind Compression Decision Support Graphic addresses this atmospheric parameter, and takes a point approach, such as an airport and calculates the headwind and tailwind component as the aircraft descends on the arrival route for approach and landing. The DSS graphic only addresses altitudes between the surface to roughly 11,000 and 15,000 feet as an upper limit, where the aircraft are generally within 50 miles of the airport. The input soundings can either be AMDAR or GSD Model Soundings. The assumption is that the sounding nearest the terminal will generally be representative of the area. Compression usually impacts one side of the TRACON at a time. A representative sounding may be needed from that side to obtain the best results.

The primary data source for sounding analysis comes from AMDAR soundings. Model forecast data from ESRL/GSD can also be used as long as it meets the same format requirements.

Sounding information is obtained from the AMDAR Data Display from password protected, ESRL/GSD web site (http://amdar.noaa.gov/java/). Model sounding data is derived from the ESRL/GSD web site (http://rucsoundings.noaa.gov).

2. Availability: Product is updated 16X7 365 day per year during operational hours of the ZFW CWSU. A web browser is required to view the forecast.

3. Additional Information: N/A