HELICOPTER DESIGN

and

DATA BOOK

by

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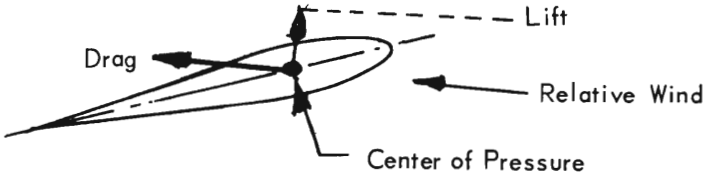
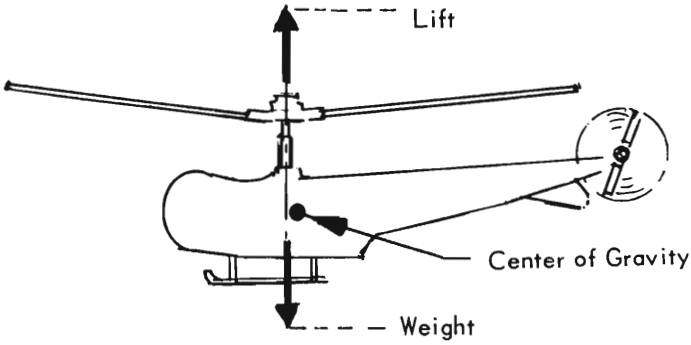
G. DRAG – The force which tends to resist an airfoil's passage through the air. Drag is always parallel to relative wind and perpendicular to lift. Drag varies as the square of the velocity.

H. LIFT – The force produced by an airfoil that is perpendicular of the relative wind. (The vertical component of the resultant vector is that which opposes gravity).

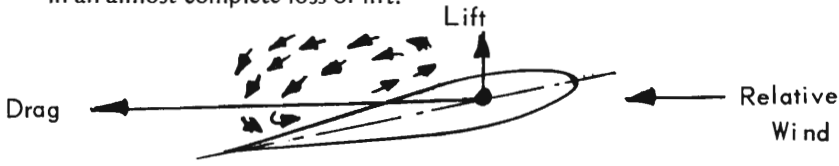


I. THRUST – The force applied to a body tending to motivate the body through the air, thus overcoming drag. (This term implies thrust in a horizontal direction).

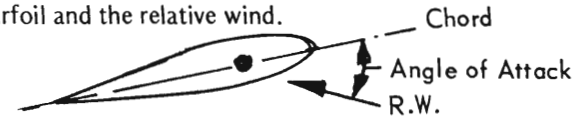
J. CENTER OF GRAVITY – An imaginary point in a body where the resultant of all forces of gravity is considered concentrated.



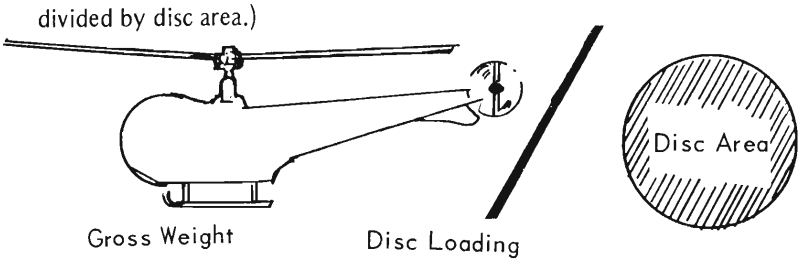
K. STALL – The condition under which the streamline flow of air separates from the top camber of the airfoil and a reverse flow occurs, resulting in an almost complete loss of lift.



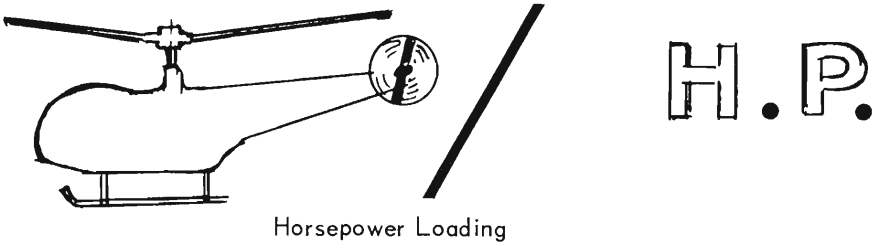
L. ANGLE OF ATTACK – The acute angle between the chord line of an airfoil and the relative wind.



