EFFECT OF THE DIODE FORWARD VOLTAGE DROP:

\[ V_0 = U_2 - V_D \]

THE USE OF OP-AMPS FOR RECTIFICATION - "THE SUPER-DIODE"

\[ A_V \neq \infty \]

\[ U_0 = VA - V_D \]

\[ VA = A_V \times (U_2 - U_0) \]

\[ U_0 = A_V (U_2 - U_0) - V_D \]
\[ V_o (1+Av) = Av V_i - V_d \]

\[ \Rightarrow V_o = \frac{Av}{1+Av} V_i - \frac{V_d}{1+Av} \]

As \( Av \to \infty \), \( V_o = V_i \)

**PRINCIPLE:**

![Diagram showing a circuit with input \( V_i \), output \( V_o \), feedback loop, and unwanted signal.]
"PRECISION DIODE - PRACTICAL OP-AMP"

RECTIFIER:

In the previous CFI the loop is open for \( V_I < 0 \).

\[ V_I < 0 \quad V_A > 0 \Rightarrow D1 \text{ on, } D2 \text{ off} \]

\[ V_0 = V_A - V_{ON} = -A_u V_I - V_{ON} \]

\[ V_I = \frac{R_2}{R_1 + R_2} V_I + \frac{R_1}{R_1 + R_2} V_0 \]
\[ U_0 = -A_I \left( \frac{R_2}{R_1+R_2} U_I + \frac{R_1}{R_1+R_2} U_0 \right) - V_{on} \]

\[ U_0 \left\{ 1 + \frac{A_I R_1}{R_1+R_2} \right\} = -A_I \frac{R_2}{R_1+R_2} U_I - V_{on} \]

\[ U_0 = \left( -A_I \frac{R_2}{R_1+R_2} \right) U_I - \frac{V_{on}}{1 + \frac{A_I R_1}{R_1+R_2}} \]

\[ \lim_{A_I \to 0} \frac{U_0}{U_I} = -\frac{R_2}{R_1} U_I \]