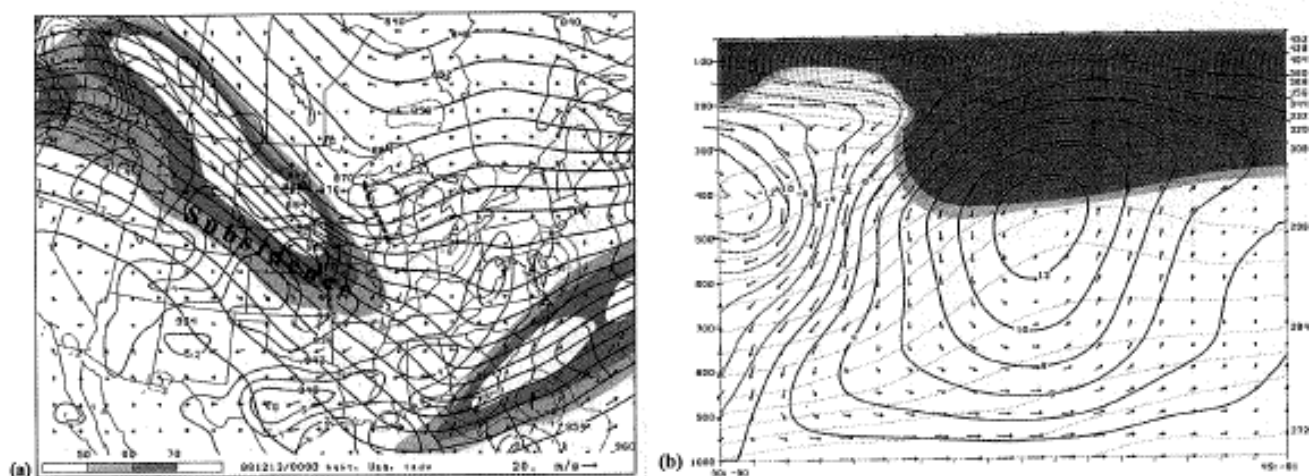
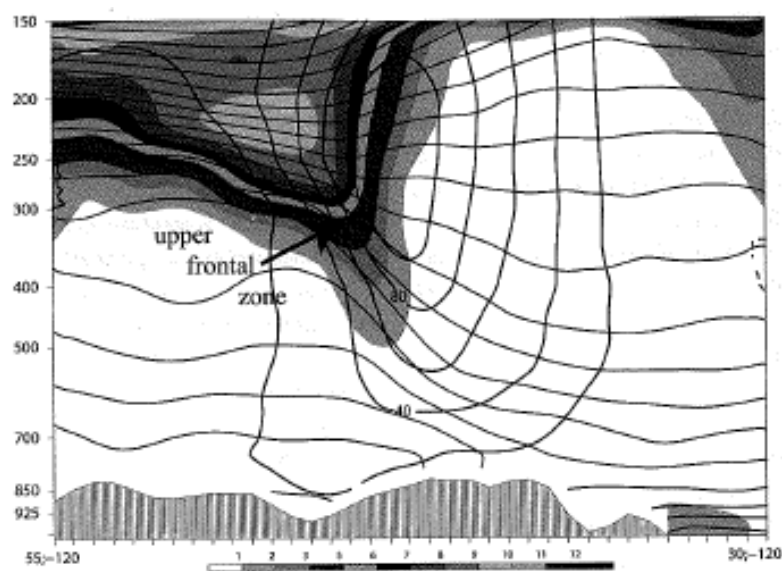


