The cis,trans isomer of 1,4-difluorobutadiene has been investigated with a pulsed-beam, Fourier transform microwave spectrometer in the spectral range of 5-17 GHz. This molecule is a near-symmetric top with $\kappa = -0.9744$. Sufficient $b$-type and $a$-type transitions for the parent species have been observed to fit a Watson-type Hamiltonian with $A = 12,982.1$, $B = 1467.82$, and $C = 1318.64$ MHz. From a Stark-effect study of three transitions of the parent, the two components of the dipole moment have been determined as $\mu_b = 2.213 (5)$ D and $\mu_a = 0.660 (4)$ D. Fewer transitions have been observed for each of the four different $^{13}C$ isotopomers in natural abundance. Fitting Hamiltonians for the $^{13}C$ isotopomers has required the transfer of some centrifugal distortion constants from the parent. Cartesian coordinates and geometric parameters for the carbon-atom backbone have been found by the substitution method. All the bond angles and bond lengths differ in this planar molecule. Thus, its complete structure is an eighteen-parameter problem. Partially deuterated material has been prepared by isotopic exchange in basic D$_2$O. From a study of this mixture a full structure should be determinable.