The rotational spectra of four isotopomers of HCCH-CH₂CF₂ (the most abundant isotopomer, HCCD-CH₂CF₂, DCCD-CH₂CF₂, and H⁻¹³CH⁻¹³CH₂CF₂) have been collected in the 6-18 GHz region with a pulsed molecular beam, Fourier transform microwave spectrometer. The nuclear quadrupole hyperfine structure due to the deuterium nuclei in two of the isotopomers is observed. The spectroscopic constants are consistent with a planar structure in which the primary interaction is between H in HCCH and one of the F atoms in 1,1-difluoroethylene. There is also a secondary interaction between the acetylenic bond and the H atom cis to the F atom involved in the hydrogen bond with HCCH.