Notes on push-pull complimentary stage

- "complimentary" = both npn & pnp used
- "push-pull" only one transistor is ON (active), the other is OFF
- this is class B amplifier

- Note: both transistors cannot have forward biased base-emitter simultaneously: $V_{be1} = V_{be2} = V_{in} - V_{out}$ b/c they are complementary

- $G \approx 1$ for volt., can have $G \gg 1$ for current

< Lab Manual , Fig 6.36

Note: there will be no cross-over distortions if no load is attached.

Q: why? A: no current can flow thru both $Q_1, Q_2$ , => $I_e = 0$, $V_{be} = 0$

with load:

- the current flows in the direction of emitter arrows for half the cycle, the other transistor is OFF
Push-pull amp with negative feedback to fix cross-over dist.

- basic idea: eliminate 0.6V diode drop using negative feedback

Lab Manual, Fig 6.37 Exp. 6.10

Steps to understanding this circuit:

1) negative feedback keeps $V_- = V_+$

2) when $V_m > 0$, the current flows to the right across $R_3, R_4$, and $Q_2$ is ON

3) when $V_m < 0$, the current flows to the left thru $R_3, R_4$, and $Q_1$ is ON

In both cases $V_{out} = -R_4 \cdot I = -R_4 \frac{V_m}{R_3}$

i.e. $V_d$ does not come into the expression