

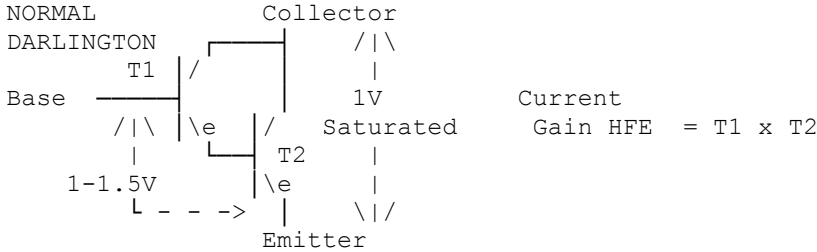
Darlington and Quasi Darlington

By G8MNY

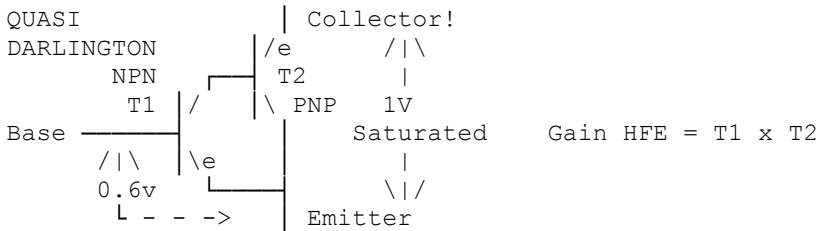
(Updated May 06)

(8 Bit ASCII Graphics use code page 437 or 850)

This simple way to improve the current gain of a transistor just use 2 in cascade, often used in PSU's & AF output stages & even the odd RF signal amp. Two separate devices can be used or in a single package.



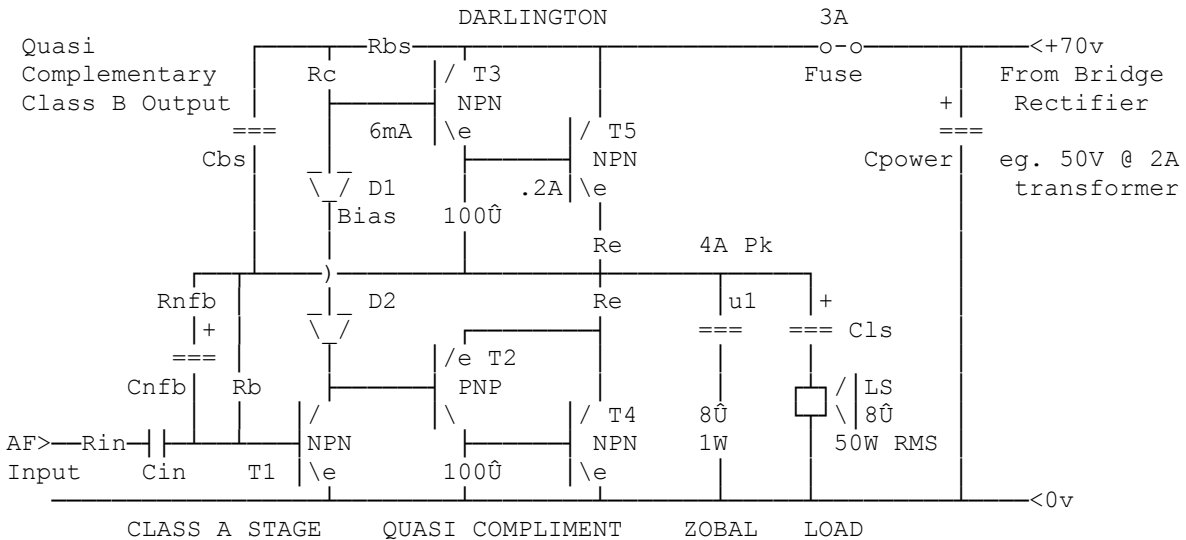
This method has the 2 transistors of the same type, & has the disadvantage of higher bias voltage.



This is often used where T1 is a PNP & T2 is a cheaper high power NPN.

To speed up the 2nd transistor turn off, a low \hat{U} is often used base to emitter in either configuration.

AS USED IN A PUSH PULL AMP



COMPONENT VALUES

Input Z = Rin, eg. 10k

XCin = Rin @ 10Hz, eg. 2uF

Rb sets 35V on the O/P, $((Rc+Rs) \times T1Hfe)$, eg. 330k

Gain = $(Rnfb//Rb)/Rin$, eg. 10x = 150k

XCnfb = Rnfb @ < 10Hz, eg. 1uF

T1= 100mA 100v 100x 1W

T2 & T3 = 1A 100V 30x 5W, eg. TIP29/30

T4 & T5 = 15A 100V 20x 115W on heatsink, eg. 2N3055

100 Ω in T4 & 5 base-emitter, ensure they turn off properly.

D1 & D2 drop the 1.3V needed to just under bias the O/Ps, eg. 1N4148

Re maintain thermal stability, e.g. 0.22 Ω 2W

Rc sets the peak +ve O/P current (eg. $\frac{1}{2} \times LS \times T5Hfe \times T3Hfe$) eg. 2k2 2W

Cbs & Rbs make a bootstrap to maintain current through Rc.

Rbs = Rc/2 eg. 1k 1W

XCbs = Rbs @ < 10Hz eg. 30uF @ 50V

XCls = LS @ < 10Hz eg. 1000uF @ 50V

XCpower = LS @ < 20Hz, assuming 100Hz supply from bridge, e.g. 4700uF @ 80V

Zobal network keeps the O/P terminated at HF when the LS is O/C, for stability.

In practice there would be more gain stages in front providing 3V RMS & more N.F.B. for lower distortion, but this circuit should work OK.

Why don't U send an interesting bul?

73 De John, G8MNY @ GB7CIP