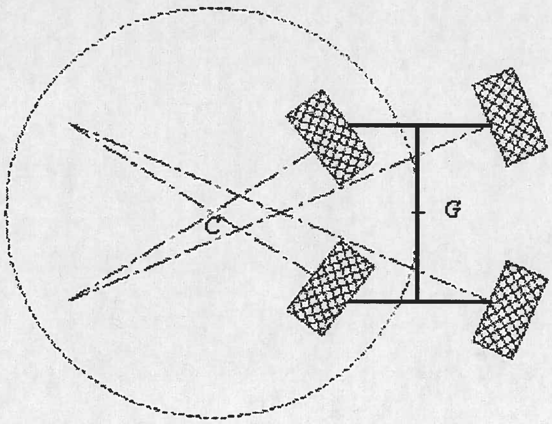
Geometric model of the CyCab[tm]

Dual drive mode (front and rear guiding wheels)
In this mode, both rear and front wheels are used to steer the CyCab[tm]. The same angle "alfa" is given to the rear and front inner turning wheels (see [Fig. 2]). In "single" drive mode, you can guess, as it is depicted in [Fig. 1], that all the perpendiculars to wheels sides, converge in the same point *C* (which is in a matter of fact the bending center). Now, in [Fig. 2], the bending center *C* appears to be not accurately defined. In a matter of fact, the point is not unique. That is to say : even if we compute the correct wheels speeds, the steering lock of the outter wheels, will produce a slight skid phenomenon. So, we will determine the position of *C* in order to limit those wheels skids. The center *C*, as depicted in [Fig. 2], corresponds to the best compromise in this case.

Fig. 2 : Principle of the CyCab[tm] "dual drive" navigation mode.



The corresponding computed speeds, are given by the following four equations :

$$V_{LF} = \frac{\sqrt{\left(\frac{R}{2}-\frac{e}{2}\right)^2+\frac{l^2}{4}}\;2|\tan\alpha|}{l}\,V_D$$

$$V_{RF} = \frac{\sqrt{\left(\frac{R}{2}+\frac{e}{2}\right)^2+\frac{l^2}{4}}\;2|\tan\alpha|}{l}\,V_D$$

$$V_{LR} = \frac{\sqrt{\left(\frac{R}{2}-\frac{e}{2}\right)^2+\frac{l^2}{4}}\;2|\tan\alpha|}{l}\,V_D$$

$$V_{RR} = \frac{\sqrt{\left(\frac{R}{2}+\frac{e}{2}\right)^2+\frac{l^2}{4}}\;2|\tan\alpha|}{l}\,V_D$$

In this case, let us note that the desired speed V_D, is expressed at the point G in order to be tangent to the trajectory the car follows.

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