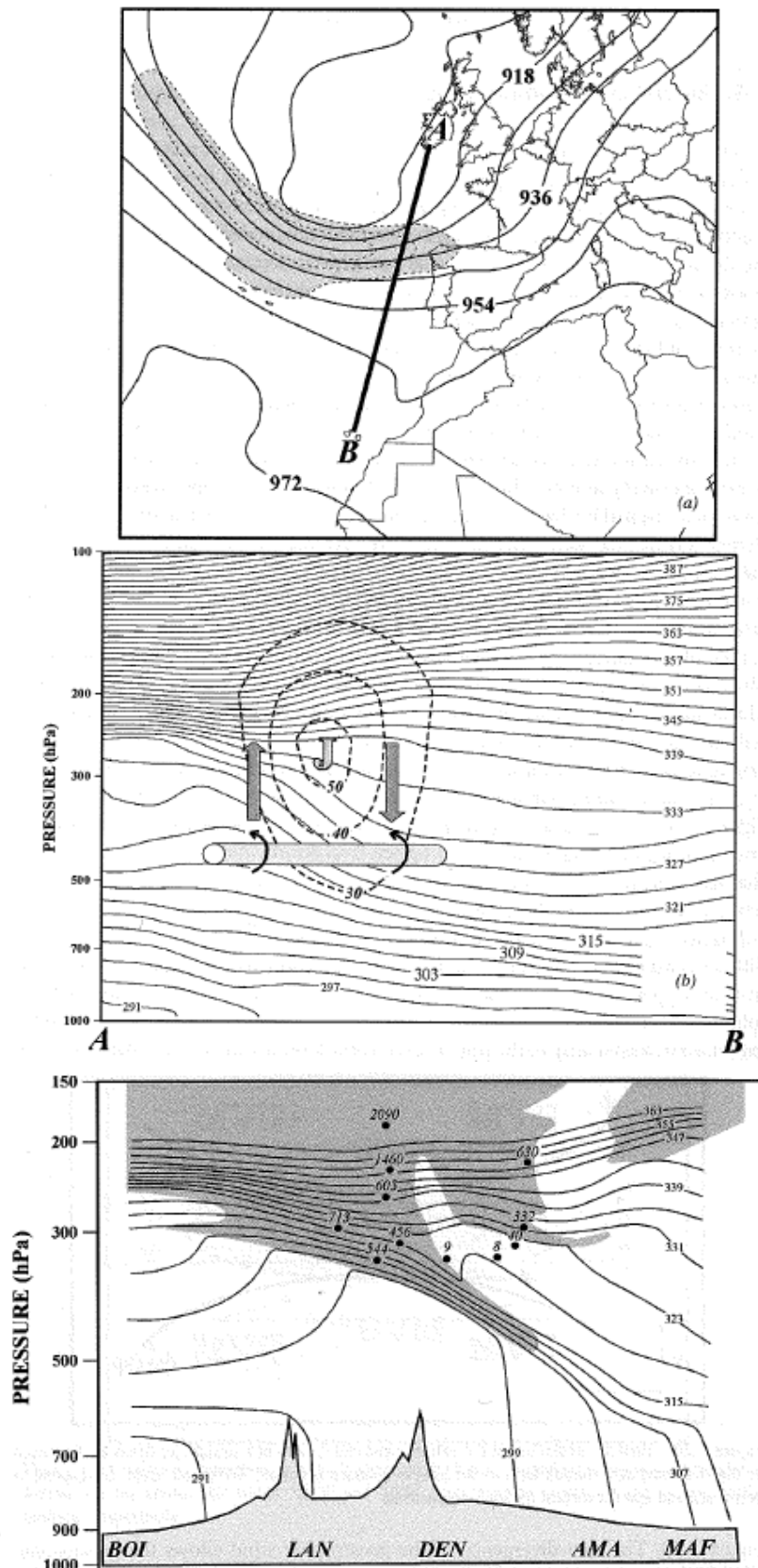
FIG. 1. (a) Cross section of potential temperature (K, solid lines) and wind speed ( $\text{m s}^{-1}$ , dashed lines) at 0000 GMT 17 April 1976. NWS balloon soundings from Winslow, Arizona (INW), Tucson, Arizona (TUS), and Fraccionamiento, Mexico (FRC). Wind flag ( $25 \text{ m s}^{-1}$ ), full wind barb ( $5 \text{ m s}^{-1}$ ), half barb ( $2.5 \text{ m s}^{-1}$ ). Analysis supplemented with NCAR Sabreliner aircraft data in the layer 250–300 mb. (b) Potential vorticity ( $10^{-7} \text{ K mb}^{-1} \text{ s}^{-1}$ )—solid lines for Fig. 1a; dots, intersection of ( $m, \theta$ ) coordinates in Fig. 2b.



