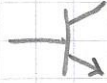


# SINGLE BIPOLAR TRANSISTOR AMPLIFIER TYPES

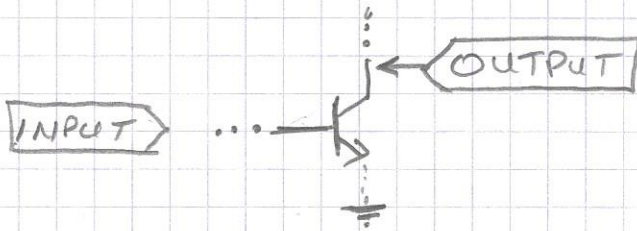


- ① - Common Emitter
- ② - Common Collector
- ③ - Common Base

- DEFINITION
- CONFIGURATION
- BASIC CHARACTERISTICS
- TYPICAL USES

# ① COMMON EMITTER

- MOST COMMON TYPE OF G.P. AMPLIFIER

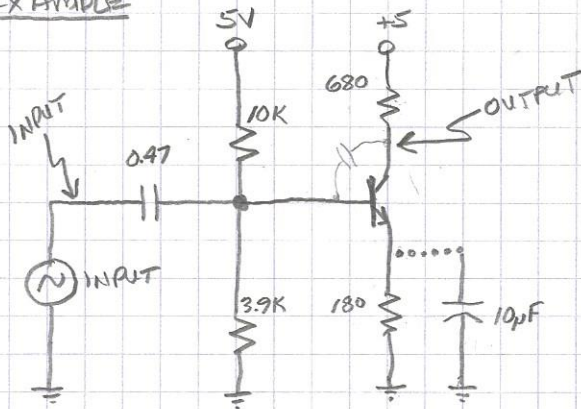


- INPUT SIGNAL CONNECTED TO BASE
- OUTPUT TAKEN FROM COLLECTOR

## FEATURES

- MODERATE / HIGH INPUT IMPEDANCE
- MODERATE OUTPUT IMPEDANCE
- HIGH VOLTAGE GAIN
- HIGH CURRENT GAIN

## EXAMPLE



- OUTPUT IS INVERTED

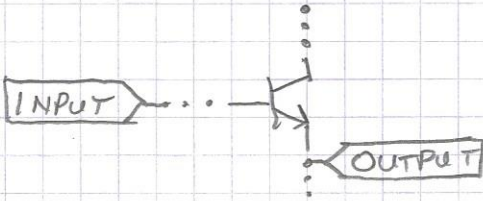
- MOST COMMON AMPLIFIER FOR MANY APPLICATIONS

$$r_e = g_m = \frac{V_T}{I_c} \approx \frac{26\text{mV}}{I_c}$$

$$A_v \approx \frac{R_c}{r_e + R_E} \quad (g_m R_c)$$

## ② COMMON COLLECTOR

- ALSO CALLED EMITTER FOLLOWER

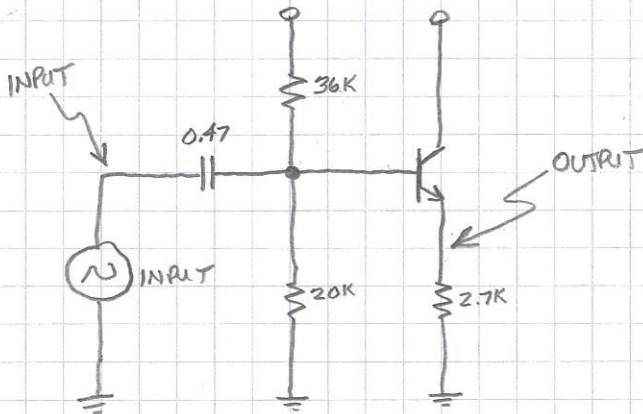


- INPUT CONNECTED TO BASE
- OUTPUT FROM EMITTER

### FEATURES

- MODERATE / HIGH INPUT IMPEDANCE
- LOW OUTPUT IMPEDANCE
- LOW (UNITY) VOLTAGE GAIN
- HIGH CURRENT GAIN

### EXAMPLE

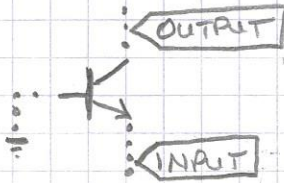


- MOST OFTEN  
USED AS  
A BUFFER

- EASILY DRIVES  
VARIOUS LOADS

### ③ COMMON BASE

- LEAST COMMON, GOOD FOR RF, HIGH FREQUENCY

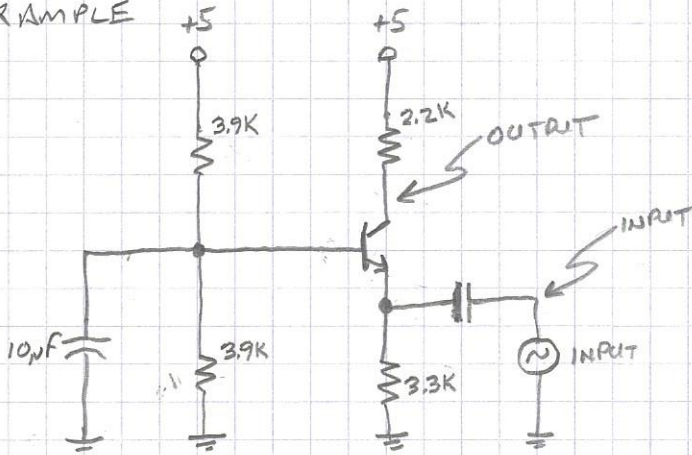


- INPUT CONNECTED TO EMITTER
- OUTPUT TAKEN FROM COLLECTOR

#### FEATURES

- LOW INPUT IMPEDANCE
- MODERATE / HIGH OUTPUT IMPEDANCE
- HIGH VOLTAGE GAIN
- $\approx$  UNITY CURRENT GAIN

#### EXAMPLE



- RF AMPLIFIERS