

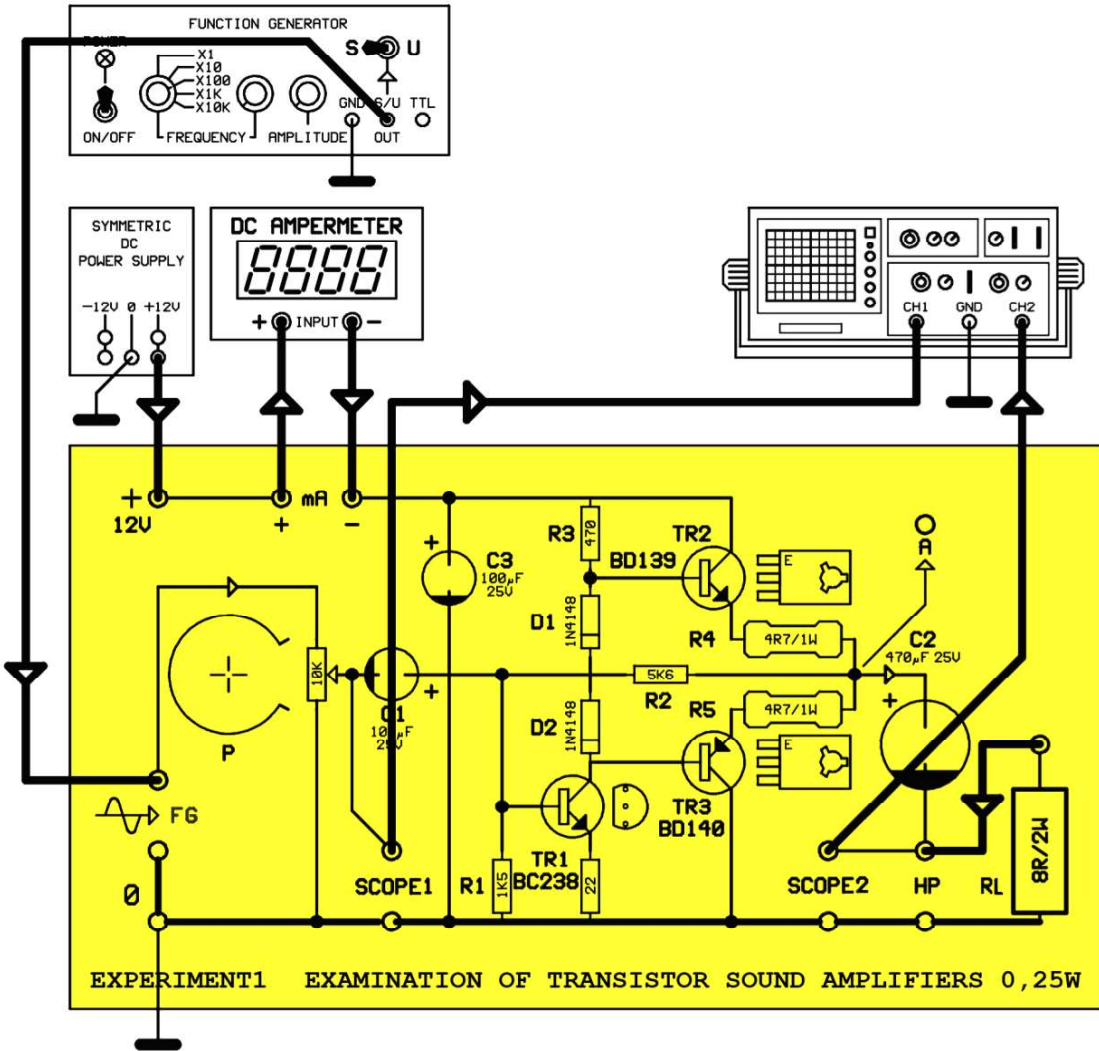
# EXPERIMENT 7.1

## EXAMINATION OF TRANSISTOR SOUND AMPLIFIERS

**EXPERIMENT PROCEDURE:**

**1-** Put Y-0016/011 module in place. Connect the circuit shown in Figure 7.1.

**Note:** 8R/2W resistor on the module will be used as speaker.



**Figure 7.1**

**2-** Adjust potentiometer P to maximum condition (**middle pin on top**). Only apply power to the function generator. Adjust the output of function generator to Scop1, sinusoidal signal with frequency 1 KHz and amplitude peak-peak **V<sub>ipp</sub>=1V**olt .Adjust potentiometer "P" to minimum condition (**middle pin on bottom**).

**3-** Power on the sound amplifier. Measure the current drawn by sound amplifier. What is this current's definition and why?

**4-** Adjust the P potentiometer to obtain maximum distortion-free amplitude at Scop2. Measure the current drawn by sound amplifier. What is this current and why? Evaluate the value in terms of efficiency.

**5-** Measure the input and output signal amplitude when the output signal have distortion-free maximum amplitude value. Evaluate the voltage gain of the sound amplifier.

Input signal peak-peak **V<sub>ipp</sub>**=.....Volt.  
 Output signal peak-peak **V<sub>opp</sub>**=.....Volt.  
 Voltage gain (**A**);  

$$A = 20Lg. \frac{V_o}{V_i} =$$
  
 A = .....dB

**6-** Evaluate the output power of the sound amplifier (**P**).

Output signal peak-peak **V<sub>opp</sub>**=.....Volt.  
 Maximum output voltage  

$$E_{max} = \frac{V_{opp}}{2} = .....Volt$$
  
 Effective output voltage (**E**);  
 E=E<sub>max</sub>.0,707=.....Volt  
 Output power (**P**);  

$$P = \frac{E^2}{Z} = .....Watt$$
  

**Note:** Z is the speaker impedance, where we used RY load resistance in the circuit, which is RL=8Ω.

7- For the values in table of Figure 7.2 measure and note output voltage (**V<sub>opp</sub>**) for all steps.

V <sub>i<sub>pp</sub></sub> =500mV CONSTANT			V <sub>i<sub>pp</sub></sub> =500mV CONSTANT		
NUMBER	FREQUENCY	V <sub>opp</sub> (V)	NUMBER	FREQUENCY	V <sub>opp</sub> (V)
1	20 Hz		7	3 KHz	
2	50 Hz		8	4 KHz	
3	100 Hz		9	5 KHz	
4	500 Hz		10	10 KHz	
5	1 KHz		11	15 KHz	
6	2 KHz		12	20 KHz	

Figure 7.2

8- Based on your measurements in Figure 7.2, plot the frequency characteristic of the sound amplifier using the output voltage values.