M. DISC LOADING – Is the ratio of gross weight to disc area. (gross weight divided by disc area.)

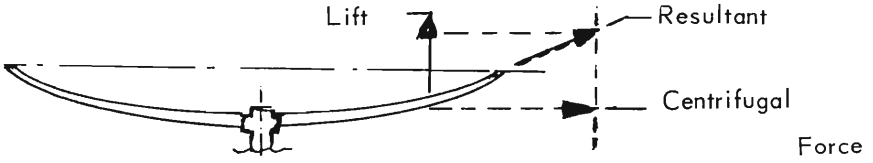


N. HORSEPOWER LOADING – Is the ratio of gross weight to horsepower. (Gross weight divided by horsepower.)

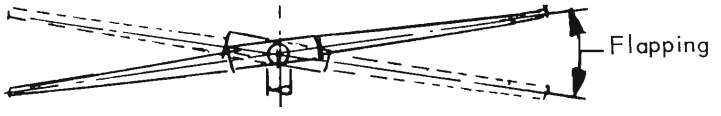


O. SOLIDITY – Is the ratio of blade area to disc area. (Blade area divided by disc area)

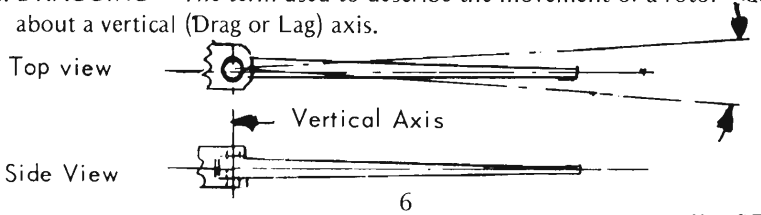
P. CONING – The upward flexing of the rotor blades resulting from the combined effects of centrifugal force and lift.



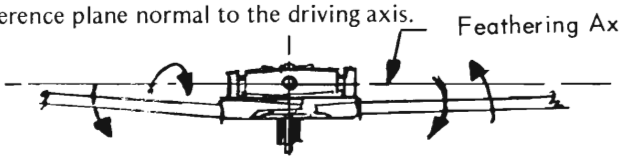
Q. FLAPPING – The term used to describe the angular movement of a rotor blade about a horizontal (flapping) axis. (Usually this axis is nearly chordwise with respect to the rotor blade.)



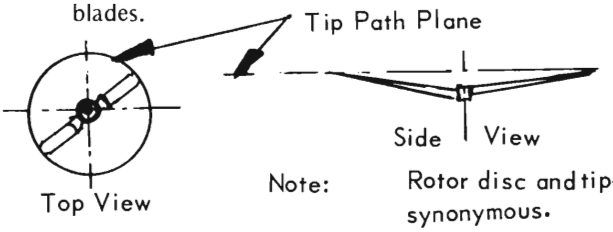
R. DRAGGING – The term used to describe the movement of a rotor blade about a vertical (Drag or Lag) axis.



S. CYCLIC FEATHERING – A term applied to the mechanical rocking of the main rotor hub and blades about the spanwise axis. (Note) a Common Definition for most rotor systems – The diametrically opposite and simultaneous change of blade angle, measured between the chord line and a reference plane normal to the driving axis.

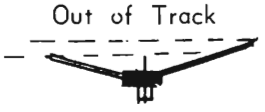


T. TIP – PATH – PLANE – The tip-path-plane is the imaginary circular surface formed by a plane passed through the average tip-path of the rotor blades.

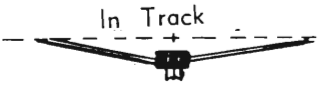


Note: Rotor disc and tip-path plane are considered synonymous.

U. TRACKING – A term denoting the satisfactory relationship of the rotor blades to each other under dynamic flight conditions. This relationship is usually established when the blade tips rotate in a common plane. (However, the word "Tracking" connotes through usage the mechanical procedure used to bring the blades to the above satisfactory flight condition.)



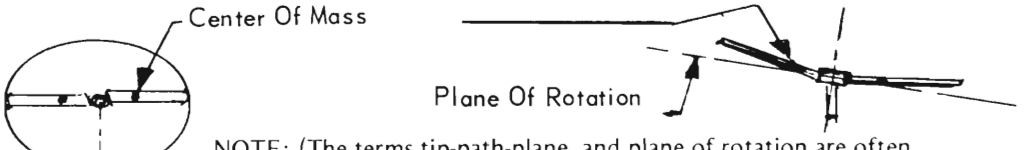
Tips rotate in Different Planes



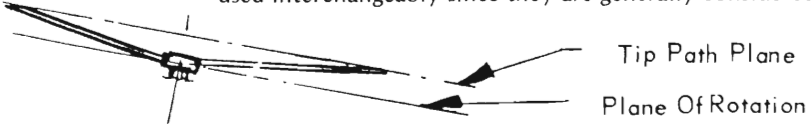
Tips Rotate in Common Plane

V. AXIS OF ROTATION – An imaginary line about which a body rotates.

W. PLANE OF ROTATION – A plane normal to the axis of rotation containing the center of mass of the rotating body.



NOTE: (The terms tip-path-plane, and plane of rotation are often used interchangeably since they are generally considered parallel)



X. TWIST – Rotor blades are sometimes twisted from root to tip in order to achieve a more even distribution of lift along the span.