GENERAL COMPARISON OF DIRECT AND GEARED DRIVES FOR CONTROL APPLICATIONS

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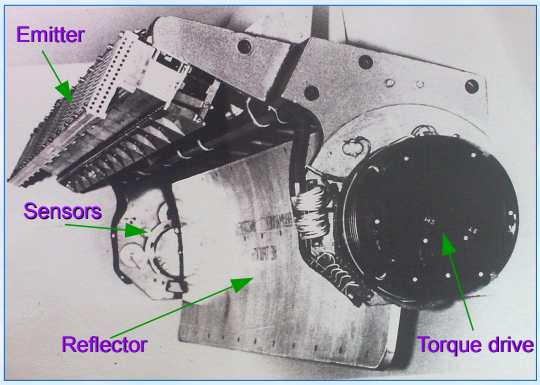

$$\frac{\Omega_L \cdot (i \cdot K)}{U_a} = 1 - \frac{T_L}{I_{a.St} \cdot (i \cdot K)}$$

i, K **- tunable parameters**
K **- motor constant**
i **– gear ratio**

Two alternatives

K → **Direct Drives (DD)**

i,K → **Geared Drives (GD)**

Operation features	**Transfer functions**	**DD's time constants are usually much higher**
	Control system errors	**In DD:** $e_{torque} \gg e_{dynamic}$ **In GD:** $e_{torque} \ll e_{dynamic}$
	Speed ripples	**Speed ripple is less for:** **- DD under high load inertia** **- GD under low load inertia**
	Drive efficiency	**DDs' efficiency is higher, but we should design a new torque motor for every new load specified**
Application features	**Weight and size**	**GDs provide lower dimensions and weight**
	Service life and reliability	**DD's reliability is higher due to the gearbox absence**
	Vibrations and audible noise	**GD produces more noise due to the high motor speed and the gearbox skirr**
	Cost	**DDs: initial price is higher** **GDs: maintenance cost is higher**
	Motor selection procedure base	**DDs: maximum required torque** **GDs: required maximum output power**

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