emitter follower with current source

In its standard version an emitter follower is provided with an emitter resistor. This resistor and the base potential determine the emitter current Ie of the emitter follower. The gain of the emitter follower is always less than unity, but approaches unity as the product $S \cdot Re$ is greater. S is the slope, which equals $40 \cdot Ie$. The product $SRe = 40 IeRe$, and thus the gain, corresponds to a certain base potential.

If Re is replaced by a current source, S can be chosen independently of Re. The value of Re is then determined by the load impedance of the emitter follower which is usually much higher than the value required for the DC-setting. It is now possible to obtain a gain closely approaching unity. This is of import- for certain types of active filter.

circuit has an additional advantage. It can be shown that the distortion of an emitter follower is inversely proportional to the square of the emitter impedance Re. As already said, Re is much higher than usual when a current source is used. Hence distortion, too, is much less than usual. At the indicated value of Re the emitter current is about 2 mA. Reduction of R3 involves a proportional increase in emitter current.