**Figure 6.35.** Diagnosis of an upper-level front at 0000 UTC 13 Dec 1988: (a) 300-mb isotachs ( $\text{m s}^{-1}$ , shaded as in legend at bottom of panel), geopotential height (solid contours), vertical motion (thin solid contours: red for descent, blue for ascent), and ageostrophic flow vectors (solid arrows). (b) Ageostrophic streamfunction (solid contours), ageostrophic velocity vectors in plane of section (black arrows), PV (shaded beginning at 1.5 PVU and for 2 PVU) and isentropes (thin dotted lines) (adapted from Lackmann et al. 1997).

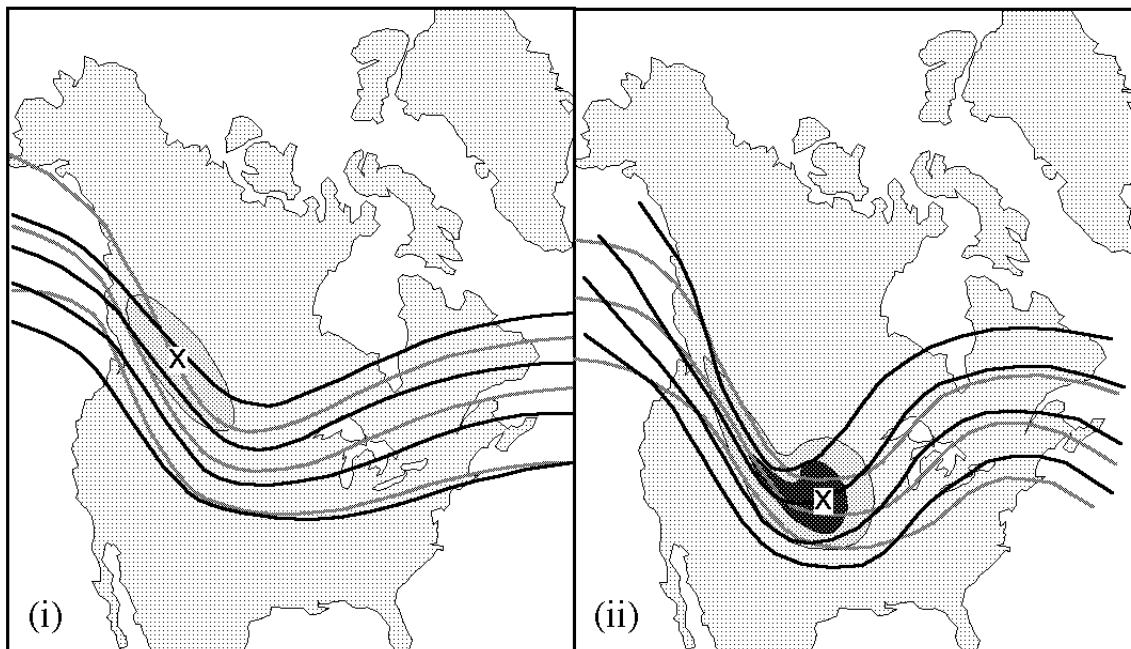


**Figure 6.36.** North-south cross section through an upper-level jet-front system, based on a short-term NAM forecast valid 18 UTC 25 Aug 2004. PV (yellow contours and shaded as in legend at right of panel), isentropes (red solid contours every 5 K), and isotachs (blue contours every 20 kt).



**Figure 7.19** Vertical cross-section taken at 0000 UTC 22 April 1963 from Boise, ID (BOI), to Lander, WY (LAN), to Denver, CO (DEN), to Amarillo, TX (AMA), to Midland, TX (MAF). Solid lines are isentropes labeled in K and contoured every 4 K. Shading highlights regions in which potential vorticity (PV) is greater than or equal to 2.5 PVU ( $1\text{PVU} = 10^{-6}\text{K m}^2\text{kg}^{-1}\text{s}^{-1}$ ) safely indicating stratospheric air. Dots are measurements of radioactive decay of strontium ( $^{90}\text{Sr}$ ) in units of disintegrations per minute per 1000 cubic feet of air. Note the high radioactivity that exists within the high-PV stratospheric air as well as within the upper frontal zone. Adapted from Danielsen (1964)

**b**



**a**

