Results of laboratory experiments are described in which the motion of a round negatively buoyant jet discharged horizontally into a rotating homogeneous fluid has been investigated. Particle streak and dye photographs are presented (i) to demonstrate the complex three-dimensional flow fields generated by the discharge and (ii) to illustrate how the structure and time development of the flow field is controlled by the momentum (M) and buoyancy (B) fluxes of the discharge, the lateral location y/\omega_0;W of the discharge source from the container wall and the rotation rate \Omega; of the system. The effects of background rotation are studied by contrasting flow patterns for rotating and non-rotating cases, with all other parameters being kept fixed. For cases in which the system is rotating, measurements of momentum-dominated and buoyancy-dominated discharges reveal that the downstream position x_p and streamwise dimension L_p of the primary anticyclonic eddy corner circulation (formed by the deflection to the right of the descending jet) depend primarily upon the dimensionless distance y/\omega_0;W (where W is the width of the channel). The influences of the dimensionless time \Omega;t and the relevant Coriolis parameter M;\Omega;\omega_0;B on x_p and L_p are shown to be relatively weak. The counterpart dimensions L_s and x_s of the secondary cyclonic eddy (generated by the shear associated with (i) the primary eddy and (ii) a boundary current formed along the right side wall of the channel) increase with time. Both dimensions are shown to scale satisfactorily with the inertial scale u_0/\omega_0;\Omega; and the buoyancy\omega_0;\Omega; scale g\prime;\omega_0;\Omega;^2, where u_0 and g\prime; are the source discharge velocity and the modified gravitational acceleration, respectively. The speed u_N of the nose of the wall boundary current is shown to be determined primarily by the dimensionless parameter M;\Omega;\omega_0;B; for values of M;\Omega;\omega_0;B greater than about 5, the quantity u_N is determined primarily by the discharge velocity at the source. For values of M;\Omega;\omega_0;B less than about 5, the dimensionless nose velocity u_N;\Omega;\omega_0;g\prime; increases monotonically with increasing M;\Omega;\omega_0;B for all values of y/\omega_0;W.