Let’s use this schematic to get a feel for the spatial orientation of the conveyor belts associated with a mature mid-latitude low-pressure system.

The warm conveyor belt is marked in orange. The cold conveyor belt is marked in blue, and the dry conveyor belt is marked in yellow. They’ve been drawn over this satellite image of a mature mid-latitude cyclone. There surface fronts are drawn in, too, so you can get your bearings.

Let’s start with the warm conveyor belt, which transports warm, moist air northward through the warm sector. The warm conveyor belt gradually rises during its northward trek, and notably overruns the cold air north of the warm front, which creates stratiform clouds and precipitation. The western edge of the warm conveyor belt gets drawn a bit westward by the upper-level disturbance that helps spur the low-pressure system, but as it rises to altitudes near 30,000 feet, it usually encounters high-altitude winds from the west, and, in response, turns eastward.

Next, let’s look at the cold conveyor belt, here in blue. The cold conveyor belt is responsible for the westward transport of cool, moist air north of the warm front and back into the cold air west of the low. The cold conveyor belt actually travels under the warm conveyor belt north of a low’s warm front, much like traffic moving under an overpass. As the cold conveyor travels under the warm conveyor belt, it gains some moisture as precipitation evaporates into its westward moving stream of cold air.

The increasingly moist cold conveyor belt starts to rise as it enters the general pattern of strong upward motion around the periphery of the low’s center. This strong ascent continues until the cold conveyor belt reaches the northwest flank of the low, where it often contributes to a swath of heavy precipitation. After reaching the northwest flank of a mature low, the cold conveyor splits into two tributaries. One branch turns clockwise and then heads eastward, while the other branch turns cyclonically as it heads southward, creating the clouds in the comma head of the mature low.

Finally, we have the dry conveyor belt, marked here in yellow. The dry conveyor belt is formed by dry air near the tropopause sinking west of the low’s center It starts to wrap counterclockwise around the low’s periphery, helping to scour out clouds and create the dry slot, west of the cold front, which puts the finishing touches on the overall comma shape of the mass of clouds associated with mature mid-latitude cyclone.