OPERATION PRINCIPLES OF VIBRATING GYROS A gyroscope follows Newton s laws of motion, the first of which states that, in order to change the velocity vector of a moving mass, the application of a force is required. The second law states that the greater a mass the more resistant it is to change its velocity vector. A gyroscope is thus constructed by taking a body and suspending it about its center of mass in a frictionless support that allows for three degrees of angular freedom while having three degrees of constraint(ie. for linear motion); such a device can therefore provide information about the angular orientation of its frame with respect to its moving mass. Gyroscopes can be classified in three basic types: a) Spinning mass is the classical gyroscope that has a mass spinning steadily with free movable axis(so called gimbal). When the gyro is tilted, the gyroscopic effect causes precession motion orthogonal to the direction tilt sense) on the rotating mass axis, hence a change in angle can be detected b) optical: lets laser ray reflect around many times within the enclosure. If the enclosure rotates, the duration between the emission of the laser to eventual reception will be different. The laser go-around can be done by mirrors inside the enclosure or by a coil of optical fiber c) vibrating Gyroscope: here a vibrating element, when rotated, is subjected to the Coriolis effect that causes secondary vibration orthogonal to the original vibrating direction. By sensing the secondary vibration, the rate oftum can be detected. All vibrating gyroscopes rely on the phenomenon of the Coriolis acceleration. This acceleration is experienced by a body undergoing linear motion in a frame of reference that is rotating about an axis perpendicular to that of the linear motion. The resulting acceleration, which is directly proportional to the rate of turn, occurs in the third axis that is perpendicular to the plane containing the other two axe